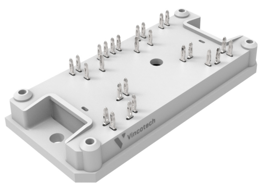
10-PY12B2A080N3-LP26L26Y
datasheet

***flow*BOOST 1 dual** **1200 V / 80 A**

Features

- Dual Booster
- High Performance Flying Capacitor Topology
- Latest IGBT & SiC Technology
- Integrated flying snubber capacitor
- Integrated NTC
- Low Inductance Design

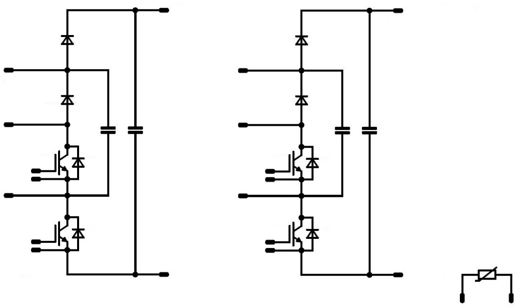
flow 1 12 mm housing



Target applications

- Solar Inverters

Schematic



Types

- 10-PY12B2A080N3-LP26L26Y

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Inner Boost Switch					
Collector-emitter voltage	V_{CES}			1200	V
Collector current	I_C	$T_j = T_{jmax}$	T_s = 80 °C	68	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		320	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	138	W
Gate-emitter voltage	V_{GES}			±20	V
Maximum junction temperature	T_{jmax}			175	°C
Outer Boost Switch					
Collector-emitter voltage	V_{CES}			1200	V
Collector current	I_C	$T_j = T_{jmax}$	T_s = 80 °C	68	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		320	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	138	W
Gate-emitter voltage	V_{GES}			±20	V
Maximum junction temperature	T_{jmax}			175	°C
Inner Boost Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$	T_s = 80 °C	39	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		141	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms		213	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	105	W
Maximum junction temperature	T_{jmax}			175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Outer Boost Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$	T_s = 80 °C	39	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		141	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms		213	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	105	W
Maximum junction temperature	T_{jmax}			175	°C
Inner Boost Sw. Protection Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$	T_s = 80 °C	40	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		70	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	75	W
Maximum junction temperature	T_{jmax}			175	°C
Outer Boost Sw. Protection Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$	T_s = 80 °C	40	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		70	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	75	W
Maximum junction temperature	T_{jmax}			175	°C
Flying Capacitor					
Maximum DC voltage	V_{MAX}			1000	V
Operation Temperature	T_{op}			0 … 125	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Capacitor (DC)					
Maximum DC voltage	V_{MAX}			1500	V
Operation Temperature	T_{op}			0 … 125	°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				min. 12,7	mm
Clearance				12,02	mm
Comparative Tracking Index	CTI			≥ 600	

