Vincotech

# 10-PY07BVA030RW-LF42E28Y
datasheet

***flow*SOL 1 BI (TL)** **650 V / 30 A**

## Topology features

- Kelvin Emitter for improved switching performance
- Temperature sensor
- Booster + H6.5

## Component features

- High efficiency in hard switching and resonant topologies
- High speed switching
- Low gate charge

## Housing features

- Base isolation: $Al_2O_3$
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief
- Press-fit pin
- Reliable cold welding connection

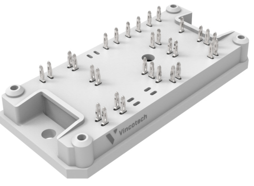
## Target applications

- Solar Inverters

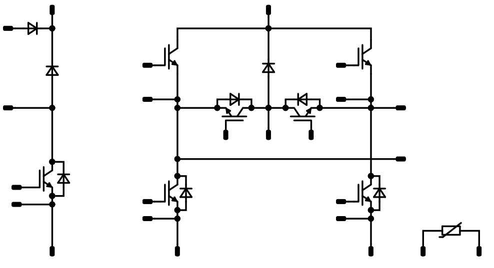
## Types

- 10-PY07BVA030RW-LF42E28Y

## *flow* 1 12 mm housing



## Schematic



# Maximum Ratings

$T_j$ = 25 °C, unless otherwise specified

| Parameter | Symbol | Conditions | | Value | Unit |
|---|---|---|---|---|---|
| **Low Buck Switch** | | | | | |
| Collector-emitter voltage | $V_{CES}$ | | | 650 | V |
| Collector current (DC current) | $I_C$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 36 | A |
| Repetitive peak collector current | $I_{CRM}$ | $t_p$ limited by $T_{jmax}$ | | 120 | A |
| Total power dissipation | $P_{tot}$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 63 | W |
| Gate-emitter voltage | $V_{GES}$ | | | ±30 | V |
| Maximum junction temperature | $T_{jmax}$ | | | 175 | °C |
| **High Buck Switch** | | | | | |
| Collector-emitter voltage | $V_{CES}$ | | | 650 | V |
| Collector current (DC current) | $I_C$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 36 | A |
| Repetitive peak collector current | $I_{CRM}$ | $t_p$ limited by $T_{jmax}$ | | 120 | A |
| Total power dissipation | $P_{tot}$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 63 | W |
| Gate-emitter voltage | $V_{GES}$ | | | ±30 | V |
| Maximum junction temperature | $T_{jmax}$ | | | 175 | °C |
| **Buck Diode** | | | | | |
| Peak repetitive reverse voltage | $V_{RRM}$ | | | 650 | V |
| Forward current (DC current) | $I_F$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 29 | A |
| Repetitive peak forward current | $I_{FRM}$ | $t_p$ limited by $T_{jmax}$ | | 40 | A |
| Total power dissipation | $P_{tot}$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 51 | W |
| Maximum junction temperature | $T_{jmax}$ | | | 175 | °C |

# Maximum Ratings

$T_j$ = 25 °C, unless otherwise specified

| Parameter | Symbol | Conditions | | Value | Unit |
|---|---|---|---|---|---|
| **Boost Switch** | | | | | |
| Collector-emitter voltage | $V_{CES}$ | | | 650 | V |
| Collector current (DC current) | $I_C$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 28 | A |
| Repetitive peak collector current | $I_{CRM}$ | $t_p$ limited by $T_{jmax}$ | | 60 | A |
| Turn off safe operating area | | $T_j$ = 150°C, $V_{CE}$ = 1200 V | | 60 | A |
| Total power dissipation | $P_{tot}$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 59 | W |
| Gate-emitter voltage | $V_{GES}$ | | | ±20 | V |
| Short circuit ratings | $t_{SC}$ | $V_{GE}$ = 15 V, $V_{CC}$ = 360 V | $T_j$ = 150 °C | 6 | µs |
| Maximum junction temperature | $T_{jmax}$ | | | 175 | °C |
| **Low Boost Diode** | | | | | |
| Peak repetitive reverse voltage | $V_{RRM}$ | | | 650 | V |
| Forward current (DC current) | $I_F$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 29 | A |
| Repetitive peak forward current | $I_{FRM}$ | $t_p$ limited by $T_{jmax}$ | | 40 | A |
| Total power dissipation | $P_{tot}$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 51 | W |
| Maximum junction temperature | $T_{jmax}$ | | | 175 | °C |
| **High Boost Diode** | | | | | |
| Peak repetitive reverse voltage | $V_{RRM}$ | | | 650 | V |
| Forward current (DC current) | $I_F$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 29 | A |
| Repetitive peak forward current | $I_{FRM}$ | $t_p$ limited by $T_{jmax}$ | | 40 | A |
| Total power dissipation | $P_{tot}$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 51 | W |
| Maximum junction temperature | $T_{jmax}$ | | | 175 | °C |

# Maximum Ratings

$T_j$ = 25 °C, unless otherwise specified

| Parameter | Symbol | Conditions | | Value | Unit |
|---|---|---|---|---|---|
| **Input Boost Switch** | | | | | |
| Collector-emitter voltage | $V_{CES}$ | | | 650 | V |
| Collector current (DC current) | $I_C$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 36 | A |
| Repetitive peak collector current | $I_{CRM}$ | $t_p$ limited by $T_{jmax}$ | | 120 | A |
| Total power dissipation | $P_{tot}$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 63 | W |
| Gate-emitter voltage | $V_{GES}$ | | | ±30 | V |
| Maximum junction temperature | $T_{jmax}$ | | | 175 | °C |
| **Input Boost Diode** | | | | | |
| Peak repetitive reverse voltage | $V_{RRM}$ | | | 650 | V |
| Forward current (DC current) | $I_F$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 34 | A |
| Repetitive peak forward current | $I_{FRM}$ | $t_p$ limited by $T_{jmax}$ | | 60 | A |
| Total power dissipation | $P_{tot}$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 50 | W |
| Maximum junction temperature | $T_{jmax}$ | | | 175 | °C |
| **Input Boost Sw. Protection Diode** | | | | | |
| Peak repetitive reverse voltage | $V_{RRM}$ | | | 650 | V |
| Forward current (DC current) | $I_F$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 17 | A |
| Repetitive peak forward current | $I_{FRM}$ | $t_p$ limited by $T_{jmax}$ | | 20 | A |
| Total power dissipation | $P_{tot}$ | $T_j = T_{jmax}$ | $T_s$ = 80 °C | 33 | W |
| Maximum junction temperature | $T_{jmax}$ | | | 175 | °C |

# Maximum Ratings

$T_j$ = 25 °C, unless otherwise specified

| Parameter | Symbol | Conditions | | Value | Unit |
|---|---|---|---|---|---|
| **ByPass Diode** | | | | | |
| Peak repetitive reverse voltage | $V_{RRM}$ | | | 1600 | V |
| Forward current (DC current) | $I_F$ | $T_j$ = $T_{jmax}$ | $T_s$ = 80 °C | 46 | A |
| Surge (non-repetitive) forward current | $I_{FSM}$ | Single Half Sine Wave, $t_p$ = 10 ms | $T_j$ = 150 °C | 270 | A |
| Surge current capability | $I^2t$ | | | 370 | $A^2s$ |
| Total power dissipation | $P_{tot}$ | $T_j$ = $T_{jmax}$ | $T_s$ = 80 °C | 56 | W |
| Maximum junction temperature | $T_{jmax}$ | | | 150 | °C |
| **Module Properties** | | | | | |
| **Thermal Properties** | | | | | |
| Storage temperature | $T_{stg}$ | | | -40…+125 | °C |
| Operation temperature under switching condition | $T_{jop}$ | | | -40…+($T_{jmax}$ - 25) | °C |
| **Isolation Properties** | | | | | |
| Isolation voltage | $V_{isol}$ | DC Test Voltage* | $t_p$ = 2 s | 6000 | V |
| Isolation voltage | $V_{isol}$ | AC Voltage | $t_p$ = 1 min | 2500 | V |
| Creepage distance | | | | >12,7 | mm |
| Clearance | | | | 7,93 | mm |
| Comparative Tracking Index | CTI | | | ≥ 200 | |

*100 % tested in production

# Characteristic Values

| Parameter | Symbol | Conditions | $V_{GE}$ [V] $V_{GS}$ [V] | $V_{CE}$ [V] $V_{DS}$ [V] $V_F$ [V] | $I_C$ [A] $I_D$ [A] $I_F$ [A] | $T_j$ [°C] | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Low Buck Switch** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Gate-emitter threshold voltage | $V_{GE(th)}$ | | | 5 | 0,02 | 25 | 5 | 6 | 7 | V |
| Collector-emitter saturation voltage | $V_{CEsat}$ | | 15 | | 30 | 25<br>125<br>150 | | 1,44<br>1,61<br>1,64 | 1,9(1) | V |
| Collector-emitter cut-off current | $I_{CES}$ | | 0 | 650 | | 25 | | | 0,01 | mA |
| Gate-emitter leakage current | $I_{GES}$ | | 30 | 0 | | 25 | | | 0,2 | µA |
| Internal gate resistance | $r_g$ | | | | | | | None | | Ω |
| Input capacitance | $C_{ies}$ | $f$ = 1 Mhz | 0 | 30 | | 25 | | 2530 | | pF |
| Output capacitance | $C_{oes}$ | | | | | | | 65 | | pF |
| Reverse transfer capacitance | $C_{res}$ | | | | | | | 46 | | pF |
| Gate charge | $Q_g$ | | 15 | 400 | 30 | 25 | | 84 | | nC |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink (2) | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 1,5 | | K/W |
| **Dynamic** | | | | | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $R_{gon}$ = 8 Ω<br>$R_{goff}$ = 8 Ω | ±15 | 350 | 30 | 25<br>125<br>150 | | 42<br>43<br>43 | | ns |
| Rise time | $t_r$ | | | | | 25<br>125<br>150 | | 7<br>7<br>7 | | ns |
| Turn-off delay time | $t_{d(off)}$ | | | | | 25<br>125<br>150 | | 59<br>67<br>68 | | ns |
| Fall time | $t_f$ | | | | | 25<br>125<br>150 | | 21,64<br>36,5<br>52,33 | | ns |
| Turn-on energy (per pulse) | $E_{on}$ | $Q_{rFWD}$=2,03 µC<br>$Q_{rFWD}$=2,74 µC<br>$Q_{rFWD}$=2,99 µC | | | | 25<br>125<br>150 | | 0,374<br>0,471<br>0,495 | | mWs |
| Turn-off energy (per pulse) | $E_{off}$ | | | | | 25<br>125<br>150 | | 0,256<br>0,387<br>0,441 | | mWs |

# Characteristic Values

| Parameter | Symbol | Conditions | $V_{GE}$ [V] $V_{GS}$ [V] | $V_{CE}$ [V] $V_{DS}$ [V] $V_F$ [V] | $I_C$ [A] $I_D$ [A] $I_F$ [A] | $T_j$ [°C] | Values Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| **High Buck Switch** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Gate-emitter threshold voltage | $V_{GE(th)}$ | | | 5 | 0,02 | 25 | 5 | 6 | 7 | V |
| Collector-emitter saturation voltage | $V_{CEsat}$ | | 15 | | 30 | 25<br>125<br>150 | | 1,44<br>1,61<br>1,64 | 1,9(1) | V |
| Collector-emitter cut-off current | $I_{CES}$ | | 0 | 650 | | 25 | | | 0,01 | mA |
| Gate-emitter leakage current | $I_{GES}$ | | 30 | 0 | | 25 | | | 0,2 | µA |
| Internal gate resistance | $r_g$ | | | | | | | None | | Ω |
| Input capacitance | $C_{ies}$ | $f$ = 1 Mhz | 0 | 30 | | 25 | | 2530 | | pF |
| Output capacitance | $C_{oes}$ | | | | | | | 65 | | pF |
| Reverse transfer capacitance | $C_{res}$ | | | | | | | 46 | | pF |
| Gate charge | $Q_g$ | | 15 | 400 | 30 | 25 | | 84 | | nC |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink (2) | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 1,5 | | K/W |
| **Dynamic** | | | | | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $R_{gon}$ = 8 Ω<br>$R_{goff}$ = 8 Ω | ±15 | 350 | 30 | 25<br>125<br>150 | | 42<br>43<br>43 | | ns |
| Rise time | $t_r$ | | | | | 25<br>125<br>150 | | 7<br>7<br>7 | | ns |
| Turn-off delay time | $t_{d(off)}$ | | | | | 25<br>125<br>150 | | 59<br>67<br>68 | | ns |
| Fall time | $t_f$ | | | | | 25<br>125<br>150 | | 21,64<br>36,5<br>52,33 | | ns |
| Turn-on energy (per pulse) | $E_{on}$ | $Q_{rFWD}$=2,03 µC<br>$Q_{rFWD}$=2,74 µC<br>$Q_{rFWD}$=2,99 µC | | | | 25<br>125<br>150 | | 0,374<br>0,471<br>0,495 | | mWs |
| Turn-off energy (per pulse) | $E_{off}$ | | | | | 25<br>125<br>150 | | 0,256<br>0,387<br>0,441 | | mWs |

## Characteristic Values

| Parameter | Symbol | Conditions | $V_{GE}$ [V] $V_{GS}$ [V] | $V_{CE}$ [V] $V_{DS}$ [V] $V_{F}$ [V] | $I_{C}$ [A] $I_{D}$ [A] $I_{F}$ [A] | $T_{j}$ [°C] | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Buck Diode** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Forward voltage | $V_{F}$ | | | | 20 | 25<br>125<br>150 | | 1,56<br>1,51<br>1,51 | 1,92(1) | V |
| Reverse leakage current | $I_{R}$ | $V_{r}$ = 650 V | | | | 25 | | | 1,28 | µA |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink (2) | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 1,88 | | K/W |
| **Dynamic** | | | | | | | | | | |
| Peak recovery current | $I_{RRM}$ | d*i*/d*t*=6385 A/µs<br>d*i*/d*t*=6312 A/µs<br>d*i*/d*t*=6023 A/µs | ±15 | 350 | 30 | 25<br>125<br>150 | | 69,9<br>76,16<br>78,25 | | A |
| Reverse recovery time | $t_{rr}$ | | | | | 25<br>125<br>150 | | 50,69<br>90,9<br>93,49 | | ns |
| Recovered charge | $Q_{r}$ | | | | | 25<br>125<br>150 | | 2,03<br>2,74<br>2,99 | | µC |
| Reverse recovered energy | $E_{rec}$ | | | | | 25<br>125<br>150 | | 0,532<br>0,69<br>0,751 | | mWs |
| Peak rate of fall of recovery current | $(di_{rf}/dt)_{max}$ | | | | | 25<br>125<br>150 | | 5003<br>5228<br>5263 | | A/µs |

# Characteristic Values

| Parameter | Symbol | Conditions | $V_{GE}$ [V] $V_{GS}$ [V] | $V_{CE}$ [V] $V_{DS}$ [V] $V_F$ [V] | $I_C$ [A] $I_D$ [A] $I_F$ [A] | $T_j$ [°C] | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Boost Switch** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Gate-emitter threshold voltage | $V_{GE(th)}$ | $V_{CE} = V_{GE}$ | | | 0,00029 | 25 | 5,1 | 5,8 | 6,4 | V |
| Collector-emitter saturation voltage | $V_{CEsat}$ | | 15 | | 20 | 25<br>125<br>150 | 1,03 | 1,5<br>1,68<br>1,71 | 1,87(1) | V |
| Collector-emitter cut-off current | $I_{CES}$ | | 0 | 650 | | 25 | | | 1 | μA |
| Gate-emitter leakage current | $I_{GES}$ | | 20 | 0 | | 25 | | | 150 | nA |
| Internal gate resistance | $r_g$ | | | | | | | None | | Ω |
| Input capacitance | $C_{ies}$ | $f$ = 1 Mhz | 0 | 25 | | 25 | | 1100 | | pF |
| Output capacitance | $C_{oes}$ | | | | | | | 71 | | pF |
| Reverse transfer capacitance | $C_{res}$ | | | | | | | 32 | | pF |
| Gate charge | $Q_g$ | $V_{CC}$ = 480 V | 15 | | 20 | 25 | | 120 | | nC |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink (2) | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 1,6 | | K/W |
| **Dynamic** | | | | | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $R_{gon}$ = 16 Ω<br>$R_{goff}$ = 16 Ω | ±15 | 350 | 20 | 25<br>125<br>150 | | 62<br>61<br>61 | | ns |
| Rise time | $t_r$ | | | | | 25<br>125<br>150 | | 22<br>21<br>20 | | ns |
| Turn-off delay time | $t_{d(off)}$ | | | | | 25<br>125<br>150 | | 131<br>150<br>154 | | ns |
| Fall time | $t_f$ | | | | | 25<br>125<br>150 | | 72,1<br>105,2<br>114,85 | | ns |
| Turn-on energy (per pulse) | $E_{on}$ | $Q_{rFWD}$=0,614 μC<br>$Q_{rFWD}$=1,2 μC<br>$Q_{rFWD}$=1,38 μC | | | | 25<br>125<br>150 | | 0,524<br>0,705<br>0,765 | | mWs |
| Turn-off energy (per pulse) | $E_{off}$ | | | | | 25<br>125<br>150 | | 0,431<br>0,607<br>0,643 | | mWs |

# Characteristic Values

| Parameter | Symbol | Conditions | | | | | Values | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $V_{GE}$ [V] $V_{GS}$ [V] | $V_{CE}$ [V] $V_{DS}$ [V] $V_F$ [V] | $I_C$ [A] $I_D$ [A] $I_F$ [A] | $T_j$ [°C] | Min | Typ | Max | |
| **Low Boost Diode** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Forward voltage | $V_F$ | | | | 20 | 25<br>125<br>150 | | 1,56<br>1,51<br>1,51 | 1,92[1] | V |
| Reverse leakage current | $I_R$ | $V_r$ = 650 V | | | | 25 | | | 1,28 | µA |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink [2] | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 1,88 | | K/W |
| **Dynamic** | | | | | | | | | | |
| Peak recovery current | $I_{RRM}$ | d$i$/d$t$=3350 A/µs<br>d$i$/d$t$=868 A/µs<br>d$i$/d$t$=1011 A/µs | ±15 | 350 | 20 | 25<br>125<br>150 | | 12,81<br>17,01<br>17,57 | | A |
| Reverse recovery time | $t_{rr}$ | | | | | 25<br>125<br>150 | | 71,53<br>113,68<br>126,68 | | ns |
| Recovered charge | $Q_r$ | | | | | 25<br>125<br>150 | | 0,614<br>1,2<br>1,38 | | µC |
| Reverse recovered energy | $E_{rec}$ | | | | | 25<br>125<br>150 | | 0,093<br>0,197<br>0,234 | | mWs |
| Peak rate of fall of recovery current | $(di_{rf}/dt)_{max}$ | | | | | 25<br>125<br>150 | | 220,72<br>183,67<br>146,55 | | A/µs |