*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]	Values Min	Typ	Max	Unit
Inner Boost Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0008	25	4,5	5,5	6,5	V
Collector-emitter saturation voltage	V_{CEsat}		15		80	25 125 150		1,9 2,06 2,11	1,95(1)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			800	µA
Gate-emitter leakage current	I_{GES}		20	0		25			400	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	f = 1 Mhz	0	20		25		9824		pF
Output capacitance	C_{oes}							280		pF
Reverse transfer capacitance	C_{res}							160		pF
Gate charge	Q_g		15	600	80	25		424		nC
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,69		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 4 Ω R_{goff} = 4 Ω	±15	700	65	25 125 150		91,52 91,52 91,2		ns
Rise time	t_r					25 125 150		16,64 17,92 18,24		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		143,04 173,12 181,44		ns
Fall time	t_f					25 125 150		37,74 76,79 91,22		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,236 µC Q_{rFWD}=0,245 µC Q_{rFWD}=0,243 µC				25 125 150		1,03 1,14 1,18		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		1,91 3,23 3,61		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	
Outer Boost Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0008	25	4,5	5,5	6,5	V
Collector-emitter saturation voltage	V_{CEsat}		15		80	25 125 150		1,9 2,06 2,11	1,95(1)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			800	µA
Gate-emitter leakage current	I_{GES}		20	0		25			400	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}							9824		pF
Output capacitance	C_{oes}	f = 1 Mhz	0	20		25		280		pF
Reverse transfer capacitance	C_{res}							160		pF
Gate charge	Q_g		15	600	80	25		424		nC
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,69		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$					25 125 150		91,52 91,52 91,2		ns
Rise time	t_r	R_{gon} = 4 Ω R_{goff} = 4 Ω				25 125 150		16,64 17,92 18,24		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		143,04 173,12 181,44		ns
Fall time	t_f		±15	700	65	25 125 150		37,74 76,79 91,22		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,236 µC Q_{rFWD}=0,245 µC Q_{rFWD}=0,243 µC				25 125 150		1,03 1,14 1,18		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		1,91 3,23 3,61		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	
Inner Boost Diode										
Static										
Forward voltage	V_F				30	25 125 150		1,51 2,03 2,13	1,8 (1)	V
Reverse leakage current	I_R	V_r = 1200 V				25		90	750	µA
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,9		K/W
Dynamic										
Peak recovery current	I_{RRM}	d*i*/d*t*=4090 A/µs d*i*/d*t*=3892 A/µs d*i*/d*t*=3769 A/µs	±15	700	65	25 125 150		22,86 21,05 20,85		A
Reverse recovery time	t_{rr}					25 125 150		13,26 15,09 15,11		ns
Recovered charge	Q_r					25 125 150		0,236 0,245 0,243		µC
Reverse recovered energy	E_{rec}					25 125 150		0,094 0,102 0,101		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		4077 3533 3445		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
Outer Boost Diode										
Static										
Forward voltage	V_F				30	25 125 150		1,51 2,03 2,13	1,8[1]	V
Reverse leakage current	I_R	V_r = 1200 V				25		90	750	µA
Thermal										
Thermal resistance junction to sink [2]	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,9		K/W
Dynamic										
Peak recovery current	I_{RRM}	d*i*/d*t*=4090 A/µs d*i*/d*t*=3892 A/µs d*i*/d*t*=3769 A/µs	±15	700	65	25 125 150		22,86 21,05 20,85		A
Reverse recovery time	t_{rr}					25 125 150		13,26 15,09 15,11		ns
Recovered charge	Q_r					25 125 150		0,236 0,245 0,243		µC
Reverse recovered energy	E_{rec}					25 125 150		0,094 0,102 0,101		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		4077 3533 3445		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	
Inner Boost Sw. Protection Diode										
Static										
Forward voltage	V_F				35	25 125 150		1,66 1,76 1,74	2,1(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25			40	µA
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,27		K/W
Outer Boost Sw. Protection Diode										
Static										
Forward voltage	V_F				35	25 125 150		1,66 1,76 1,74	2,1(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25			40	µA
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,27		K/W
Flying Capacitor										
Static										
Capacitance	C							47		nF
Tolerance							-10		10	%

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	
Capacitor (DC)										
Static										
Capacitance	C							33		nF
Tolerance							-10		10	%
Dissipation factor		f = 1 kHz				25		2,5		%
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							5		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

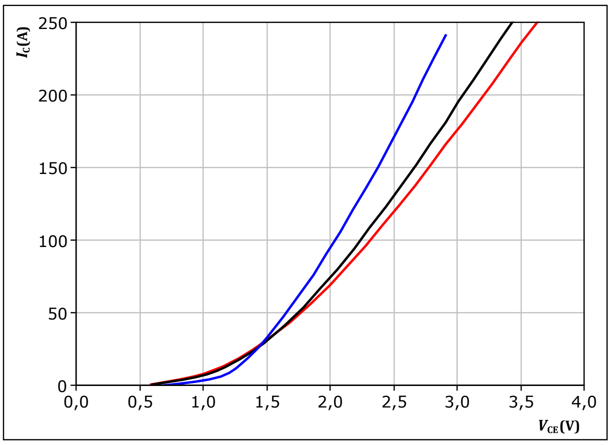
(2) Only valid with pre-applied Vincotech thermal interface material.