# Characteristic Values

| Parameter | Symbol | Conditions | | | | | Values | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $V_{GE}$ [V] $V_{GS}$ [V] | $V_{CE}$ [V] $V_{DS}$ [V] $V_F$ [V] | $I_C$ [A] $I_D$ [A] $I_F$ [A] | $T_j$ [°C] | Min | Typ | Max | |
| **High Boost Diode** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Forward voltage | $V_F$ | | | | 20 | 25<br>125<br>150 | | 1,56<br>1,51<br>1,51 | 1,92(1) | V |
| Reverse leakage current | $I_R$ | $V_r$ = 650 V | | | | 25 | | | 1,28 | µA |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink (2) | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 1,88 | | K/W |
| **Dynamic** | | | | | | | | | | |
| Peak recovery current | $I_{RRM}$ | d*i*/d*t*=3350 A/µs<br>d*i*/d*t*=868 A/µs<br>d*i*/d*t*=1011 A/µs | ±15 | 350 | 20 | 25<br>125<br>150 | | 12,81<br>17,01<br>17,57 | | A |
| Reverse recovery time | $t_{rr}$ | | | | | 25<br>125<br>150 | | 71,53<br>113,68<br>126,68 | | ns |
| Recovered charge | $Q_r$ | | | | | 25<br>125<br>150 | | 0,614<br>1,2<br>1,38 | | µC |
| Reverse recovered energy | $E_{rec}$ | | | | | 25<br>125<br>150 | | 0,093<br>0,197<br>0,234 | | mWs |
| Peak rate of fall of recovery current | $(di_{rf}/dt)_{max}$ | | | | | 25<br>125<br>150 | | 220,72<br>183,67<br>146,55 | | A/µs |

# Characteristic Values

| Parameter | Symbol | Conditions | $V_{GE}$ [V] $V_{GS}$ [V] | $V_{CE}$ [V] $V_{DS}$ [V] $V_F$ [V] | $I_C$ [A] $I_D$ [A] $I_F$ [A] | $T_j$ [°C] | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Input Boost Switch** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Gate-emitter threshold voltage | $V_{GE(th)}$ | | | 5 | 0,02 | 25 | 5 | 6 | 7 | V |
| Collector-emitter saturation voltage | $V_{CEsat}$ | | 15 | | 30 | 25<br>125<br>150 | | 1,44<br>1,61<br>1,64 | 1,9(1) | V |
| Collector-emitter cut-off current | $I_{CES}$ | | 0 | 650 | | 25 | | | 0,01 | mA |
| Gate-emitter leakage current | $I_{GES}$ | | 30 | 0 | | 25 | | | 0,2 | µA |
| Internal gate resistance | $r_g$ | | | | | | | None | | Ω |
| Input capacitance | $C_{ies}$ | $f$ = 1 Mhz | 0 | 30 | | 25 | | 2530 | | pF |
| Output capacitance | $C_{oes}$ | | | | | | | 65 | | pF |
| Reverse transfer capacitance | $C_{res}$ | | | | | | | 46 | | pF |
| Gate charge | $Q_g$ | | 15 | 400 | 30 | 25 | | 84 | | nC |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink (2) | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 1,5 | | K/W |
| **Dynamic** | | | | | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $R_{gon}$ = 8 Ω<br>$R_{goff}$ = 8 Ω | 0/15 | 400 | 30 | 25<br>125<br>150 | | 21<br>19<br>19 | | ns |
| Rise time | $t_r$ | | | | | 25<br>125<br>150 | | 8<br>8<br>8 | | ns |
| Turn-off delay time | $t_{d(off)}$ | | | | | 25<br>125<br>150 | | 93<br>106<br>109 | | ns |
| Fall time | $t_f$ | | | | | 25<br>125<br>150 | | 18,35<br>29,84<br>33,52 | | ns |
| Turn-on energy (per pulse) | $E_{on}$ | $Q_{rFWD}$=1,07 µC<br>$Q_{rFWD}$=1,96 µC<br>$Q_{rFWD}$=2,28 µC | | | | 25<br>125<br>150 | | 0,501<br>0,658<br>0,679 | | mWs |
| Turn-off energy (per pulse) | $E_{off}$ | | | | | 25<br>125<br>150 | | 0,295<br>0,45<br>0,468 | | mWs |

# Characteristic Values

| Parameter | Symbol | Conditions | $V_{GE}$ [V] $V_{GS}$ [V] | $V_{CE}$ [V] $V_{DS}$ [V] $V_F$ [V] | $I_C$ [A] $I_D$ [A] $I_F$ [A] | $T_j$ [°C] | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Input Boost Diode** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Forward voltage | $V_F$ | | | | 30 | 25<br>125<br>150 | | 1,52<br>1,46<br>1,43 | 1,92(1) | V |
| Reverse leakage current | $I_R$ | $V_r$ = 650 V | | | | 25 | | | 1,6 | µA |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink (2) | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 1,92 | | K/W |
| **Dynamic** | | | | | | | | | | |
| Peak recovery current | $I_{RRM}$ | d*i*/d*t*=5993 A/µs<br>d*i*/d*t*=5650 A/µs<br>d*i*/d*t*=5315 A/µs | 0/15 | 400 | 30 | 25<br>125<br>150 | | 50,22<br>63,43<br>67,68 | | A |
| Reverse recovery time | $t_{rr}$ | | | | | 25<br>125<br>150 | | 42,3<br>64,99<br>72,95 | | ns |
| Recovered charge | $Q_r$ | | | | | 25<br>125<br>150 | | 1,07<br>1,96<br>2,28 | | µC |
| Reverse recovered energy | $E_{rec}$ | | | | | 25<br>125<br>150 | | 0,292<br>0,553<br>0,654 | | mWs |
| Peak rate of fall of recovery current | $(di_{rf}/dt)_{max}$ | | | | | 25<br>125<br>150 | | 2522<br>1944<br>2299 | | A/µs |

# Characteristic Values

| Parameter | Symbol | Conditions | | | | | Values | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | $V_{GE}$ [V] $V_{GS}$ [V] | $V_{CE}$ [V] $V_{DS}$ [V] $V_F$ [V] | $I_C$ [A] $I_D$ [A] $I_F$ [A] | $T_j$ [°C] | Min | Typ | Max | |
| **Input Boost Sw. Protection Diode** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Forward voltage | $V_F$ | | | | 10 | 25<br>125 | 1,23 | 1,67<br>1,56 | 1,87(1) | V |
| Reverse leakage current | $I_R$ | $V_r$ = 650 V | | | | 25 | | | 0,14 | µA |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink (2) | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 2,87 | | K/W |
| **ByPass Diode** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Forward voltage | $V_F$ | | | | 13 | 25<br>125 | | 0,988<br>0,899 | 1,21(1)<br>1,1(1) | V |
| Reverse leakage current | $I_R$ | $V_r$ = 1600 V | | | | 25 | | | 50 | µA |
| **Thermal** | | | | | | | | | | |
| Thermal resistance junction to sink (2) | $R_{th(j-s)}$ | $\lambda_{paste}$ = 3,4 W/mK (PSX) | | | | | | 1,25 | | K/W |
| **Thermistor** | | | | | | | | | | |
| **Static** | | | | | | | | | | |
| Rated resistance | $R$ | | | | | 25 | | 22 | | kΩ |
| Deviation of $R_{100}$ | $\Delta_{R/R}$ | $R_{100}$ = 1484 Ω | | | | 100 | -5 | | 5 | % |
| Power dissipation | $P$ | | | | | 25 | | 130 | | mW |
| Power dissipation constant | $d$ | | | | | 25 | | 1,5 | | mW/K |
| B-value | $B_{(25/50)}$ | Tol. ±1 % | | | | | | 3962 | | K |
| B-value | $B_{(25/100)}$ | Tol. ±1 % | | | | | | 4000 | | K |
| Vincotech Thermistor Reference | | | | | | | | | I | |

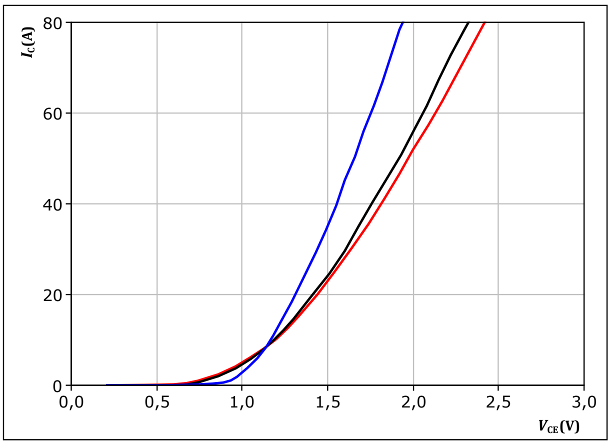
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

# Low Buck Switch Characteristics

**figure 1.** IGBT

**Typical output characteristics**

$I_C = f(V_{CE})$



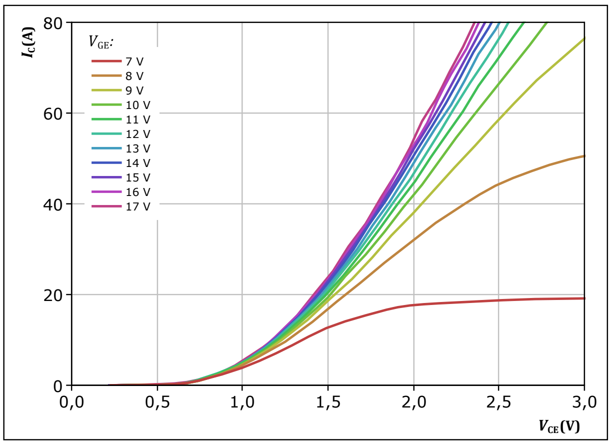

| | | |
|---|---|---|
| $t_p$ = | 250 | μs |
| $V_{GE}$ = | 15 | V |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 2.** IGBT

**Typical output characteristics**

$I_C = f(V_{CE})$



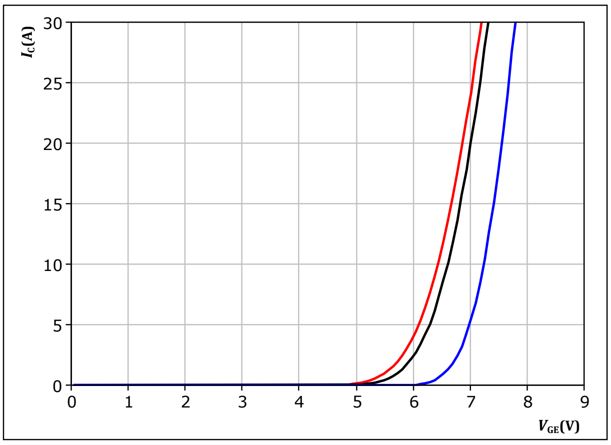

| | | |
|---|---|---|
| $t_p$ = | 250 | μs |
| $T_j$ = | 150 | °C |

$V_{GE}$ from 7 V to 17 V in steps of 1 V

**figure 3.** IGBT

**Typical transfer characteristics**

$I_C = f(V_{GE})$



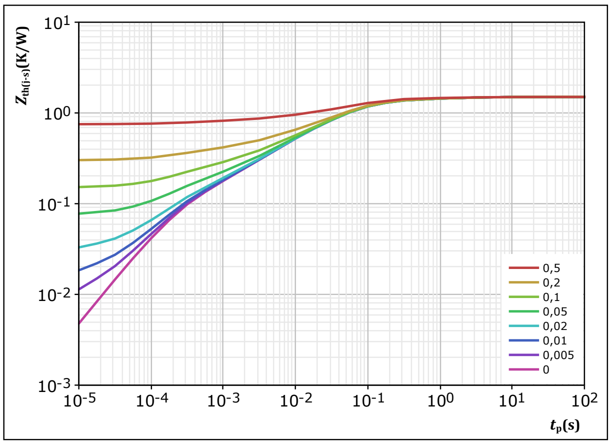

| | | |
|---|---|---|
| $t_p$ = | 250 | μs |
| $V_{CE}$ = | 10 | V |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 4.** IGBT

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)} = f(t_p)$




$D$ = $t_p$ / $T$

$R_{th(j-s)}$ = 1,501 K/W

IGBT thermal model values

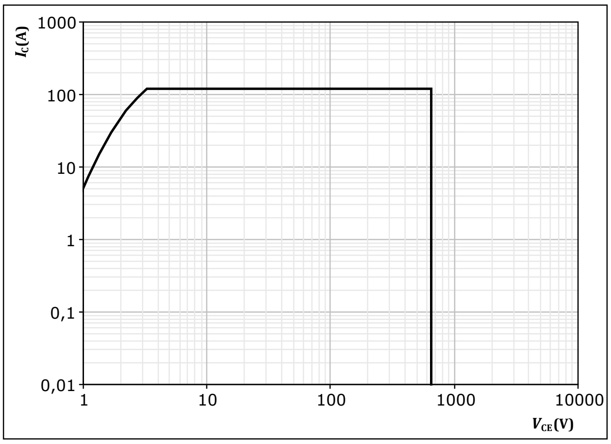
| $R$ (K/W) | $\tau$ (s) |
|---|---|
| 5,92E-02 | 3,33E+00 |
| 1,11E-01 | 5,14E-01 |
| 4,91E-01 | 8,64E-02 |
| 4,45E-01 | 3,10E-02 |
| 2,28E-01 | 6,69E-03 |
| 7,55E-02 | 1,48E-03 |
| 9,11E-02 | 2,40E-04 |

# Low Buck Switch Characteristics

| **figure 5.** | **IGBT** |
|---|---|

**Safe operating area**

$I_C$ = f( $V_{CE}$)



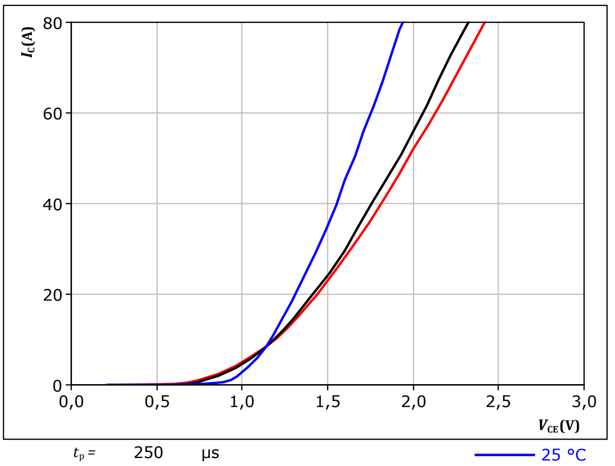

| | | |
|---|---|---|
| $D$ = | single pulse | |
| $T_s$ = | 80 | °C |
| $V_{GE}$ = | 15 | V |
| $T_j$ = | $T_{jmax}$ | |

# High Buck Switch Characteristics

**figure 6.** **IGBT**

**Typical output characteristics**

$I_C$ = f( $V_{CE}$ )

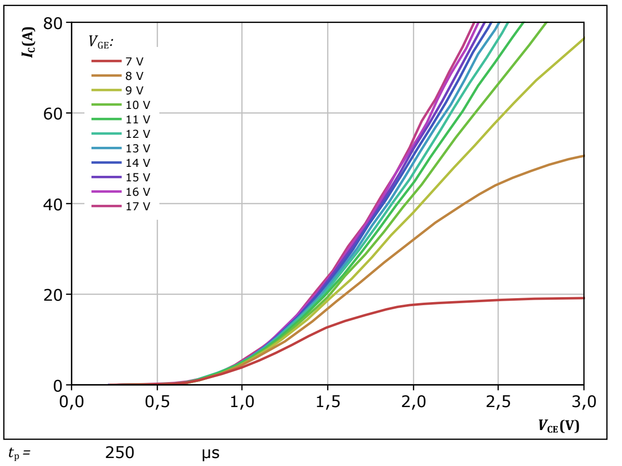



$t_p$ = 250 µs
$V_{GE}$ = 15 V
$T_j$: 25 °C, 125 °C, 150 °C

**figure 7.** **IGBT**

**Typical output characteristics**

$I_C$ = f( $V_{CE}$ )

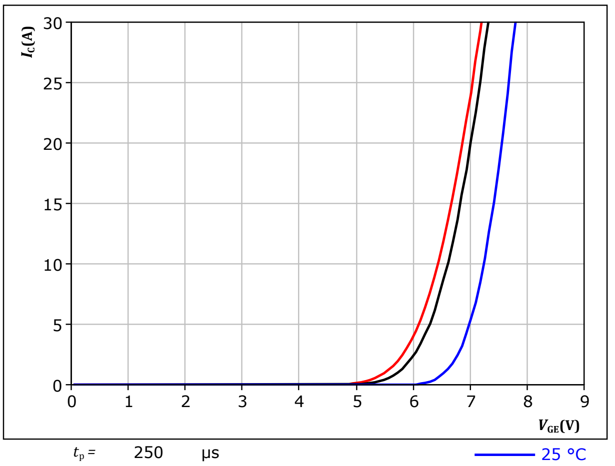



$t_p$ = 250 µs
$T_j$ = 150 °C
$V_{GE}$ from 7 V to 17 V in steps of 1 V

**figure 8.** **IGBT**

**Typical transfer characteristics**

$I_C$ = f( $V_{GE}$ )

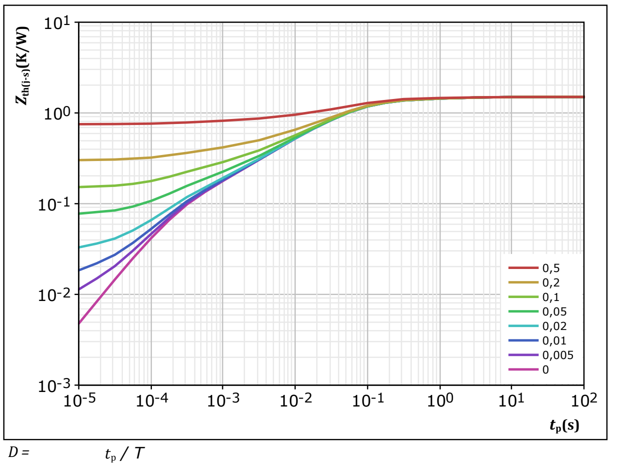



$t_p$ = 250 µs
$V_{CE}$ = 10 V
$T_j$: 25 °C, 125 °C, 150 °C

**figure 9.** **IGBT**

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)}$ = f( $t_p$ )