Inner Boost Switch Characteristics

figure 1. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$

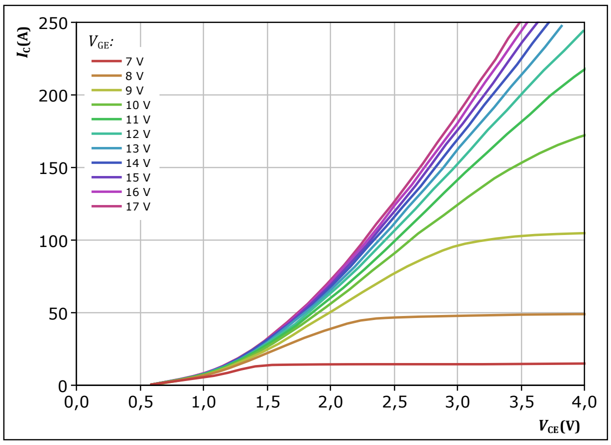


t_p =	250	µs		25 °C
V_{GE} =	15	V	T_j:	125 °C
				150 °C

figure 2. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$



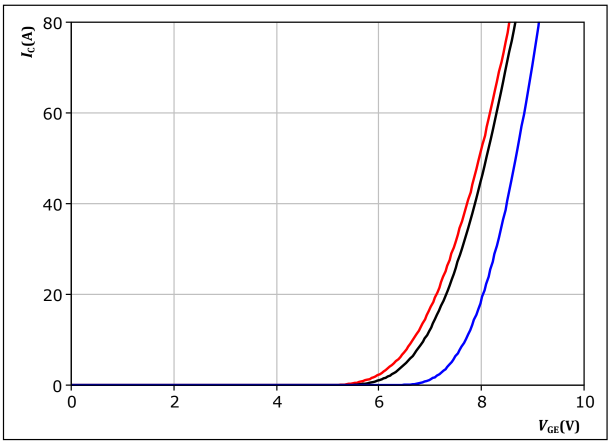
t_p =	250	µs
T_j =	150	°C

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

figure 3. **IGBT**

Typical transfer characteristics

$I_C = f(V_{GE})$

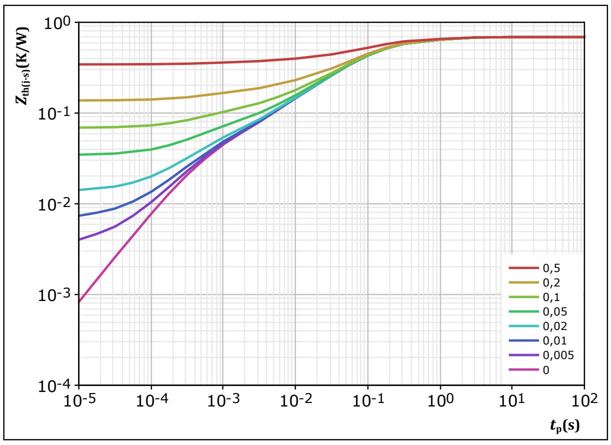


t_p =	250	µs		25 °C
V_{CE} =	10	V	T_j:	125 °C
				150 °C

figure 4. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,687	K/W

IGBT thermal model values

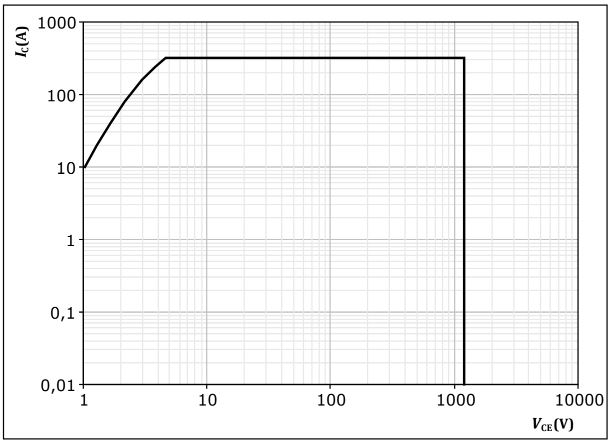
R (K/W)	τ (s)
1,16E-01	1,00E+00
3,47E-01	1,15E-01
1,38E-01	3,11E-02
5,25E-02	5,14E-03
3,27E-02	4,97E-04

Inner Boost Switch Characteristics

figure 5.	**IGBT**

Safe operating area

I_C = f(V_{CE})



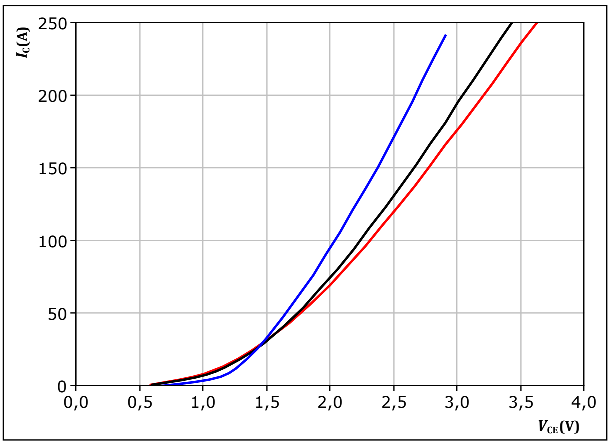
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Outer Boost Switch Characteristics

figure 6. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

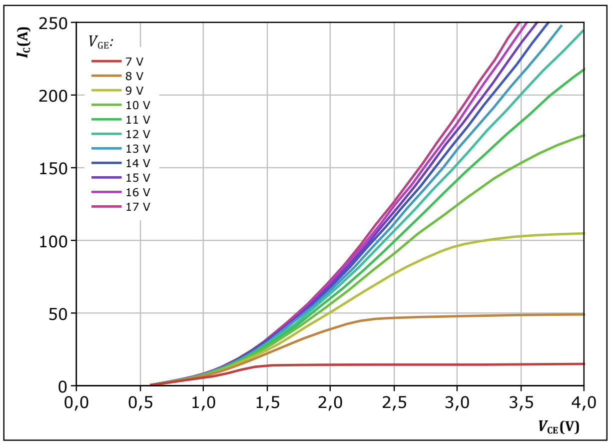


t_p =	250	µs		25 °C
V_{GE} =	15	V	T_j:	125 °C
				150 °C

figure 7. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



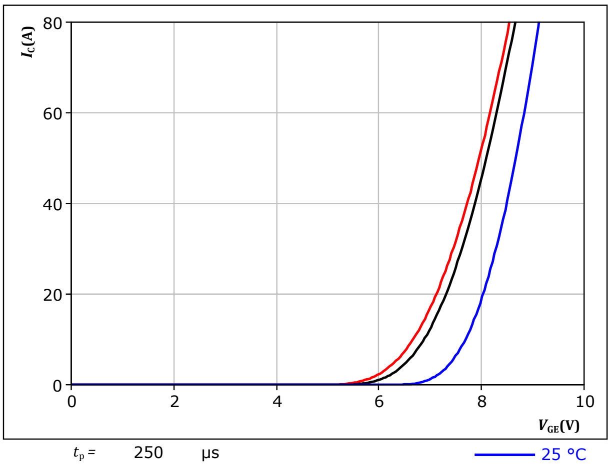
t_p =	250	µs
T_j =	150	°C

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

figure 8. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})

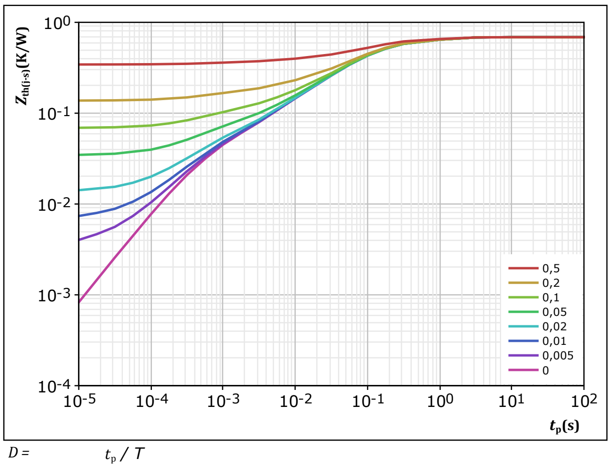


t_p =	250	µs		25 °C
V_{CE} =	10	V	T_j:	125 °C
				150 °C

figure 9. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,687	K/W

IGBT thermal model values

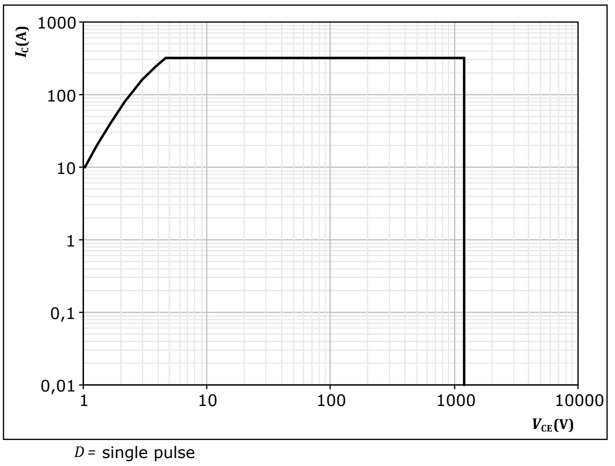
R (K/W)	τ (s)
1,16E-01	1,00E+00
3,47E-01	1,15E-01
1,38E-01	3,11E-02
5,25E-02	5,14E-03
3,27E-02	4,97E-04

Outer Boost Switch Characteristics

figure 10. **IGBT**

Safe operating area

I_C = f(V_{CE})



D = single pulse

T_s = 80 °C

V_{GE} = 15 V

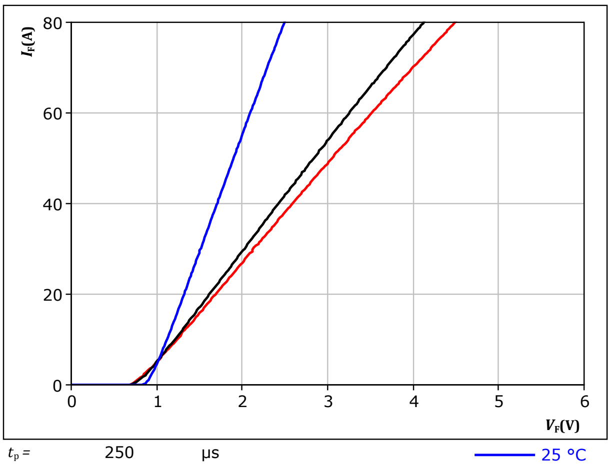
T_j = T_{jmax}

Inner Boost Diode Characteristics

figure 11. FWD

Typical forward characteristics

I_F = f(V_F)