$D$ = $t_p$ / $T$
$R_{th(j-s)}$ = 1,501 K/W

IGBT thermal model values

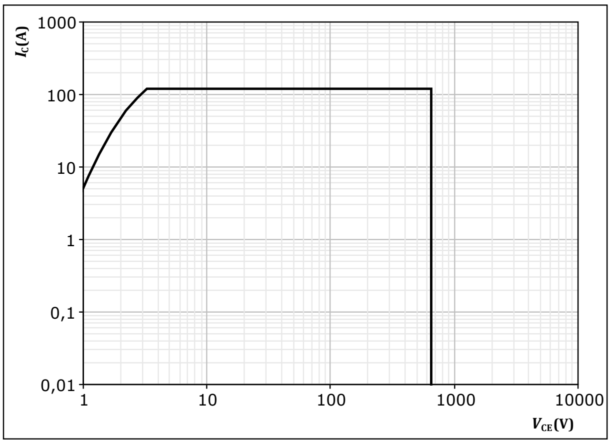
| $R$ (K/W) | $\tau$ (s) |
|---|---|
| 5,92E-02 | 3,33E+00 |
| 1,11E-01 | 5,14E-01 |
| 4,91E-01 | 8,64E-02 |
| 4,45E-01 | 3,10E-02 |
| 2,28E-01 | 6,69E-03 |
| 7,55E-02 | 1,48E-03 |
| 9,11E-02 | 2,40E-04 |

# High Buck Switch Characteristics

**figure 10.** **IGBT**

**Safe operating area**

$I_C = f(V_{CE})$



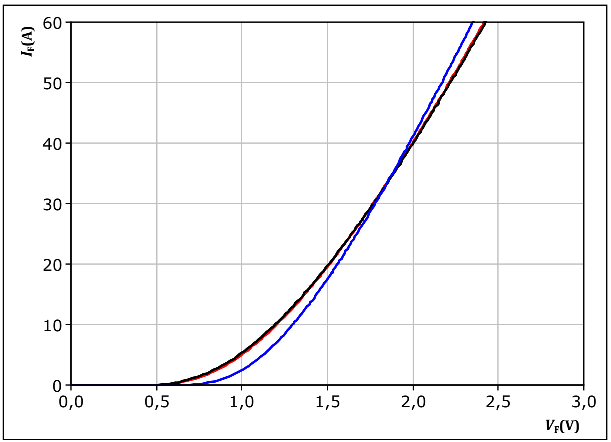

| | | |
|---|---|---|
| $D$ = | single pulse | |
| $T_s$ = | 80 | °C |
| $V_{GE}$ = | 15 | V |
| $T_j$ = | $T_{jmax}$ | |

# Buck Diode Characteristics

**figure 11.** **FWD**

**Typical forward characteristics**

$I_F = f(V_F)$



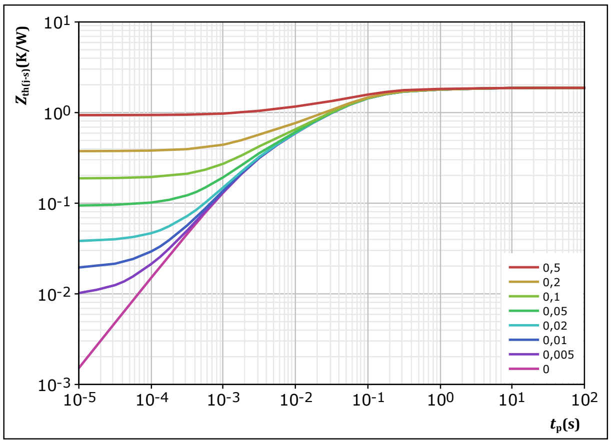

$t_p$ = 250 µs

$T_j$: 25 °C, 125 °C, 150 °C

**figure 12.** **FWD**

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)} = f(t_p)$




$D = t_p / T$

$R_{th(j-s)}$ = 1,875 K/W

FWD thermal model values

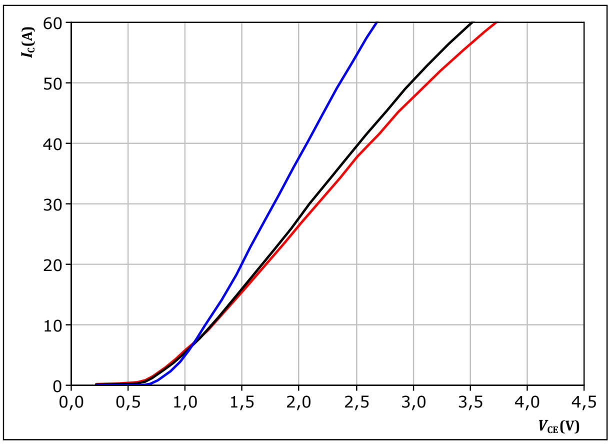
| $R$ (K/W) | $\tau$ (s) |
|---|---|
| 8,42E-02 | 3,60E+00 |
| 1,79E-01 | 3,95E-01 |
| 8,86E-01 | 7,08E-02 |
| 4,50E-01 | 1,69E-02 |
| 2,75E-01 | 2,45E-03 |

# Boost Switch Characteristics

**figure 13.** **IGBT**

**Typical output characteristics**

$I_C$ = f( $V_{CE}$ )



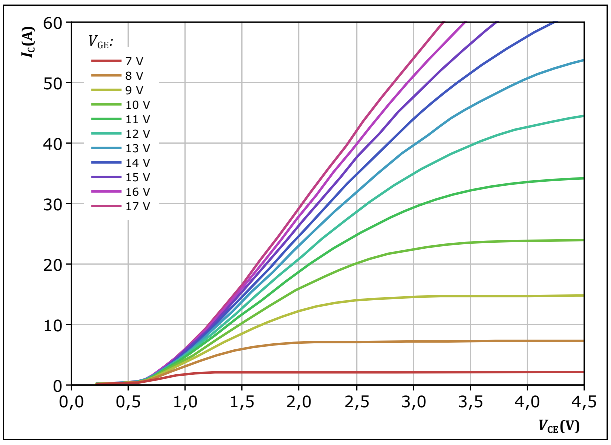

| | | |
|---|---|---|
| $t_p$ = | 250 | µs |
| $V_{GE}$ = | 15 | V |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 14.** **IGBT**

**Typical output characteristics**

$I_C$ = f( $V_{CE}$ )



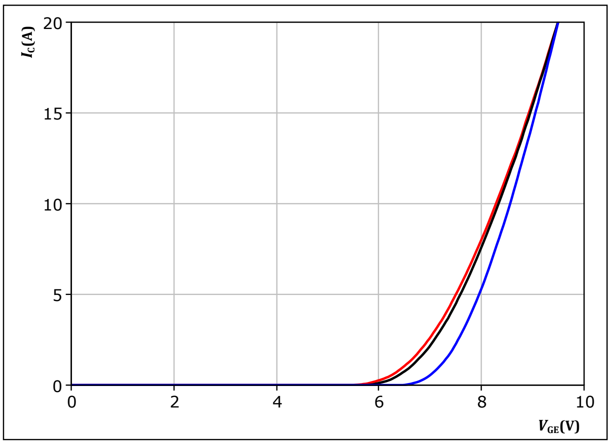

| | | |
|---|---|---|
| $t_p$ = | 250 | µs |
| $T_j$ = | 150 | °C |

$V_{GE}$ from 7 V to 17 V in steps of 1 V

**figure 15.** **IGBT**

**Typical transfer characteristics**

$I_C$ = f( $V_{GE}$ )



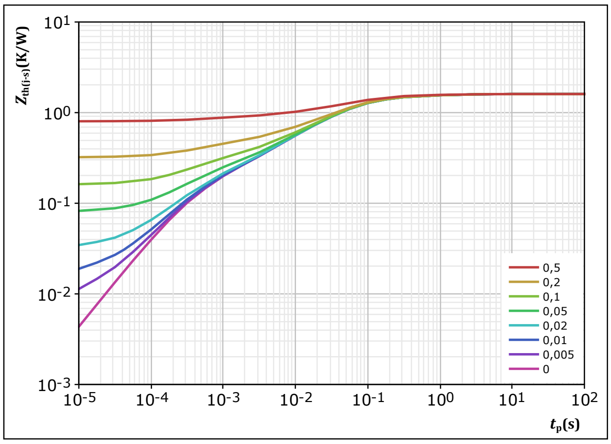

| | | |
|---|---|---|
| $t_p$ = | 250 | µs |
| $V_{CE}$ = | 10 | V |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 16.** **IGBT**

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)}$ = f( $t_p$ )




$D$ = $t_p$ / $T$

$R_{th(j-s)}$ = 1,604 K/W

IGBT thermal model values

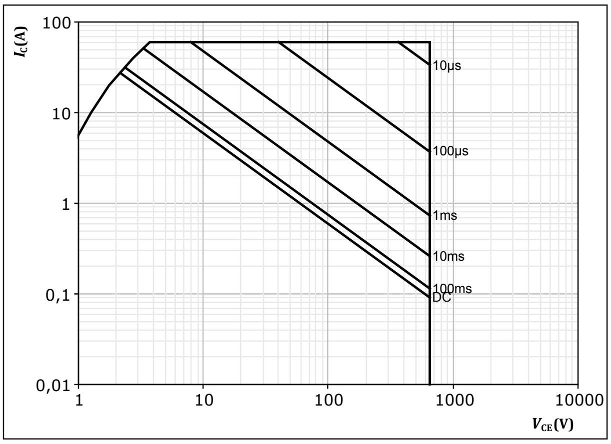
| R (K/W) | τ (s) |
|---|---|
| 8,72E-02 | 1,64E+00 |
| 2,19E-01 | 2,09E-01 |
| 7,41E-01 | 5,24E-02 |
| 3,11E-01 | 1,19E-02 |
| 1,15E-01 | 2,56E-03 |
| 1,31E-01 | 3,71E-04 |

# Boost Switch Characteristics

| **figure 17.** | **IGBT** |
|---|---|

**Safe operating area**

$I_C$ = f( $V_{CE}$ )



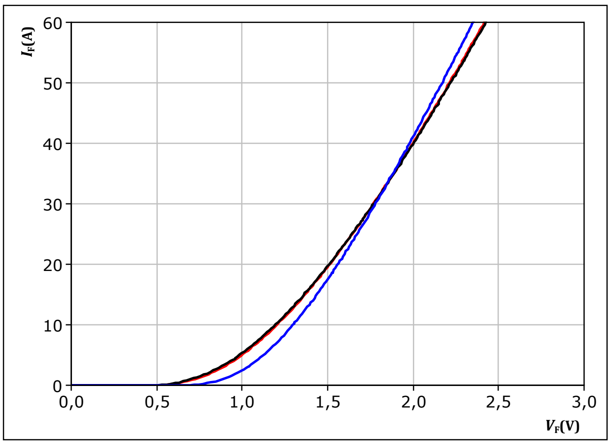

| | | |
|---|---|---|
| $D$ = | single pulse | |
| $T_s$ = | 80 | °C |
| $V_{GE}$ = | 15 | V |
| $T_j$ = | $T_{jmax}$ | |

# Low Boost Diode Characteristics

**figure 18.** **FWD**

**Typical forward characteristics**

$I_F = f(V_F)$



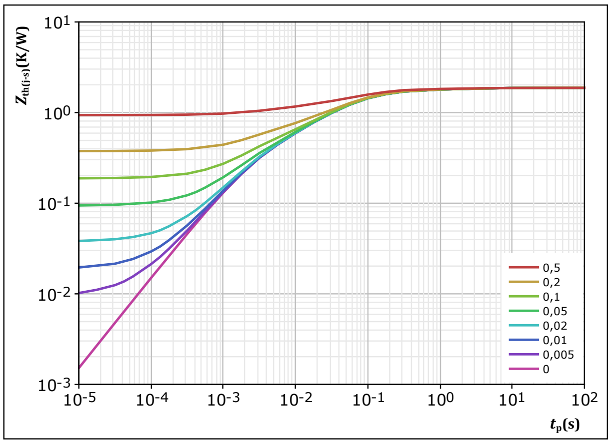

$t_p$ = 250 µs

$T_j$: 25 °C, 125 °C, 150 °C

**figure 19.** **FWD**

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)} = f(t_p)$




$D = t_p / T$

$R_{th(j-s)}$ = 1,875 K/W

FWD thermal model values

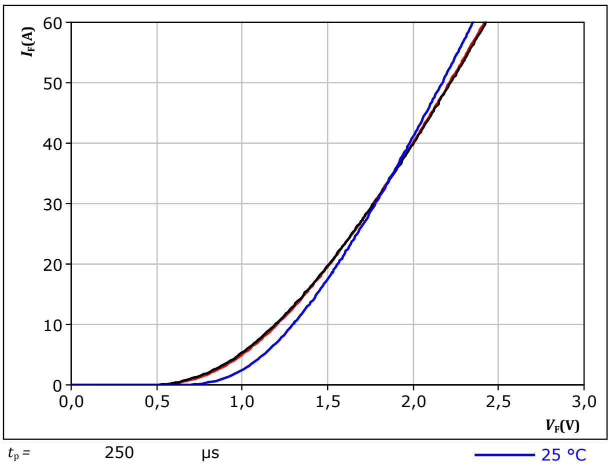
| $R$ (K/W) | $\tau$ (s) |
|---|---|
| 8,42E-02 | 3,60E+00 |
| 1,79E-01 | 3,95E-01 |
| 8,86E-01 | 7,08E-02 |
| 4,50E-01 | 1,69E-02 |
| 2,75E-01 | 2,45E-03 |

# High Boost Diode Characteristics

**figure 20.** **FWD**

**Typical forward characteristics**

$I_F = f(V_F)$



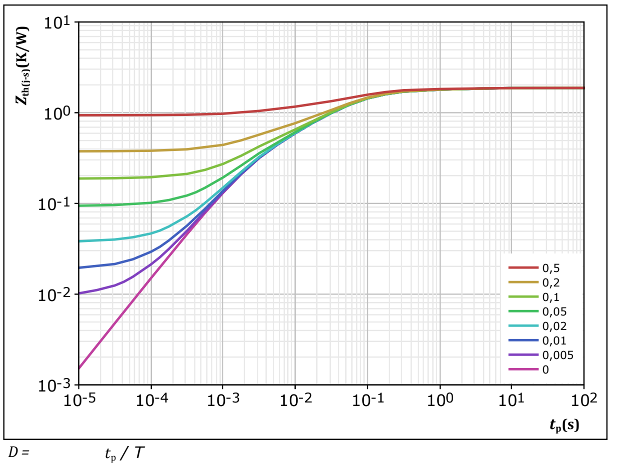

$t_p$ = 250 µs

$T_j$: 25 °C, 125 °C, 150 °C

**figure 21.** **FWD**

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)} = f(t_p)$




$D = t_p / T$

$R_{th(j-s)}$ = 1,875 K/W

FWD thermal model values

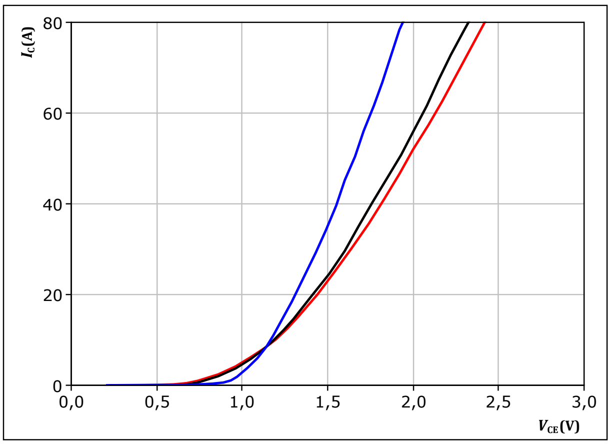
| $R$ (K/W) | $\tau$ (s) |
|---|---|
| 8,42E-02 | 3,60E+00 |
| 1,79E-01 | 3,95E-01 |
| 8,86E-01 | 7,08E-02 |
| 4,50E-01 | 1,69E-02 |
| 2,75E-01 | 2,45E-03 |

# Input Boost Switch Characteristics

**figure 22.** **IGBT**

**Typical output characteristics**

$I_C$ = f( $V_{CE}$ )



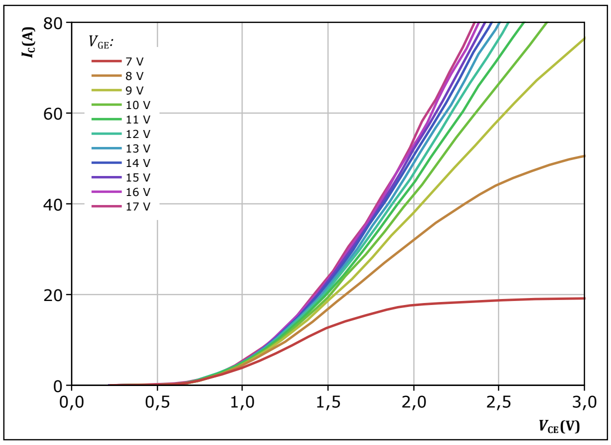

| | | |
|---|---|---|
| $t_p$ = | 250 | µs |
| $V_{GE}$ = | 15 | V |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 23.** **IGBT**

**Typical output characteristics**

$I_C$ = f( $V_{CE}$ )



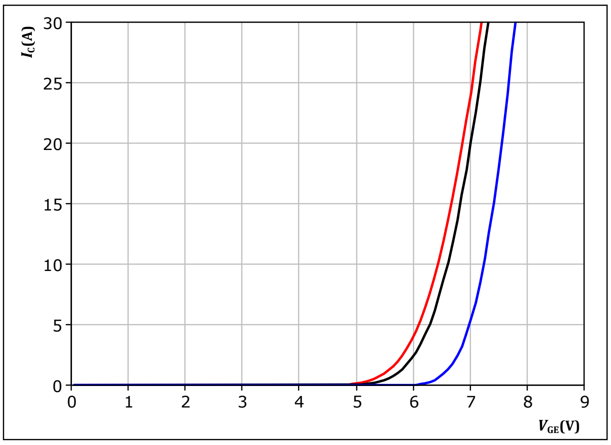

| | | |
|---|---|---|
| $t_p$ = | 250 | µs |
| $T_j$ = | 150 | °C |

$V_{GE}$ from 7 V to 17 V in steps of 1 V

**figure 24.** **IGBT**

**Typical transfer characteristics**

$I_C$ = f( $V_{GE}$ )



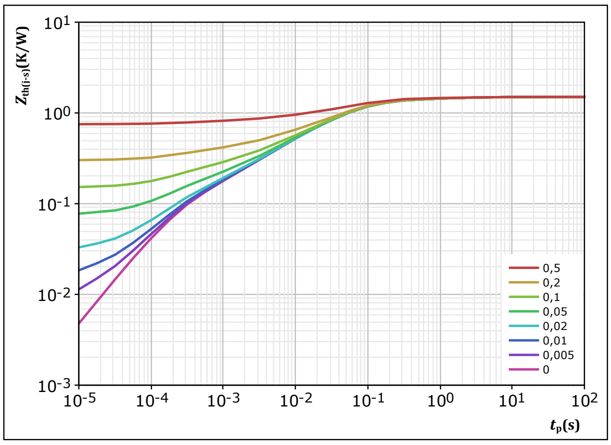

| | | |
|---|---|---|
| $t_p$ = | 250 | µs |
| $V_{CE}$ = | 10 | V |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 25.** **IGBT**