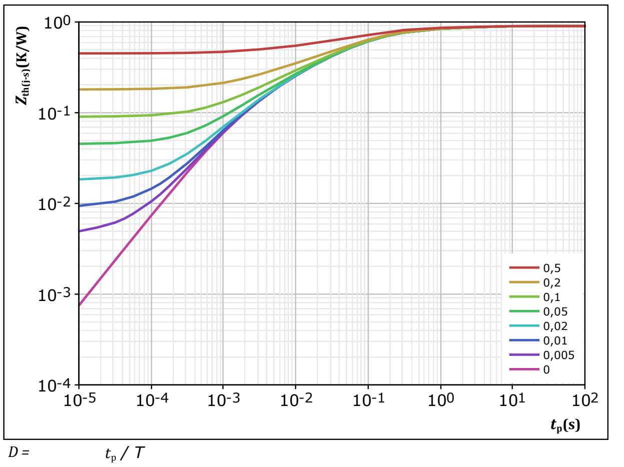
t_p = 250 µs

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

$R_{th(j-s)}$ = 0,901 K/W

FWD thermal model values

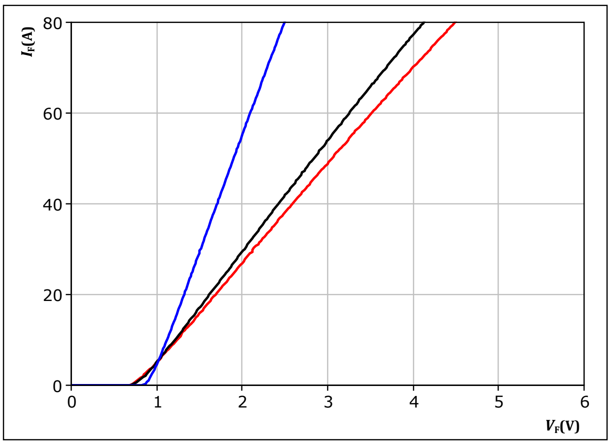
R (K/W)	τ (s)
6,65E-02	3,02E+00
1,53E-01	3,98E-01
4,06E-01	7,42E-02
2,08E-01	9,81E-03
6,71E-02	1,40E-03

Outer Boost Diode Characteristics

figure 13. **FWD**

Typical forward characteristics

I_F = f(V_F)



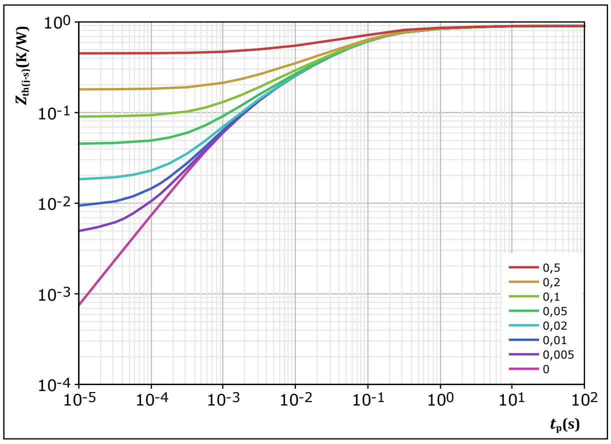
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 14. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 0,901 K/W

FWD thermal model values

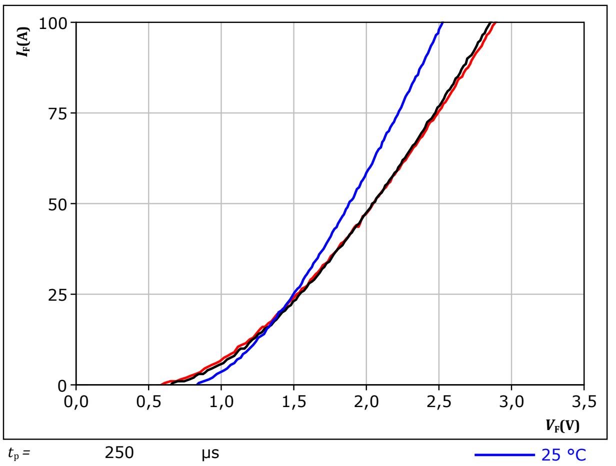
R (K/W)	τ (s)
6,65E-02	3,02E+00
1,53E-01	3,98E-01
4,06E-01	7,42E-02
2,08E-01	9,81E-03
6,71E-02	1,40E-03