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)}$ = f( $t_p$ )




| | | |
|---|---|---|
| $D$ = | $t_p$ / $T$ | |
| $R_{th(j-s)}$ = | 1,501 | K/W |

IGBT thermal model values

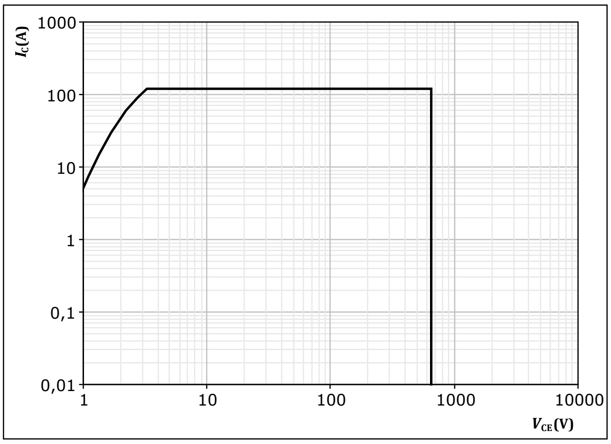
| $R$ (K/W) | $\tau$ (s) |
|---|---|
| 5,92E-02 | 3,33E+00 |
| 1,11E-01 | 5,14E-01 |
| 4,91E-01 | 8,64E-02 |
| 4,45E-01 | 3,10E-02 |
| 2,28E-01 | 6,69E-03 |
| 7,55E-02 | 1,48E-03 |
| 9,11E-02 | 2,40E-04 |

# Input Boost Switch Characteristics

| figure 26. | IGBT |
|---|---|

**Safe operating area**

$I_C$ = f( $V_{CE}$ )



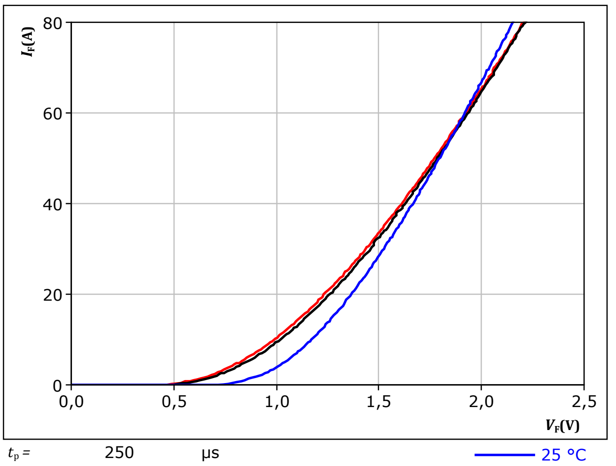

| | | |
|---|---|---|
| $D$ = | single pulse | |
| $T_s$ = | 80 | °C |
| $V_{GE}$ = | 15 | V |
| $T_j$ = | $T_{jmax}$ | |

# Input Boost Diode Characteristics

**figure 27.** **FWD**

**Typical forward characteristics**

$I_F$ = f( $V_F$)



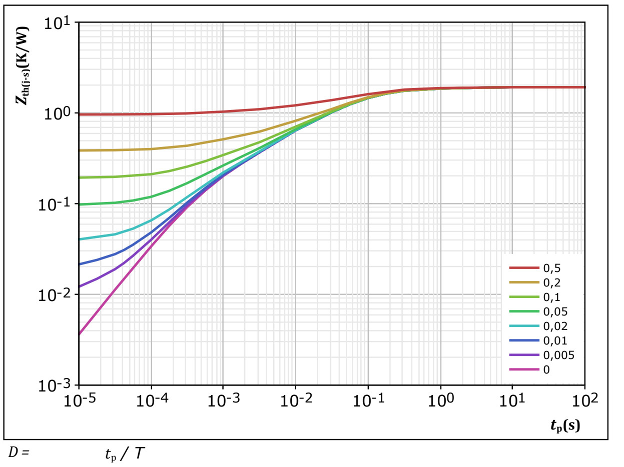

$t_p$ = 250 µs

$T_j$: 25 °C, 125 °C, 150 °C

**figure 28.** **FWD**

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)}$ = f( $t_p$)




$D$ = $t_p$ / $T$

$R_{th(j-s)}$ = 1,918 K/W

FWD thermal model values

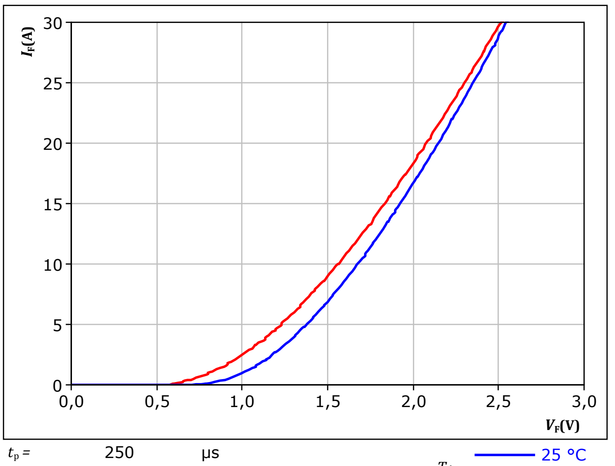
| $R$ (K/W) | $\tau$ (s) |
|---|---|
| 9,41E-02 | 2,25E+00 |
| 3,44E-01 | 2,12E-01 |
| 8,56E-01 | 5,84E-02 |
| 3,61E-01 | 9,83E-03 |
| 1,37E-01 | 2,89E-03 |
| 1,27E-01 | 4,79E-04 |

# Input Boost Sw. Protection Diode Characteristics

**figure 29.** **FWD**

**Typical forward characteristics**

$I_F$ = f( $V_F$)



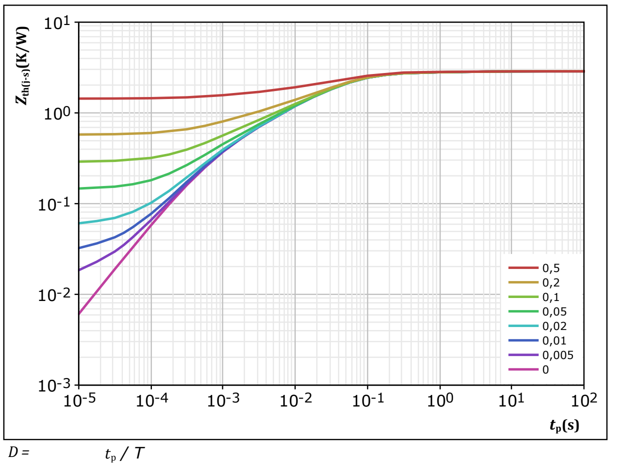

$t_p$ = 250 μs

$T_j$: 25 °C, 125 °C

**figure 30.** **FWD**

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)}$ = f( $t_p$)




$D$ = $t_p$ / $T$

$R_{th(j-s)}$ = 2,873 K/W

FWD thermal model values

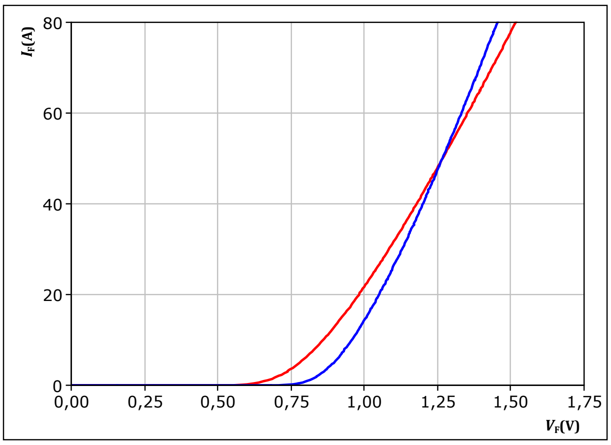
| R (K/W) | τ (s) |
|---|---|
| 6,53E-02 | 3,94E+00 |
| 1,48E-01 | 4,48E-01 |
| 1,31E+00 | 5,96E-02 |
| 7,32E-01 | 1,36E-02 |
| 4,04E-01 | 2,79E-03 |
| 2,11E-01 | 5,37E-04 |

# ByPass Diode Characteristics

**figure 31.** **Rectifier**

**Typical forward characteristics**

$I_F = f(V_F)$



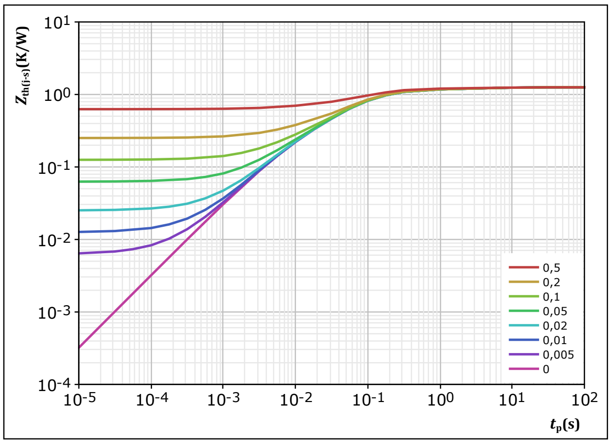

$t_p$ = 250 μs

$T_j$: 25 °C, 125 °C

**figure 32.** **Rectifier**

**Transient thermal impedance as a function of pulse width**

$Z_{th(j-s)} = f(t_p)$




$D = t_p / T$

$R_{th(j-s)}$ = 1,254 K/W

Rectifier thermal model values

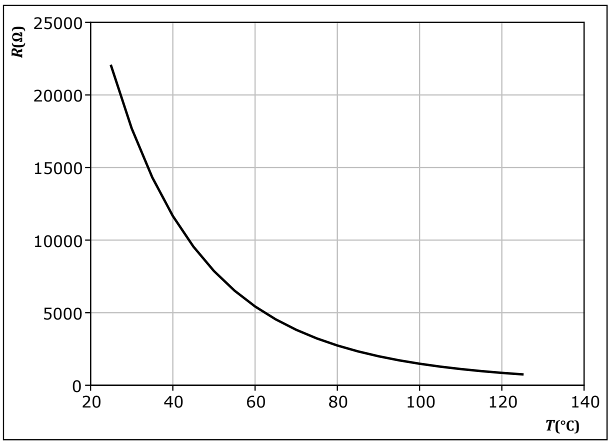
| R (K/W) | τ (s) |
|---|---|
| 8,00E-02 | 5,22E+00 |
| 1,56E-01 | 4,18E-01 |
| 6,95E-01 | 8,82E-02 |
| 2,23E-01 | 3,07E-02 |
| 9,97E-02 | 5,99E-03 |

# Thermistor Characteristics

**figure 33.** **Thermistor**

**Typical NTC characteristic as function of temperature**

$R_T$ = f( $T$)

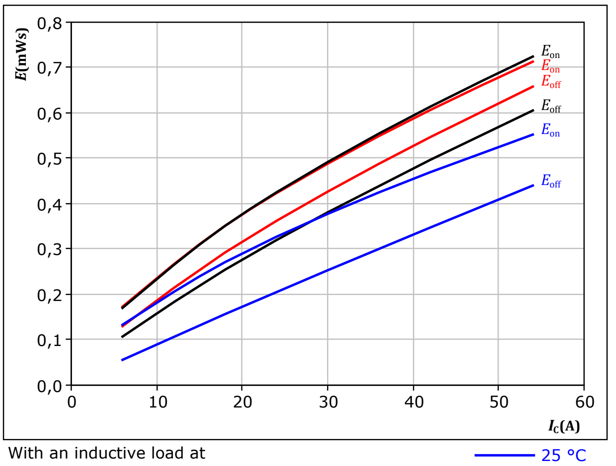


# Low Buck Switching Characteristics

**figure 34.** **IGBT**

**Typical switching energy losses as a function of collector current**

$E = f(I_C)$



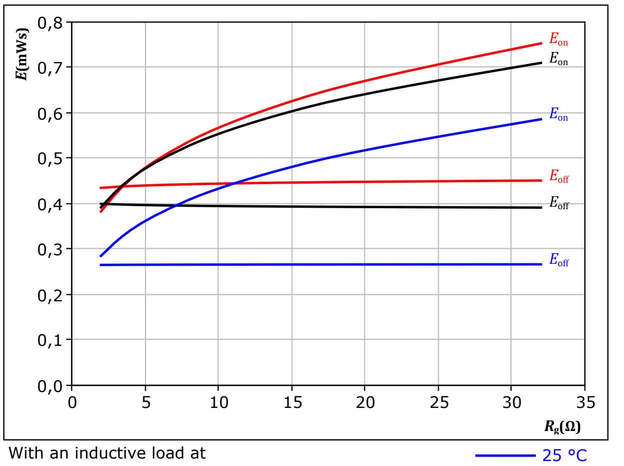

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |
| $R_{goff}$ = | 8 | Ω | | |

**figure 35.** **IGBT**

**Typical switching energy losses as a function of IGBT turn on gate resistor**

$E = f(R_g)$



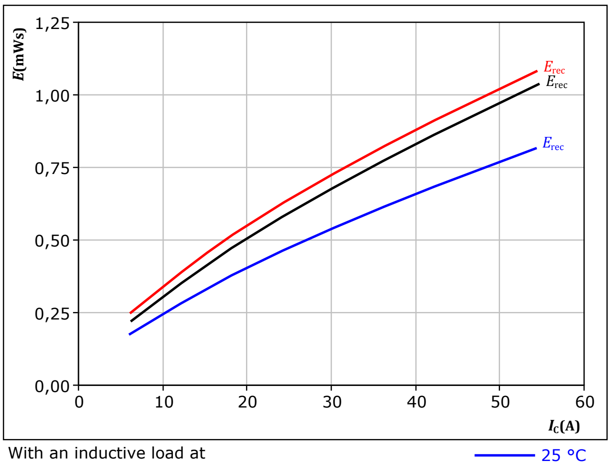

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

**figure 36.** **FWD**

**Typical reverse recovered energy loss as a function of collector current**

$E_{rec} = f(I_C)$



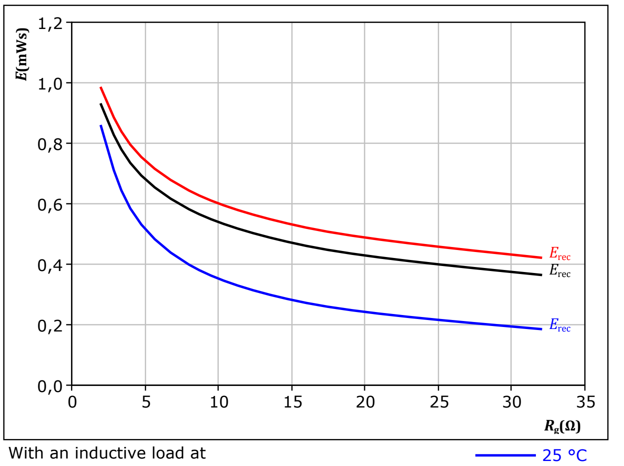

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |

**figure 37.** **FWD**

**Typical reverse recovered energy loss as a function of IGBT turn on gate resistor**

$E_{rec} = f(R_g)$




With an inductive load at

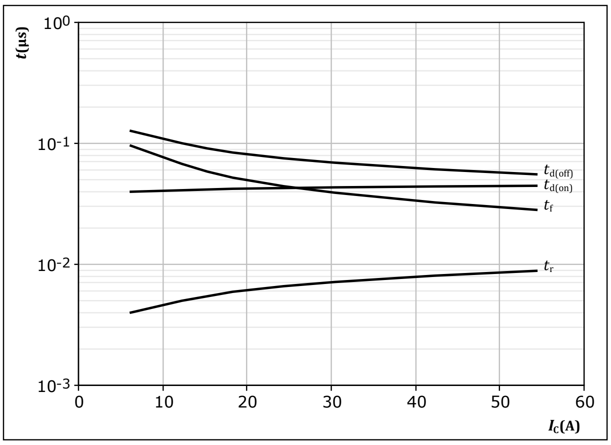
| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

# Low Buck Switching Characteristics

**figure 38.** **IGBT**

**Typical switching times as a function of collector current**

$t$ = f( $I_C$)



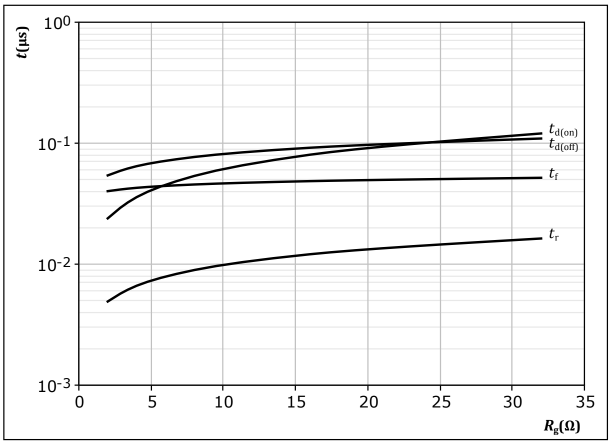

With an inductive load at

| | | |
|---|---|---|
| $T_j$ = | 150 | °C |
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $R_{gon}$ = | 8 | Ω |
| $R_{goff}$ = | 8 | Ω |

**figure 39.** **IGBT**

**Typical switching times as a function of IGBT turn on gate resistor**

$t$ = f( $R_g$)



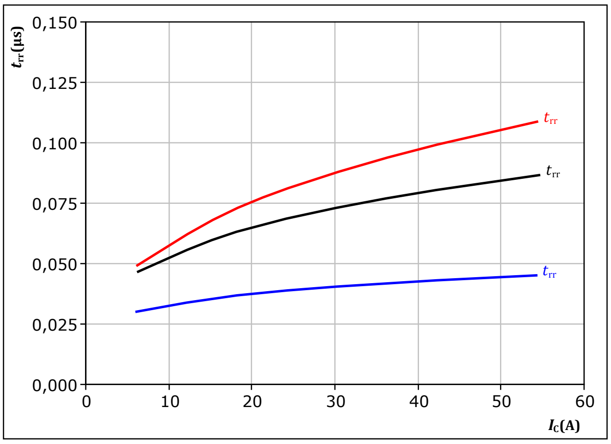

With an inductive load at

| | | |
|---|---|---|
| $T_j$ = | 150 | °C |
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $I_C$ = | 30 | A |

**figure 40.** **FWD**

**Typical reverse recovery time as a function of collector current**

$t_{rr}$ = f( $I_C$)