Inner Boost Sw. Protection Diode Characteristics

figure 15. **FWD**

Typical forward characteristics

I_F = f(V_F)



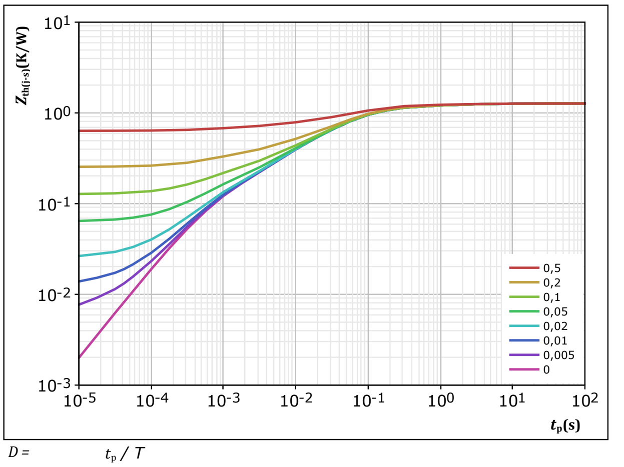
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 16. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,269 K/W

FWD thermal model values

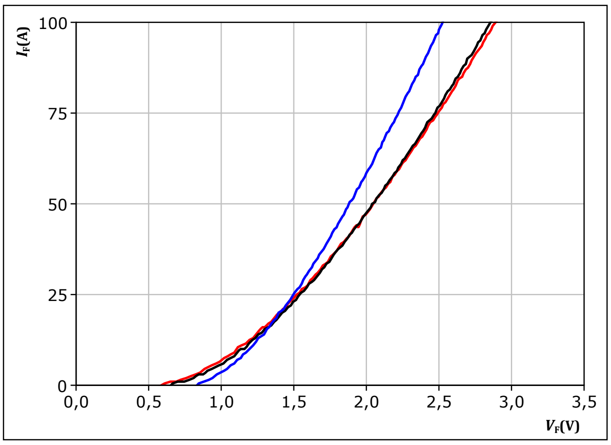
R (K/W)	τ (s)
5,82E-02	3,40E+00
1,11E-01	5,24E-01
4,63E-01	9,20E-02
3,72E-01	2,94E-02
1,72E-01	5,46E-03
9,36E-02	6,17E-04

Outer Boost Sw. Protection Diode Characteristics

figure 17. FWD

Typical forward characteristics

I_F = f(V_F)



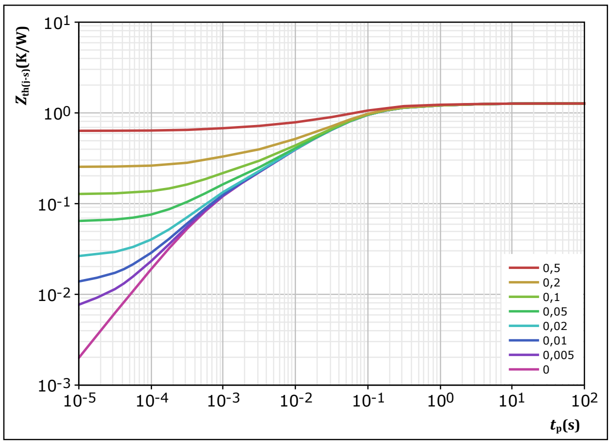
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 18. FWD

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,269 K/W

FWD thermal model values

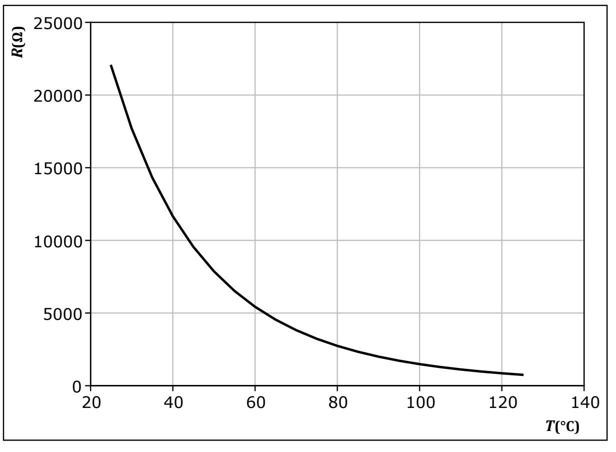
R (K/W)	τ (s)
5,82E-02	3,40E+00
1,11E-01	5,24E-01
4,63E-01	9,20E-02
3,72E-01	2,94E-02
1,72E-01	5,46E-03
9,36E-02	6,17E-04

Thermistor Characteristics

figure 19.	Thermistor

Typical NTC characteristic as function of temperature

R_T = f(T)

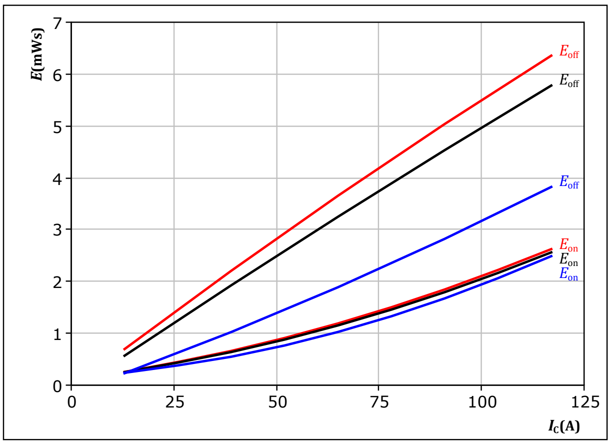


Inner Boost Switching Characteristics

figure 20. IGBT

Typical switching energy losses as a function of collector current

$E = f(I_C)$



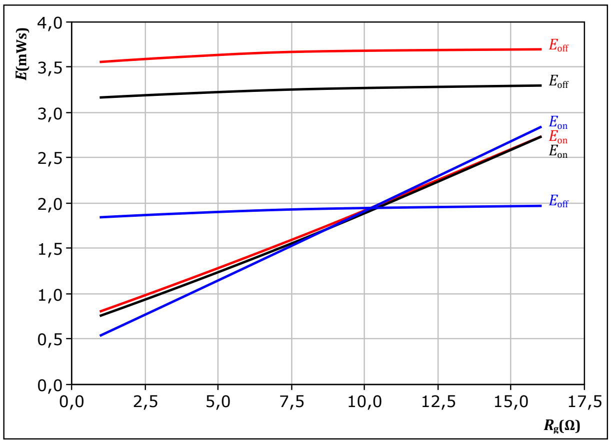
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C
R_{goff} =	4	Ω		

figure 21. IGBT

Typical switching energy losses as a function of gate resistor

$E = f(R_g)$



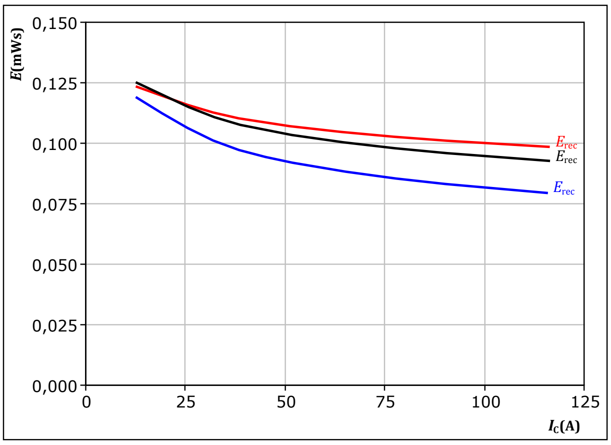
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	65	A		150 °C

figure 22. FWD

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



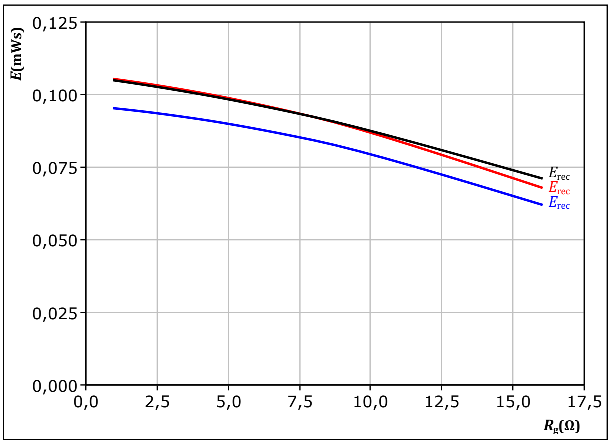
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 23. FWD

Typical reverse recovered energy loss as a function of gate resistor

$E_{rec} = f(R_g)$



With an inductive load at

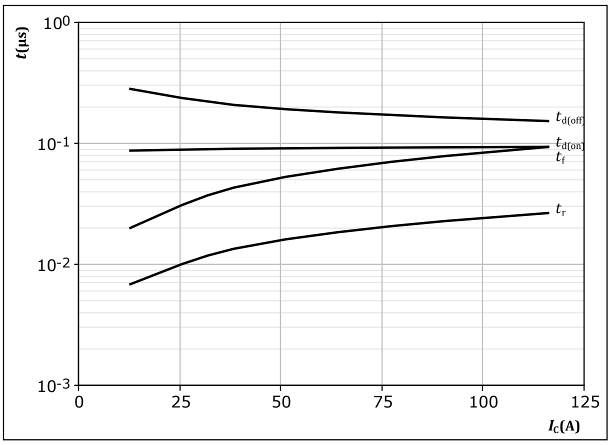
V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	65	A		150 °C