With an inductive load at

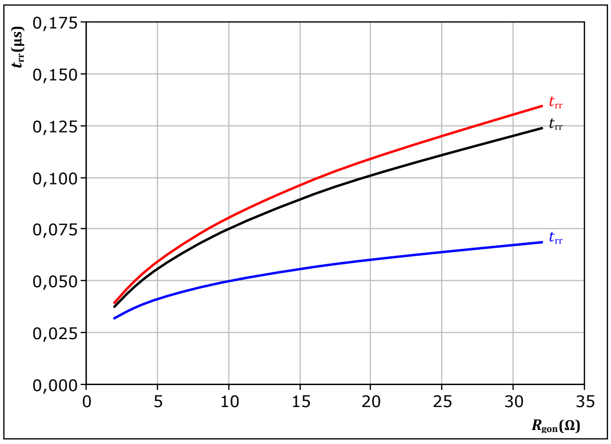
| | | |
|---|---|---|
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $R_{gon}$ = | 8 | Ω |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 41.** **FWD**

**Typical reverse recovery time as a function of IGBT turn on gate resistor**

$t_{rr}$ = f( $R_{gon}$)




With an inductive load at

| | | |
|---|---|---|
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $I_C$ = | 30 | A |

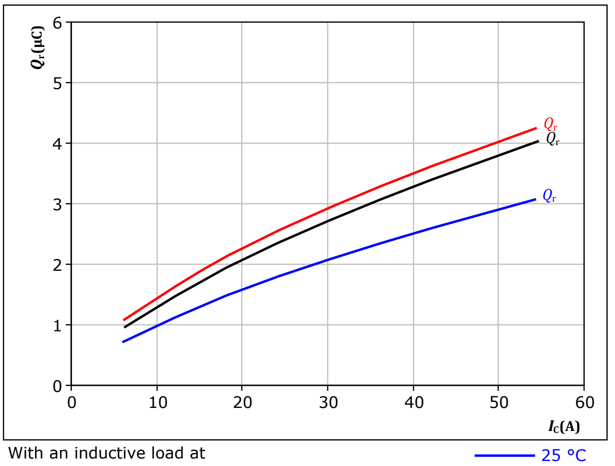
$T_j$: 25 °C, 125 °C, 150 °C

# Low Buck Switching Characteristics

**figure 42.** FWD

**Typical recovered charge as a function of collector current**

$Q_r = f(I_C)$



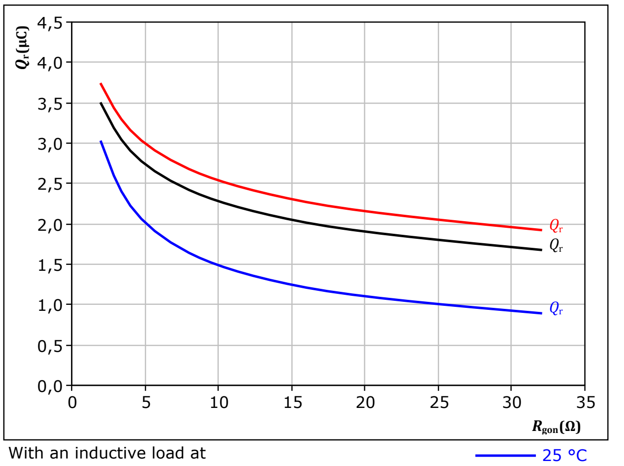

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |

**figure 43.** FWD

**Typical recovered charge as a function of IGBT turn on gate resistor**

$Q_r = f(R_{gon})$



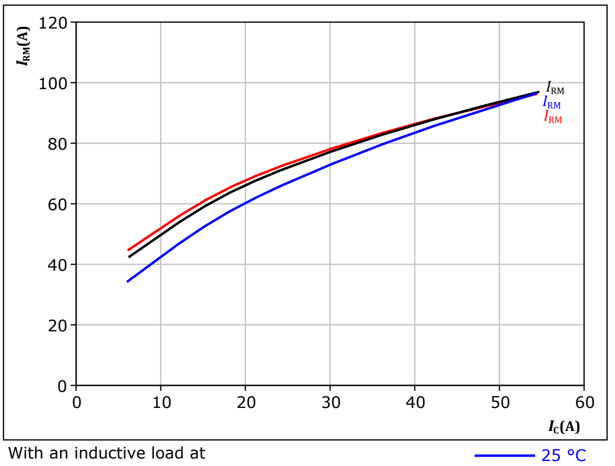

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

**figure 44.** FWD

**Typical peak reverse recovery current as a function of collector current**

$I_{RM} = f(I_C)$



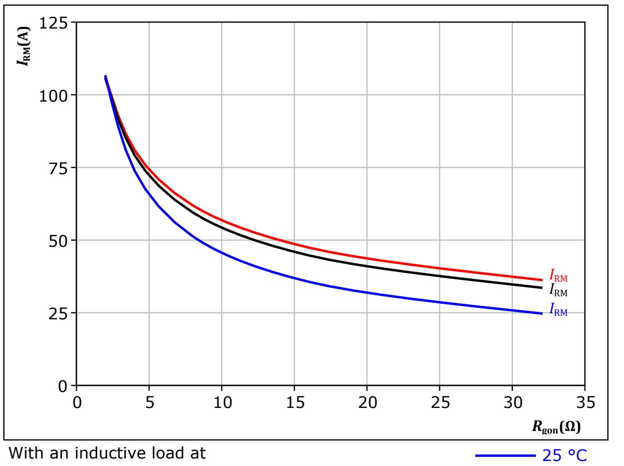

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |

**figure 45.** FWD

**Typical peak reverse recovery current as a function of IGBT turn on gate resistor**

$I_{RM} = f(R_{gon})$




With an inductive load at

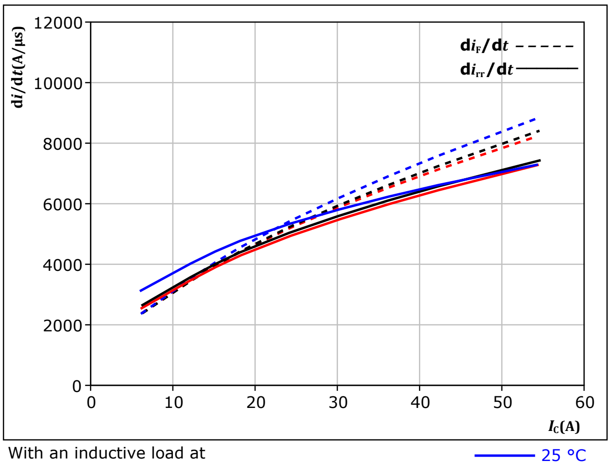
| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

# Low Buck Switching Characteristics

**figure 46.** **FWD**

**Typical rate of fall of forward and reverse recovery current as a function of collector current**

$di_F/dt$, $di_{rr}/dt$ = f( $I_C$)



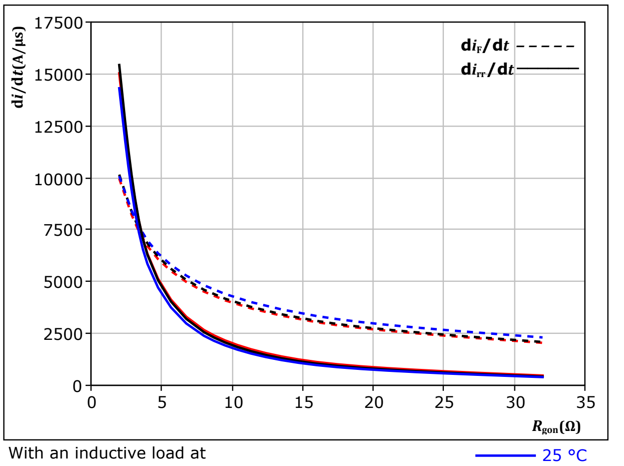

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |

**figure 47.** **FWD**

**Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor**

$di_F/dt$, $di_{rr}/dt$ = f( $R_{gon}$)



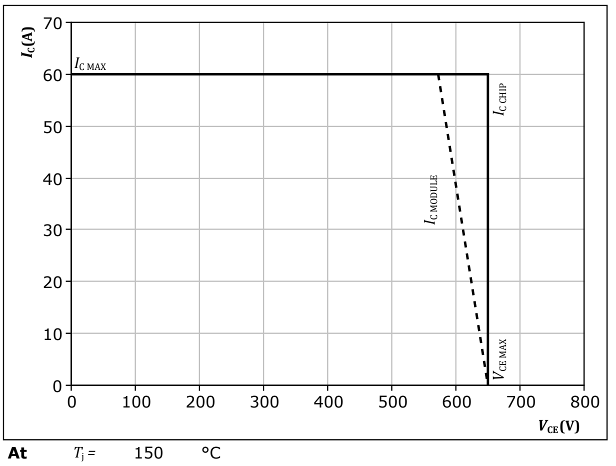

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

**figure 48.** **IGBT**

**Reverse bias safe operating area**

$I_C$ = f( $V_{CE}$)



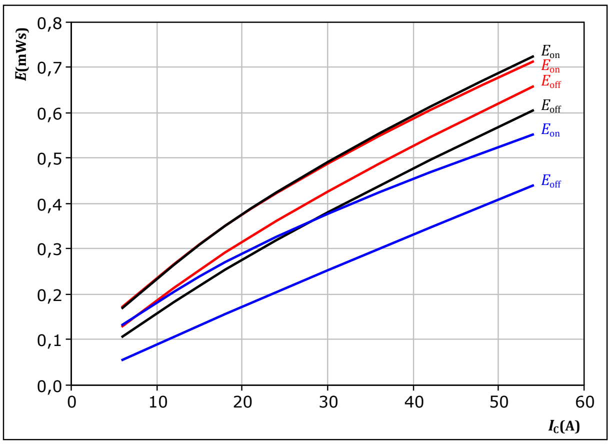

| | | | |
|---|---|---|---|
| **At** | $T_j$ = | 150 | °C |
| | $R_{gon}$ = | 8 | Ω |
| | $R_{goff}$ = | 8 | Ω |

# High Buck Switching Characteristics

**figure 49.** **IGBT**

**Typical switching energy losses as a function of collector current**

$E = f(I_C)$



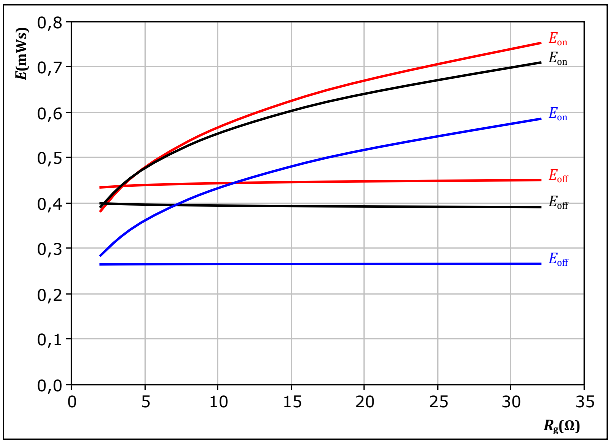

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |
| $R_{goff}$ = | 8 | Ω | | |

**figure 50.** **IGBT**

**Typical switching energy losses as a function of IGBT turn on gate resistor**

$E = f(R_g)$



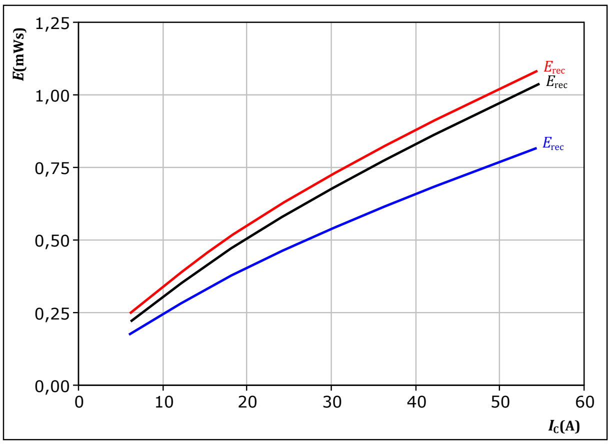

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

**figure 51.** **IGBT**

**Typical reverse recovered energy loss as a function of collector current**

$E_{rec} = f(I_C)$



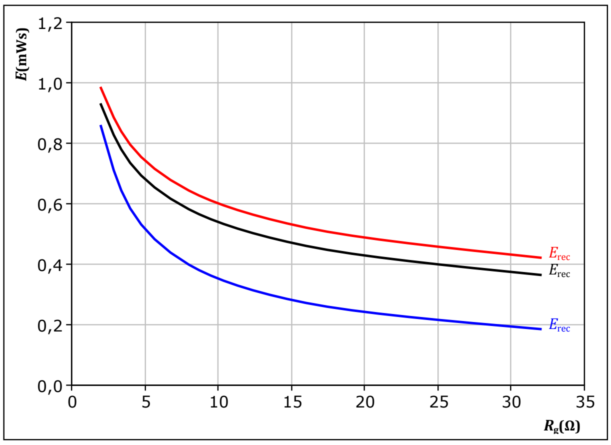

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |

**figure 52.** **IGBT**

**Typical reverse recovered energy loss as a function of IGBT turn on gate resistor**

$E_{rec} = f(R_g)$




With an inductive load at

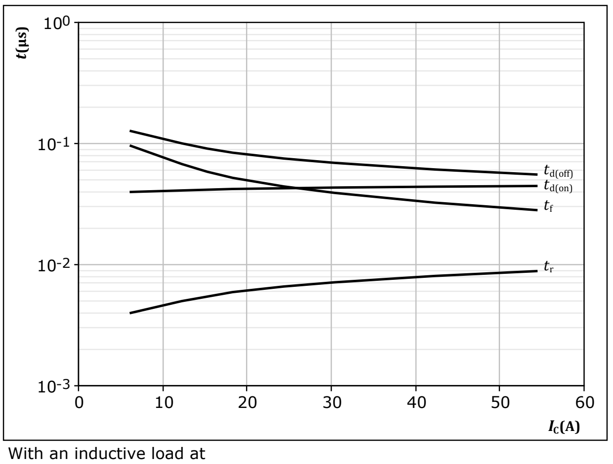
| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

# High Buck Switching Characteristics

**figure 53.** **IGBT**

**Typical switching times as a function of collector current**

$t$ = f( $I_C$)



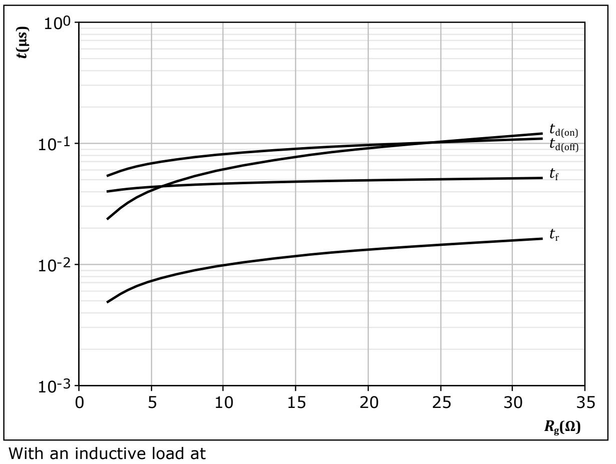

With an inductive load at

| | | |
|---|---|---|
| $T_j$ = | 150 | °C |
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $R_{gon}$ = | 8 | Ω |
| $R_{goff}$ = | 8 | Ω |

**figure 54.** **IGBT**

**Typical switching times as a function of IGBT turn on gate resistor**

$t$ = f( $R_g$)



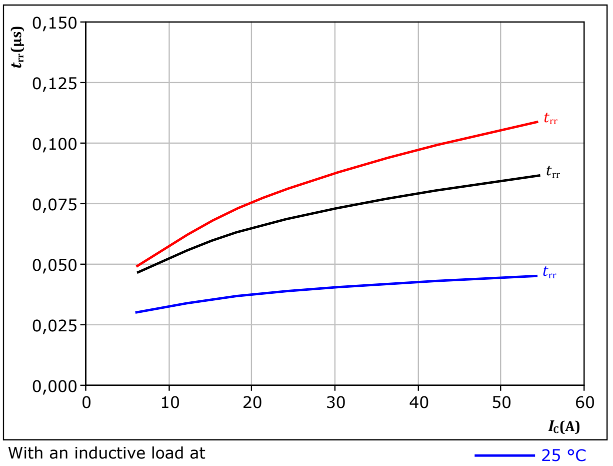

With an inductive load at

| | | |
|---|---|---|
| $T_j$ = | 150 | °C |
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $I_C$ = | 30 | A |

**figure 55.** **IGBT**

**Typical reverse recovery time as a function of collector current**

$t_{rr}$ = f( $I_C$)




With an inductive load at

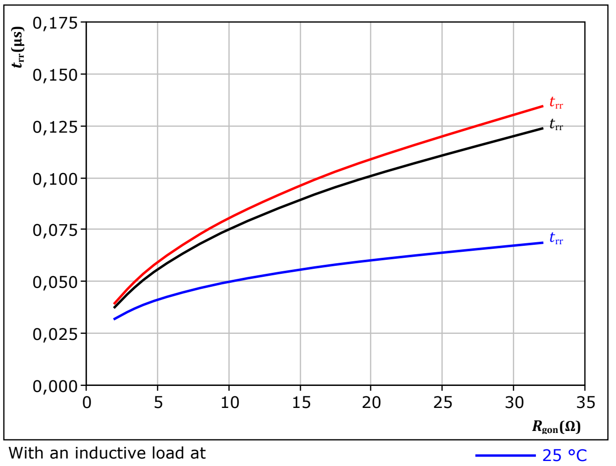
| | | |
|---|---|---|
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $R_{gon}$ = | 8 | Ω |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 56.** **IGBT**

**Typical reverse recovery time as a function of IGBT turn on gate resistor**

$t_{rr}$ = f( $R_{gon}$)




With an inductive load at

| | | |
|---|---|---|
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $I_C$ = | 30 | A |

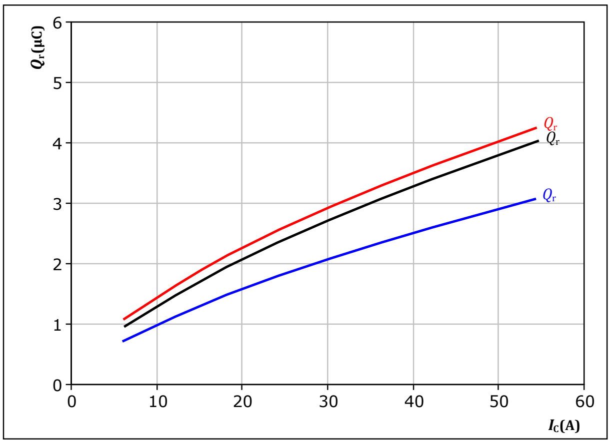
$T_j$: 25 °C, 125 °C, 150 °C

# High Buck Switching Characteristics

**figure 57.** **IGBT**

**Typical recovered charge as a function of collector current**

$Q_r$ = f( $I_C$)



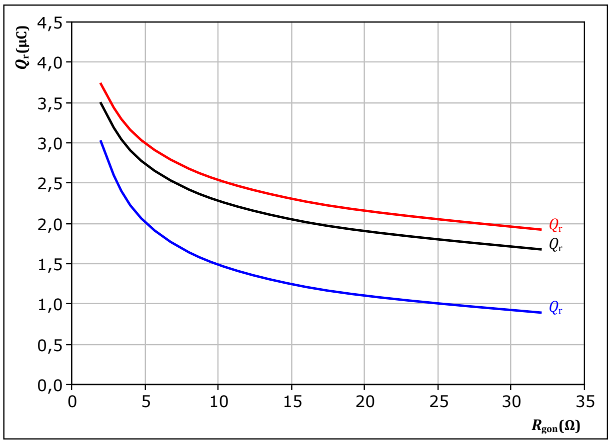

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |

**figure 58.** **IGBT**

**Typical recovered charge as a function of IGBT turn on gate resistor**

$Q_r$ = f( $R_{gon}$)



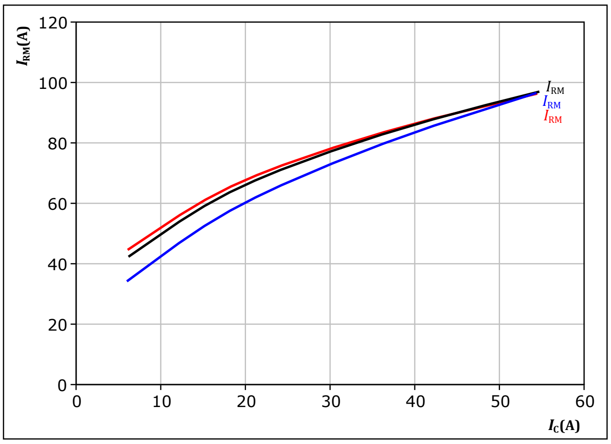

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

**figure 59.** **IGBT**

**Typical peak reverse recovery current as a function of collector current**

$I_{RM}$ = f( $I_C$)



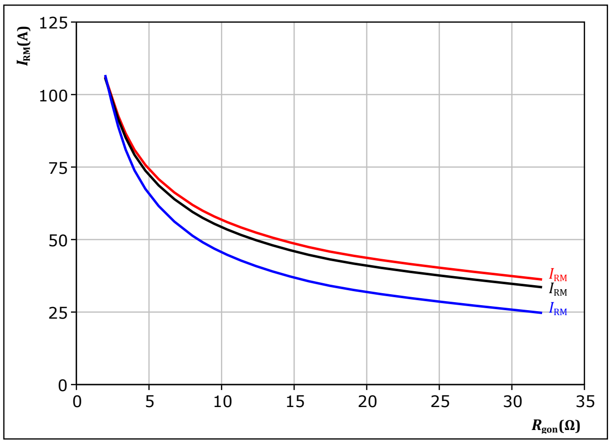

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |

**figure 60.** **IGBT**

**Typical peak reverse recovery current as a function of IGBT turn on gate resistor**

$I_{RM}$ = f( $R_{gon}$)




With an inductive load at

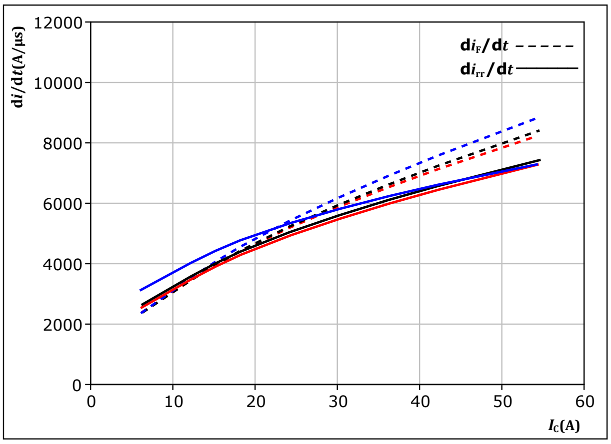
| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

# High Buck Switching Characteristics

**figure 61.** **IGBT**

**Typical rate of fall of forward and reverse recovery current as a function of collector current**

$di_F/dt$, $di_{rr}/dt$ = f( $I_C$)



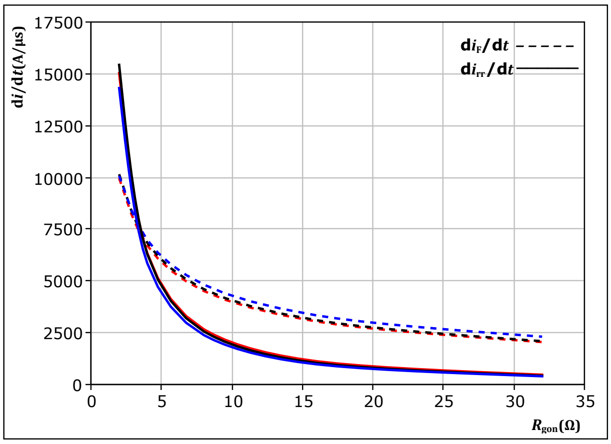

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |

**figure 62.** **IGBT**

**Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor**

$di_F/dt$, $di_{rr}/dt$ = f( $R_{gon}$)



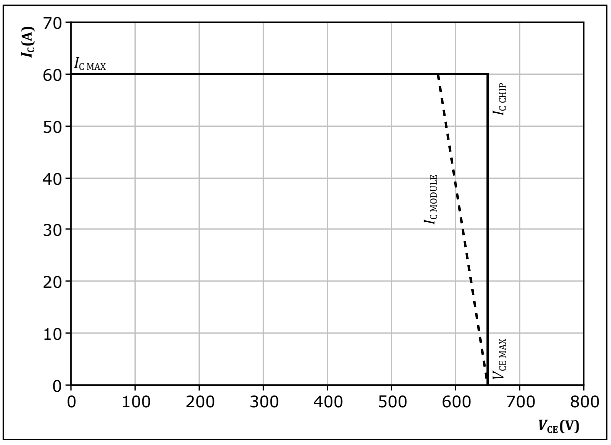

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

**figure 63.** **IGBT**

**Reverse bias safe operating area**

$I_C$ = f( $V_{CE}$)



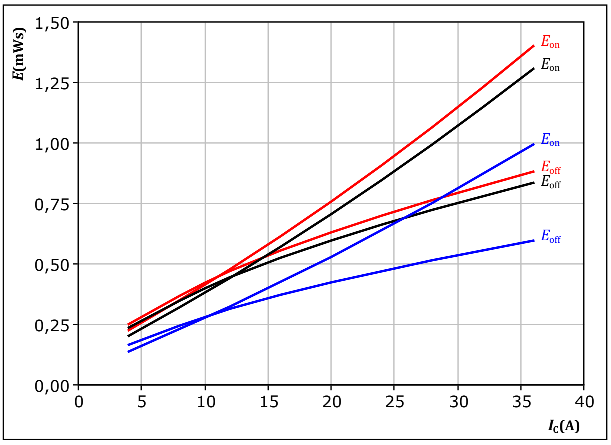

| | | | |
|---|---|---|---|
| **At** | $T_j$ = | 150 | °C |
| | $R_{gon}$ = | 8 | Ω |
| | $R_{goff}$ = | 8 | Ω |

# Boost Switching Characteristics

**figure 64.** **IGBT**

**Typical switching energy losses as a function of collector current**

$E = f(I_C)$




With an inductive load at

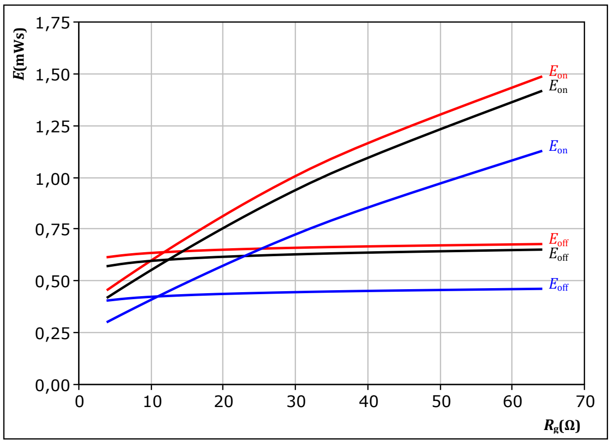
| | | | |
|---|---|---|---|
| $V_{CE}$ = | 350 | V | |
| $V_{GE}$ = | ±15 | V | |
| $R_{gon}$ = | 16 | Ω | |
| $R_{goff}$ = | 16 | Ω | |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 65.** **IGBT**

**Typical switching energy losses as a function of IGBT turn on gate resistor**

$E = f(R_g)$




With an inductive load at

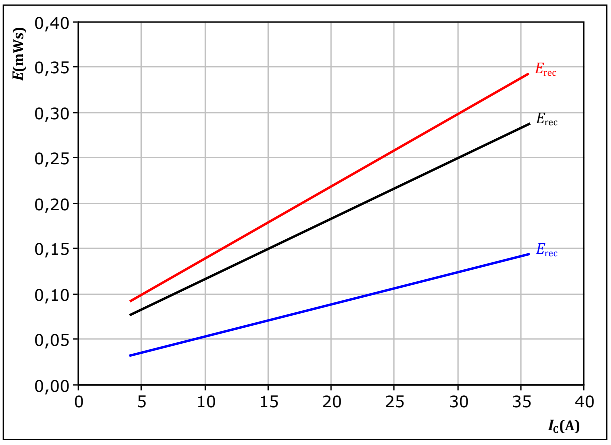
| | | | |
|---|---|---|---|
| $V_{CE}$ = | 350 | V | |
| $V_{GE}$ = | ±15 | V | |
| $I_C$ = | 20 | A | |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 66.** **FWD**

**Typical reverse recovered energy loss as a function of collector current**

$E_{rec} = f(I_C)$




With an inductive load at

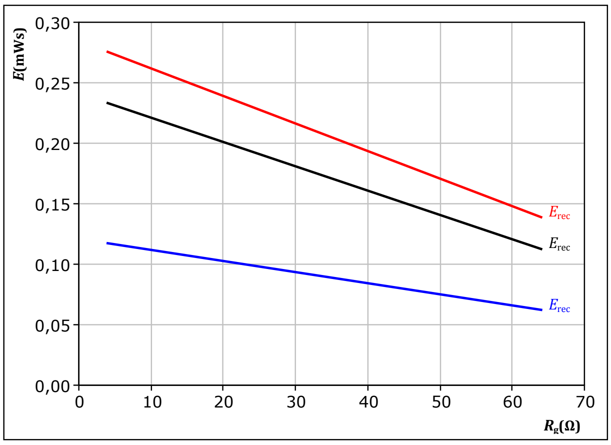
| | | | |
|---|---|---|---|
| $V_{CE}$ = | 350 | V | |
| $V_{GE}$ = | ±15 | V | |
| $R_{gon}$ = | 16 | Ω | |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 67.** **FWD**

**Typical reverse recovered energy loss as a function of IGBT turn on gate resistor**

$E_{rec} = f(R_g)$




With an inductive load at

| | | | |
|---|---|---|---|
| $V_{CE}$ = | 350 | V | |
| $V_{GE}$ = | ±15 | V | |
| $I_C$ = | 20 | A | |

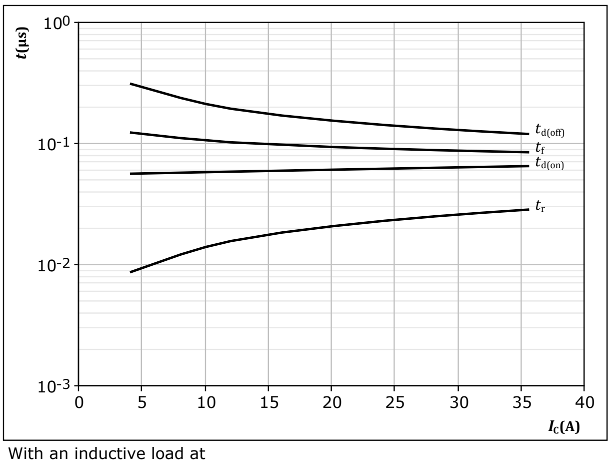
$T_j$: 25 °C, 125 °C, 150 °C

# Boost Switching Characteristics

**figure 68.** **IGBT**

**Typical switching times as a function of collector current**

$t$ = f( $I_C$)



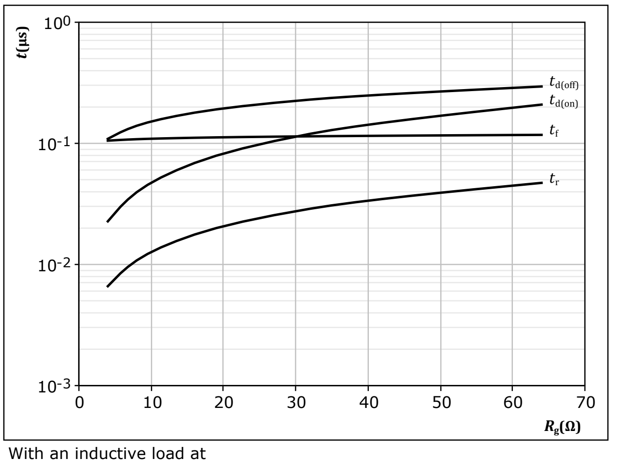

With an inductive load at

| | | |
|---|---|---|
| $T_j$ = | 150 | °C |
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $R_{gon}$ = | 16 | Ω |
| $R_{goff}$ = | 16 | Ω |

**figure 69.** **IGBT**

**Typical switching times as a function of IGBT turn on gate resistor**

$t$ = f( $R_g$)



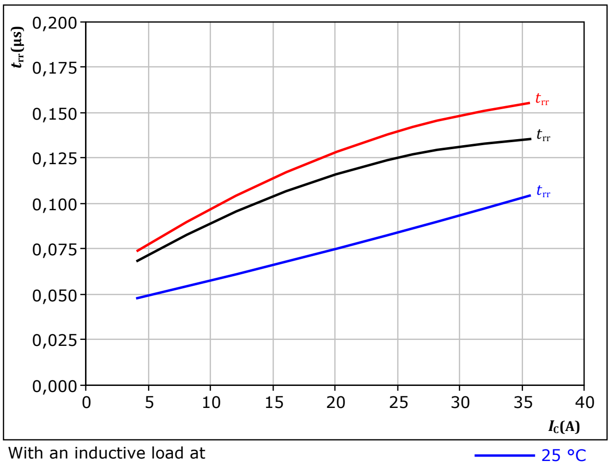

With an inductive load at

| | | |
|---|---|---|
| $T_j$ = | 150 | °C |
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $I_C$ = | 20 | A |

**figure 70.** **FWD**

**Typical reverse recovery time as a function of collector current**

$t_{rr}$ = f( $I_C$)




With an inductive load at

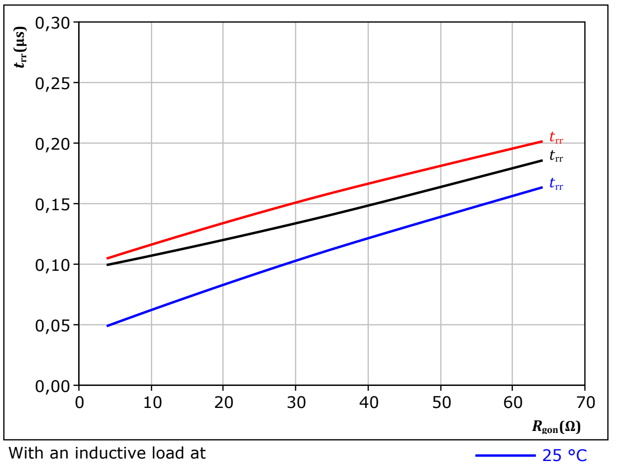
| | | |
|---|---|---|
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $R_{gon}$ = | 16 | Ω |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 71.** **FWD**

**Typical reverse recovery time as a function of IGBT turn on gate resistor**

$t_{rr}$ = f( $R_{gon}$)




With an inductive load at

| | | |
|---|---|---|
| $V_{CE}$ = | 350 | V |
| $V_{GE}$ = | ±15 | V |
| $I_C$ = | 20 | A |

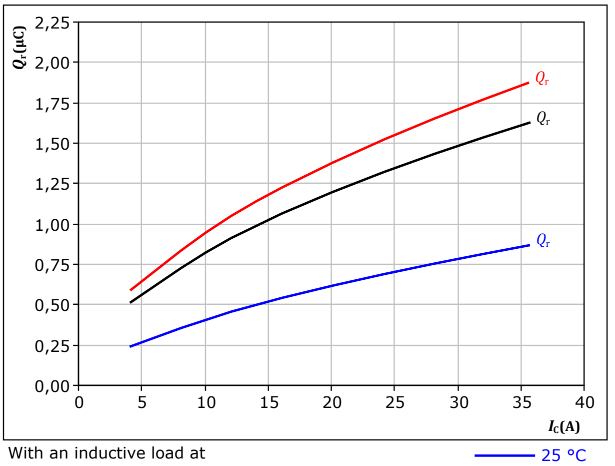
$T_j$: 25 °C, 125 °C, 150 °C

# Boost Switching Characteristics

**figure 72.** **FWD**

**Typical recovered charge as a function of collector current**

$Q_r$ = f( $I_C$)



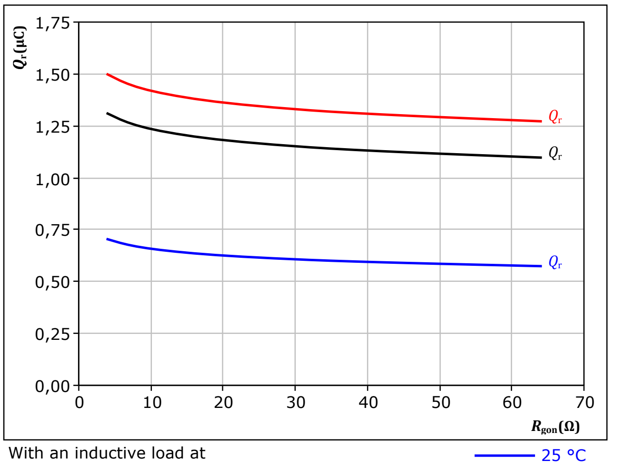

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 16 | Ω | | 150 °C |

**figure 73.** **FWD**

**Typical recovered charge as a function of IGBT turn on gate resistor**

$Q_r$ = f( $R_{gon}$)



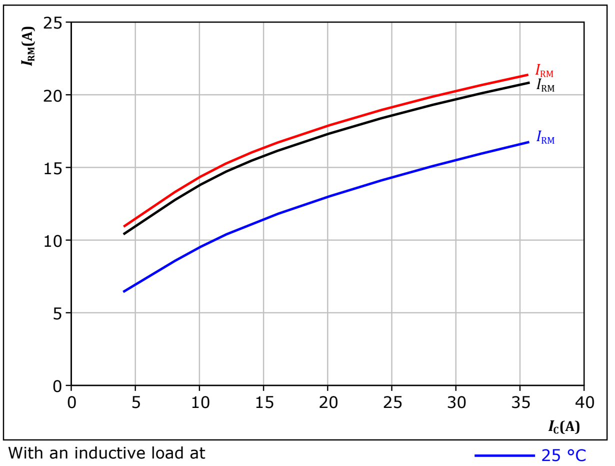

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 20 | A | | 150 °C |

**figure 74.** **FWD**

**Typical peak reverse recovery current as a function of collector current**

$I_{RM}$ = f( $I_C$)



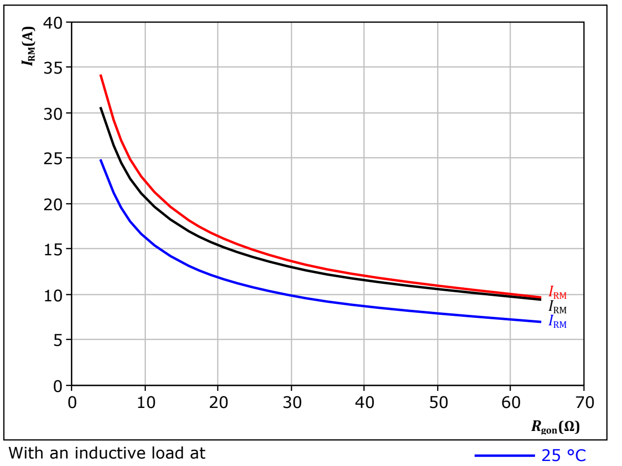

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 16 | Ω | | 150 °C |

**figure 75.** **FWD**

**Typical peak reverse recovery current as a function of IGBT turn on gate resistor**

$I_{RM}$ = f( $R_{gon}$)




With an inductive load at

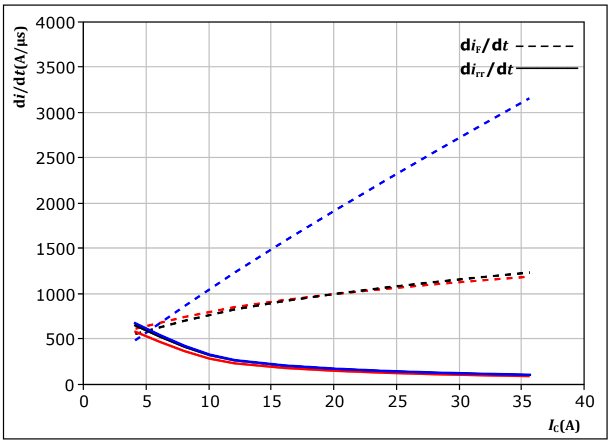
| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 20 | A | | 150 °C |

# Boost Switching Characteristics

**figure 76.** **FWD**

**Typical rate of fall of forward and reverse recovery current as a function of collector current**

$di_F/dt$, $di_{rr}/dt$ = f( $I_C$)



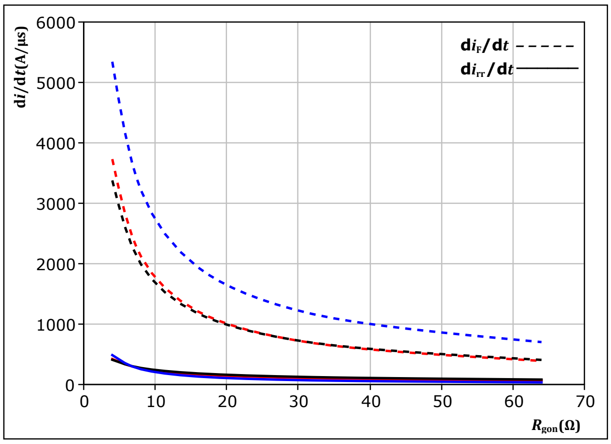

With an inductive load at

| | | | $T_j$: | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $R_{gon}$ = | 16 | Ω | | 150 °C |

**figure 77.** **FWD**

**Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor**

$di_F/dt$, $di_{rr}/dt$ = f( $R_{gon}$)



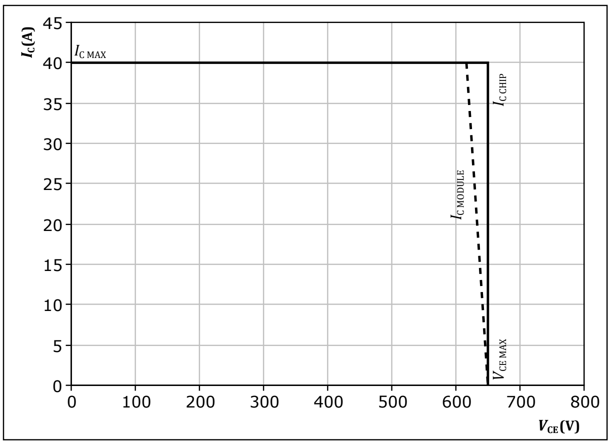

With an inductive load at

| | | | $T_j$: | |
|---|---|---|---|---|
| $V_{CE}$ = | 350 | V | | 25 °C |
| $V_{GE}$ = | ±15 | V | | 125 °C |
| $I_C$ = | 20 | A | | 150 °C |

**figure 78.** **IGBT**

**Reverse bias safe operating area**

$I_C$ = f( $V_{CE}$)



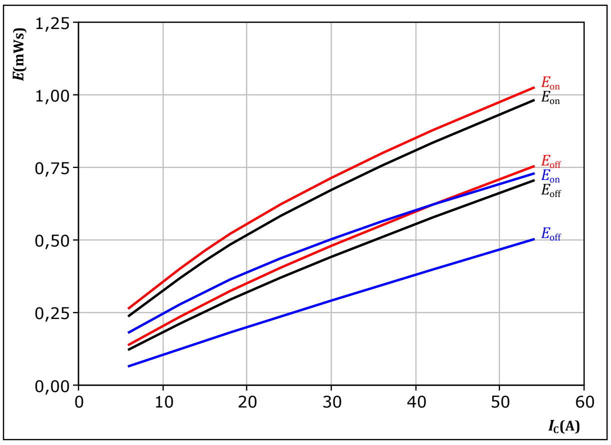

| **At** | | | |
|---|---|---|---|
| | $T_j$ = | 150 | °C |
| | $R_{gon}$ = | 16 | Ω |
| | $R_{goff}$ = | 16 | Ω |

# Input Boost Switching Characteristics

**figure 79.** **IGBT**

**Typical switching energy losses as a function of collector current**

$E = f(I_C)$



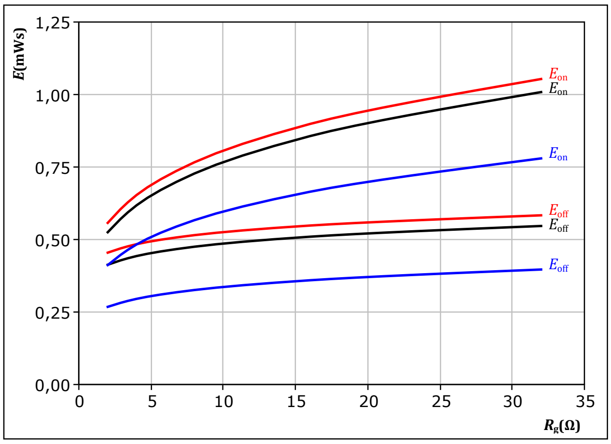

With an inductive load at

| | | | |
|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: 25 °C |
| $V_{GE}$ = | 0/15 | V | 125 °C |
| $R_{gon}$ = | 8 | Ω | 150 °C |
| $R_{goff}$ = | 8 | Ω | |

**figure 80.** **IGBT**

**Typical switching energy losses as a function of IGBT turn on gate resistor**

$E = f(R_g)$



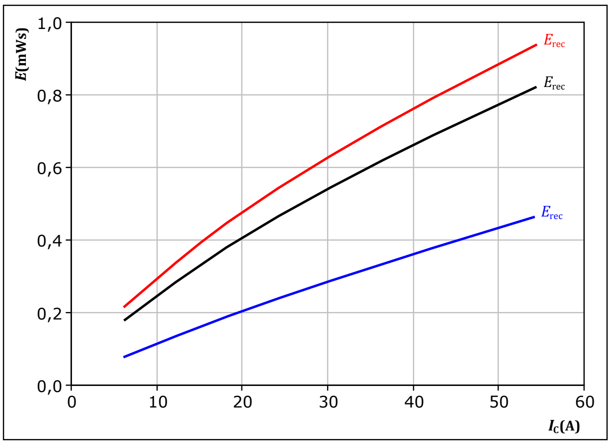

With an inductive load at

| | | | |
|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: 25 °C |
| $V_{GE}$ = | 0/15 | V | 125 °C |
| $I_C$ = | 30 | A | 150 °C |

**figure 81.** **FWD**

**Typical reverse recovered energy loss as a function of collector current**

$E_{rec} = f(I_C)$



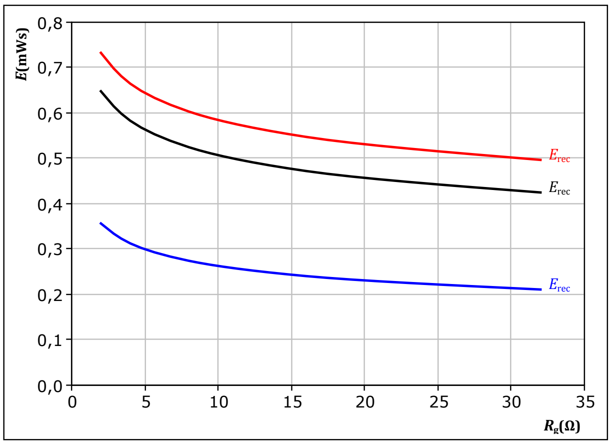

With an inductive load at

| | | | |
|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: 25 °C |
| $V_{GE}$ = | 0/15 | V | 125 °C |
| $R_{gon}$ = | 8 | Ω | 150 °C |

**figure 82.** **FWD**

**Typical reverse recovered energy loss as a function of IGBT turn on gate resistor**

$E_{rec} = f(R_g)$




With an inductive load at

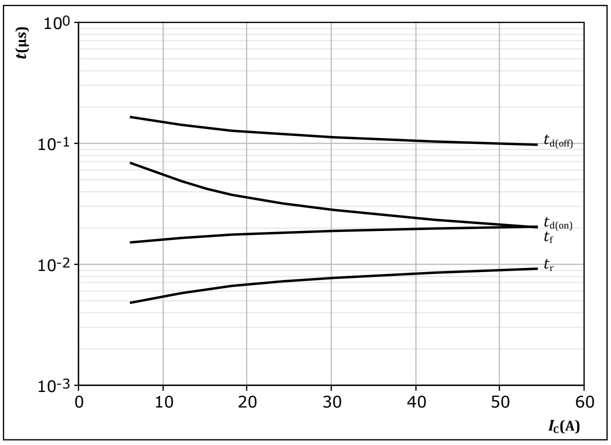
| | | | |
|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: 25 °C |
| $V_{GE}$ = | 0/15 | V | 125 °C |
| $I_C$ = | 30 | A | 150 °C |

# Input Boost Switching Characteristics

**figure 83.** **IGBT**

**Typical switching times as a function of collector current**

$t$ = f( $I_C$ )



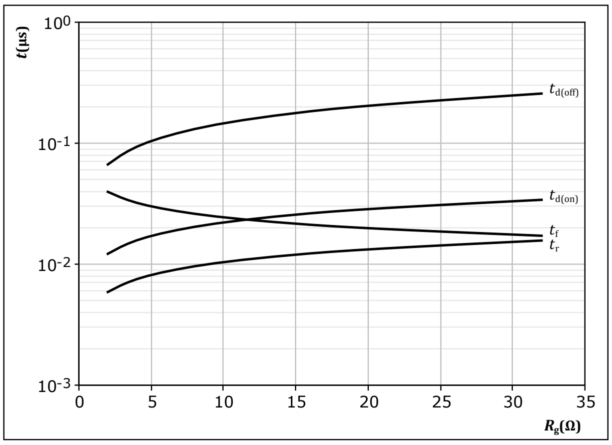

With an inductive load at

| | | |
|---|---|---|
| $T_j$ = | 150 | °C |
| $V_{CE}$ = | 400 | V |
| $V_{GE}$ = | 0/15 | V |
| $R_{gon}$ = | 8 | Ω |
| $R_{goff}$ = | 8 | Ω |

**figure 84.** **IGBT**

**Typical switching times as a function of IGBT turn on gate resistor**

$t$ = f( $R_g$ )



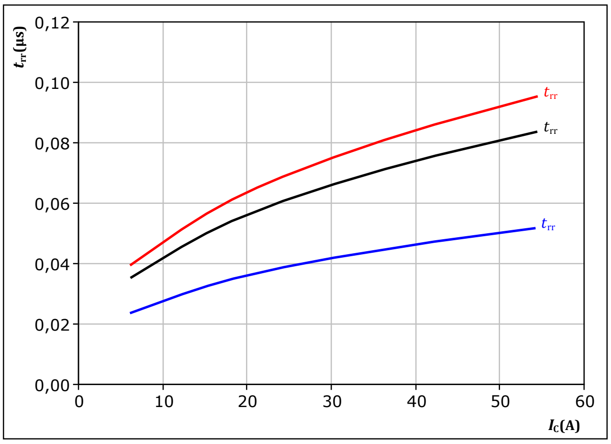

With an inductive load at

| | | |
|---|---|---|
| $T_j$ = | 150 | °C |
| $V_{CE}$ = | 400 | V |
| $V_{GE}$ = | 0/15 | V |
| $I_C$ = | 30 | A |

**figure 85.** **FWD**

**Typical reverse recovery time as a function of collector current**

$t_{rr}$ = f( $I_C$ )




With an inductive load at

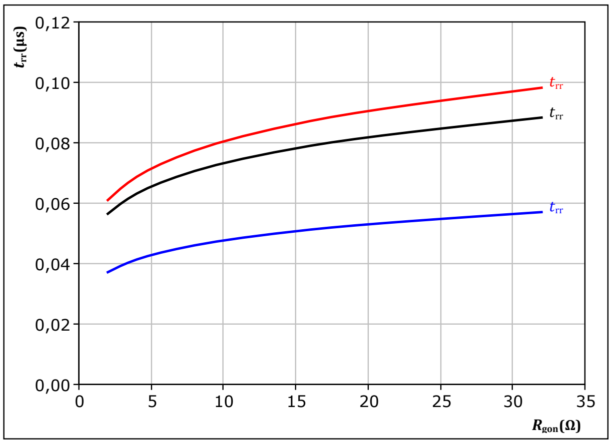
| | | |
|---|---|---|
| $V_{CE}$ = | 400 | V |
| $V_{GE}$ = | 0/15 | V |
| $R_{gon}$ = | 8 | Ω |

$T_j$: 25 °C, 125 °C, 150 °C

**figure 86.** **FWD**

**Typical reverse recovery time as a function of IGBT turn on gate resistor**

$t_{rr}$ = f( $R_{gon}$ )




With an inductive load at

| | | |
|---|---|---|
| $V_{CE}$ = | 400 | V |
| $V_{GE}$ = | 0/15 | V |
| $I_C$ = | 30 | A |

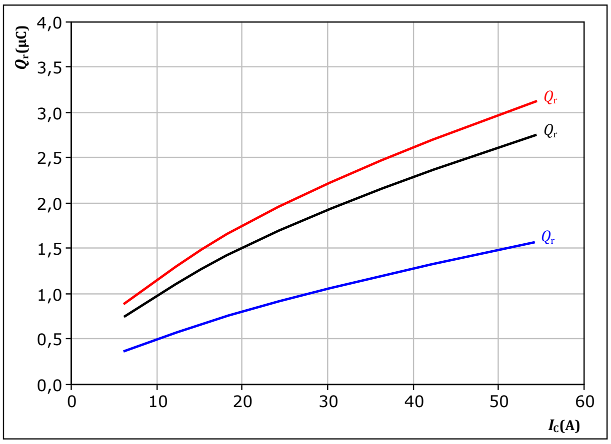
$T_j$: 25 °C, 125 °C, 150 °C

# Input Boost Switching Characteristics

**figure 87.** FWD

**Typical recovered charge as a function of collector current**

$Q_r = f(I_C)$



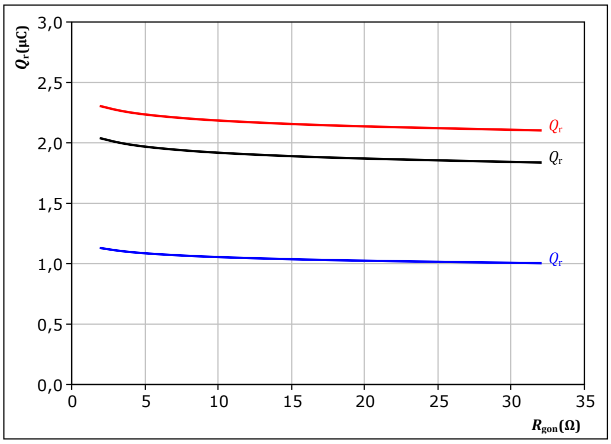

With an inductive load at

| | | | |
|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: 25 °C / 125 °C / 150 °C |
| $V_{GE}$ = | 0/15 | V | |
| $R_{gon}$ = | 8 | Ω | |

**figure 88.** FWD

**Typical recovered charge as a function of IGBT turn on gate resistor**

$Q_r = f(R_{gon})$



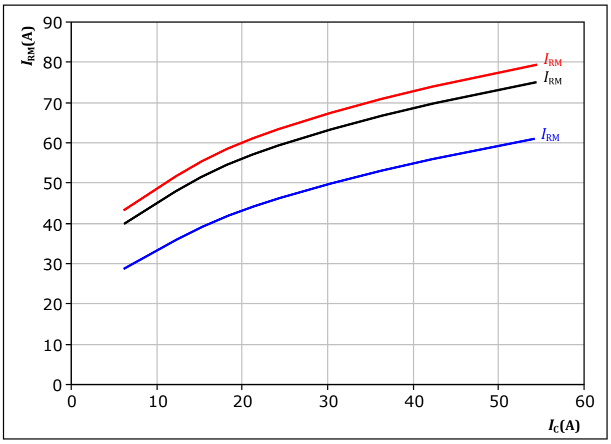

With an inductive load at

| | | | |
|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: 25 °C / 125 °C / 150 °C |
| $V_{GE}$ = | 0/15 | V | |
| $I_C$ = | 30 | A | |

**figure 89.** FWD

**Typical peak reverse recovery current as a function of collector current**

$I_{RM} = f(I_C)$



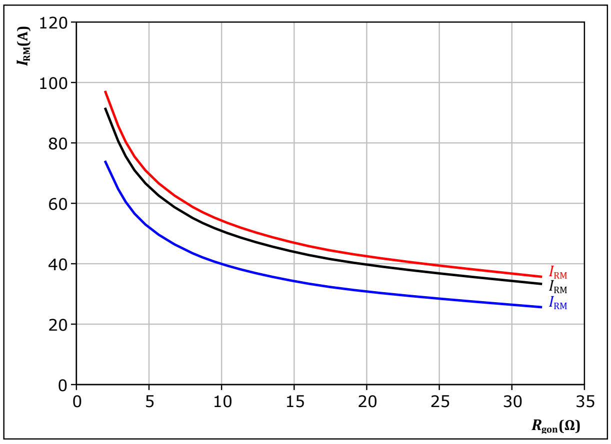

With an inductive load at

| | | | |
|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: 25 °C / 125 °C / 150 °C |
| $V_{GE}$ = | 0/15 | V | |
| $R_{gon}$ = | 8 | Ω | |

**figure 90.** FWD

**Typical peak reverse recovery current as a function of IGBT turn on gate resistor**

$I_{RM} = f(R_{gon})$




With an inductive load at

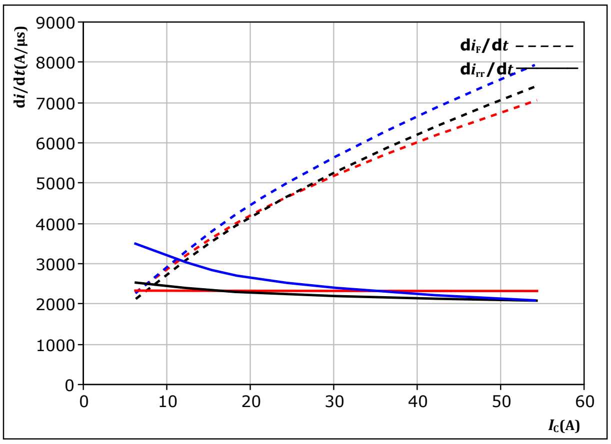
| | | | |
|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: 25 °C / 125 °C / 150 °C |
| $V_{GE}$ = | 0/15 | V | |
| $I_C$ = | 30 | A | |

# Input Boost Switching Characteristics

**figure 91.** **FWD**

**Typical rate of fall of forward and reverse recovery current as a function of collector current**

$di_F/dt$, $di_{rr}/dt$ = f( $I_C$)



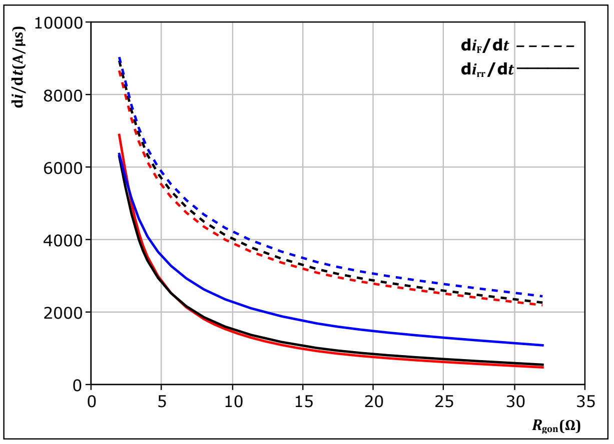

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | 0/15 | V | | 125 °C |
| $R_{gon}$ = | 8 | Ω | | 150 °C |

**figure 92.** **FWD**

**Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor**

$di_F/dt$, $di_{rr}/dt$ = f( $R_{gon}$)



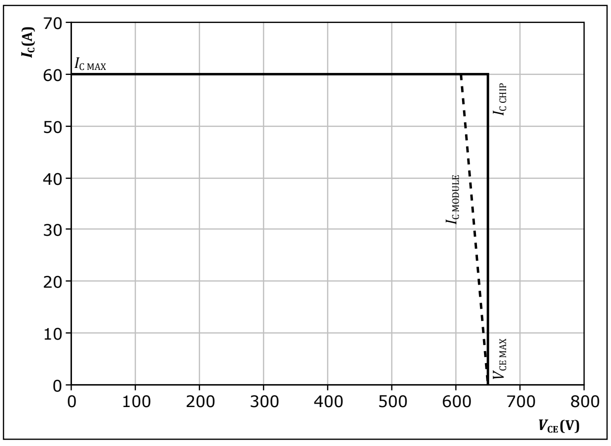

With an inductive load at

| | | | | |
|---|---|---|---|---|
| $V_{CE}$ = | 400 | V | $T_j$: | 25 °C |
| $V_{GE}$ = | 0/15 | V | | 125 °C |
| $I_C$ = | 30 | A | | 150 °C |

**figure 93.** **IGBT**

**Reverse bias safe operating area**

$I_C$ = f( $V_{CE}$)




| | | | |
|---|---|---|---|
| **At** | $T_j$ = | 150 | °C |
| | $R_{gon}$ = | 8 | Ω |
| | $R_{goff}$ = | 8 | Ω |

# Switching Definitions

**figure 94.** **IGBT**

**Turn-off Switching Waveforms & definition of** $t_{doff}$, $t_{Eoff}$ ($t_{tEoff}$ = integrating time for $E_{off}$)

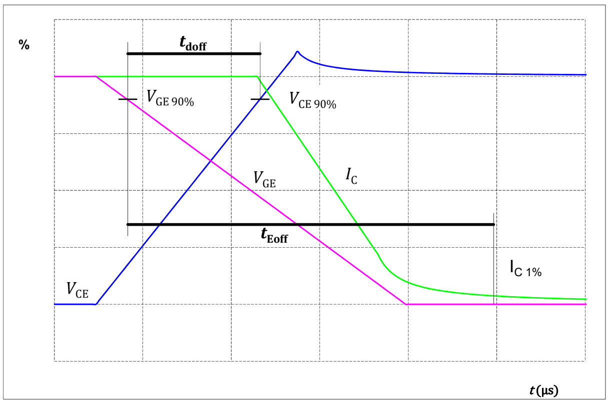



**figure 95.** **IGBT**

**Turn-on Switching Waveforms & definition of** $t_{don}$, $t_{Eon}$ ($t_{Eon}$ = integrating time for $E_{on}$)

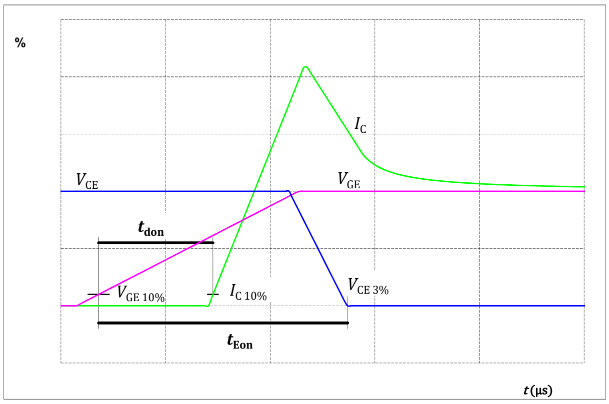



**figure 96.** **IGBT**

**Turn-off Switching Waveforms & definition of** $t_f$

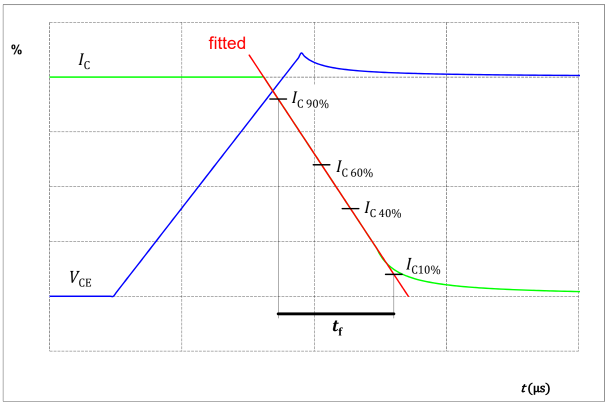
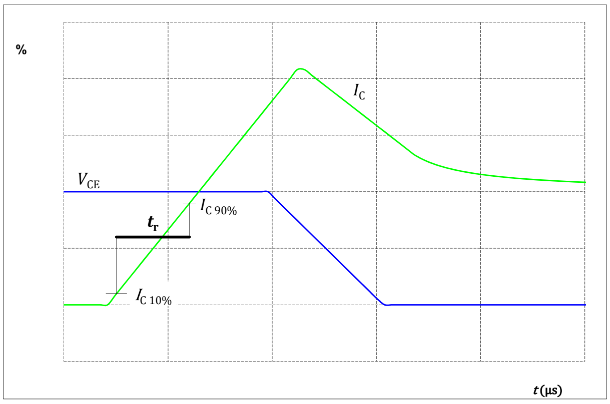



**figure 97.** **IGBT**

**Turn-on Switching Waveforms & definition of** $t_r$



# Switching Definitions

**figure 98.** **FWD**

**Turn-off Switching Waveforms & definition of $t_{rr}$**

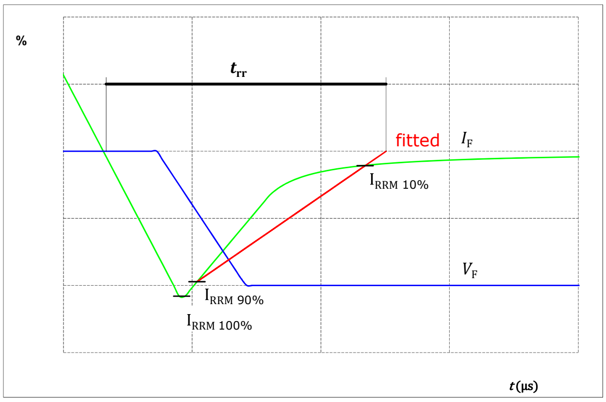
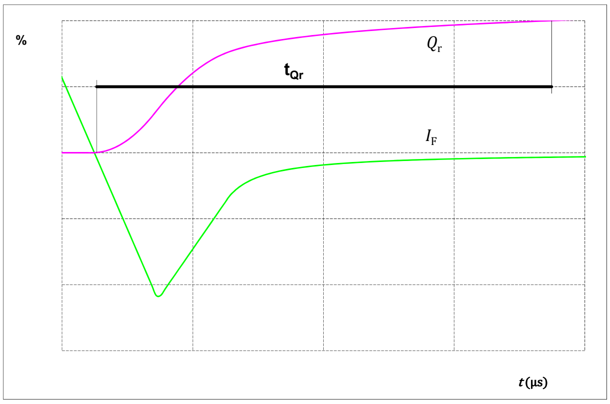



**figure 99.** **FWD**

**Turn-on Switching Waveforms & definition of $t_{Qr}$ ($t_{Qr}$ = integrating time for $Q_r$)**



# 10-PY07BVA030RW-LF42E28Y
datasheet

Vincotech

## Ordering Code

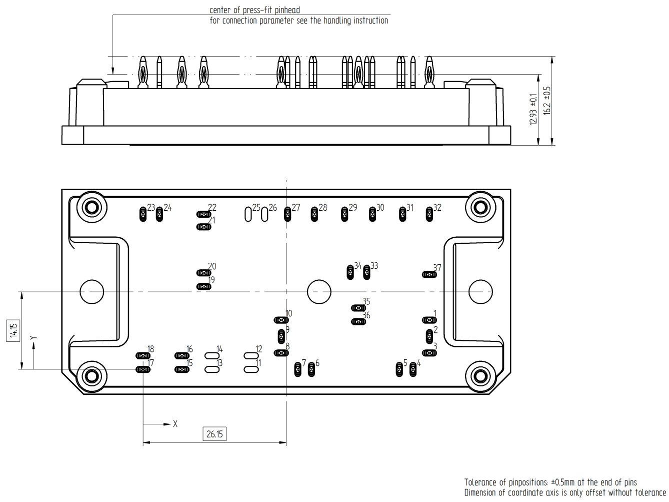
| Version | Ordering Code |
|---|---|
| Without thermal paste | 10-PY07BVA030RW-LF42E28Y |
| With thermal paste (5,2 W/mK, PTM6000HV) | 10-PY07BVA030RW-LF42E28Y-/7/ |
| With thermal paste (3,4 W/mK, PSX-P7) | 10-PY07BVA030RW-LF42E28Y-/3/ |

## Marking

| | | Name | | Date code | UL & VIN | Lot | Serial |
|---|---|---|---|---|---|---|---|
|  | **Text** | NN-NNNNNNNNNNNNNN-TTTTTTTVV | | WWYY | UL VIN | LLLLL | SSSS |
| | **Datamatrix** | **Type&Ver** | **Lot number** | **Serial** | **Date code** | | |
| | | TTTTTTTVV | LLLLL | SSSS | WWYY | | |

## Outline

| Pin table [mm] | | | |
|---|---|---|---|
| Pin | X | Y | Function |
| 1 | 52,3 | 9 | G22 |
| 2 | 52,3 | 6 | S14 |
| 3 | 52,3 | 3 | G14 |
| 4 | 49,3 | 0 | Ph2 |
| 5 | 46,8 | 0 | Ph2 |
| 6 | 30,75 | 0 | Ph1 |
| 7 | 28,25 | 0 | Ph1 |
| 8 | 25,25 | 3 | G12 |
| 9 | 25,25 | 6 | S12 |
| 10 | 25,25 | 9 | G21 |
| 11 | not assembled | | |
| 12 | not assembled | | |
| 13 | not assembled | | |
| 14 | not assembled | | |
| 15 | 7,1 | 0 | DC+In1 |
| 16 | 7,1 | 2,5 | DC+In1 |
| 17 | 0 | 0 | Boost1 |
| 18 | 0 | 2,5 | Boost1 |
| 19 | 11,1 | 15,1 | DC+Boost |
| 20 | 11,1 | 17,6 | DC+Boost |
| 21 | 11,1 | 26 | DC-Boost |
| 22 | 11,1 | 28,3 | DC-Boost |
| 23 | 0 | 28,3 | G25 |
| 24 | 3 | 28,3 | S25 |
| 25 | not assembled | | |
| 26 | not assembled | | |
| 27 | 26,4 | 28,3 | G11 |
| 28 | 31,3 | 28,3 | S11 |
| 29 | 36,8 | 28,3 | Therm1 |
| 30 | 41,9 | 28,3 | Therm2 |
| 31 | 47,4 | 28,3 | S13 |
| 32 | 52,3 | 28,3 | G13 |
| 33 | 40,85 | 17,7 | DC-2 |
| 34 | 37,85 | 17,7 | DC-1 |
| 35 | 39,35 | 11,2 | DC+ |
| 36 | 39,35 | 8,7 | DC+ |
| 37 | 52,3 | 17,3 | A20 |



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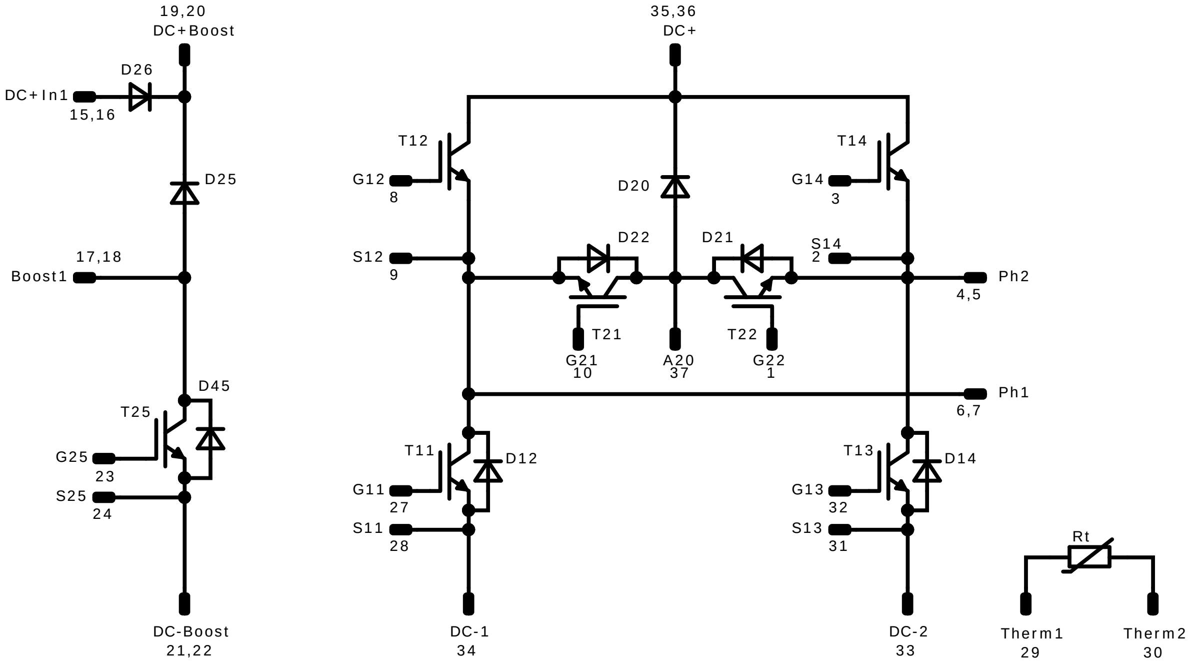
## Pinout




## Identification

| ID | Component | Voltage | Current | Function | Comment |
|---|---|---|---|---|---|
| T11, T13 | IGBT | 650 V | 30 A | Low Buck Switch | |
| T12, T14 | IGBT | 650 V | 30 A | High Buck Switch | |
| D22, D21 | FWD | 650 V | 20 A | Buck Diode | |
| T21, T22 | IGBT | 650 V | 20 A | Boost Switch | |
| D14, D12 | FWD | 650 V | 20 A | Low Boost Diode | |
| D20 | FWD | 650 V | 20 A | High Boost Diode | |
| T25 | IGBT | 650 V | 30 A | Input Boost Switch | |
| D25 | FWD | 650 V | 30 A | Input Boost Diode | |
| D45 | FWD | 650 V | 10 A | Input Boost Sw. Protection Diode | |
| D26 | Rectifier | 1600 V | 35 A | ByPass Diode | |
| Rt | NTC | | | Thermistor | |

| Packaging instruction | | | | |
|---|---|---|---|---|
| Standard packaging quantity (SPQ) 100 | >SPQ | Standard | <SPQ | Sample |

| Handling instruction |
|---|
| Handling instructions for *flow* 1 packages see vincotech.com website. |

| Package data |
|---|
| Package data for *flow* 1 packages see vincotech.com website. |

| Vincotech thermistor reference |
|---|
| See Vincotech thermistor reference table at vincotech.com website. |

| UL recognition and file number |
|---|
| This device is certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website. |

| Document No.: | Date: | Modification: | Pages |
|---|---|---|---|
| 10-PY07BVA030RW-LF42E28Y-D3-14 | 1 May. 2022 | New Datasheet format, module is unchanged | |