Inner Boost Switching Characteristics

figure 24. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



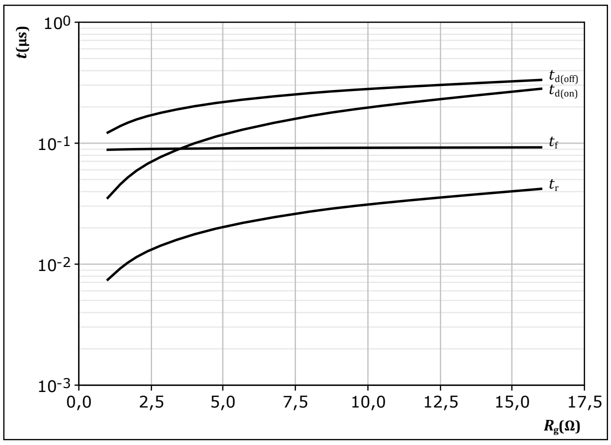
With an inductive load at

T_j =	150	°C
V_{CE} =	700	V
V_{GE} =	±15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 25. **IGBT**

Typical switching times as a function of gate resistor

$t = f(R_g)$



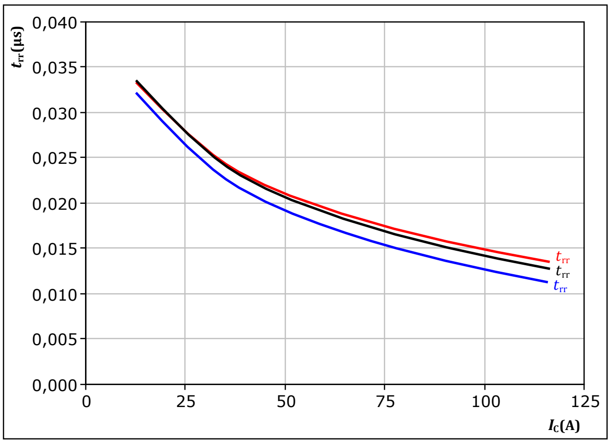
With an inductive load at

T_j =	150	°C
V_{CE} =	700	V
V_{GE} =	±15	V
I_C =	65	A

figure 26. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

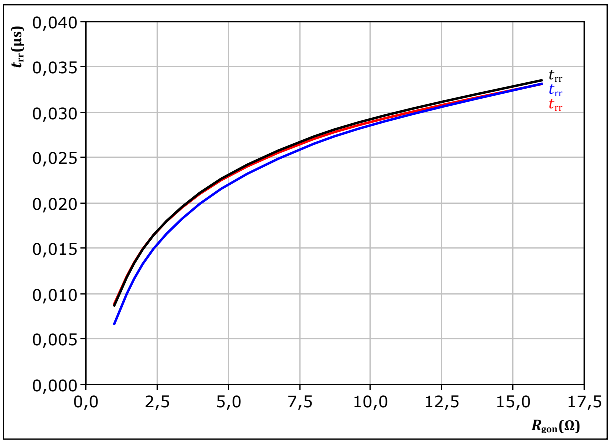
V_{CE} =	700	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 27. **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} =	700	V
V_{GE} =	±15	V
I_C =	65	A

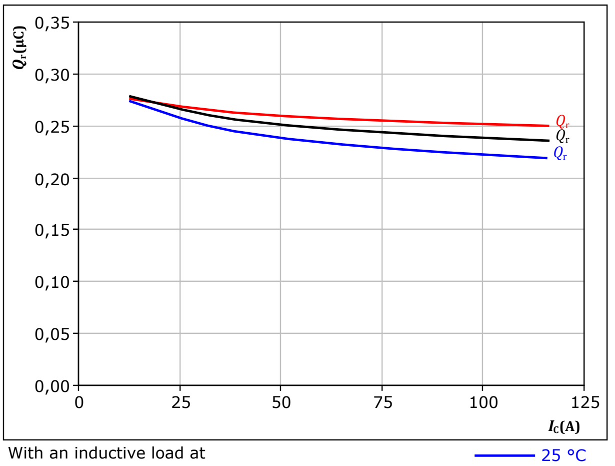
T_j: 25 °C, 125 °C, 150 °C

Inner Boost Switching Characteristics

figure 28. FWD

Typical recovered charge as a function of collector current

Q_r = f(I_C)



With an inductive load at

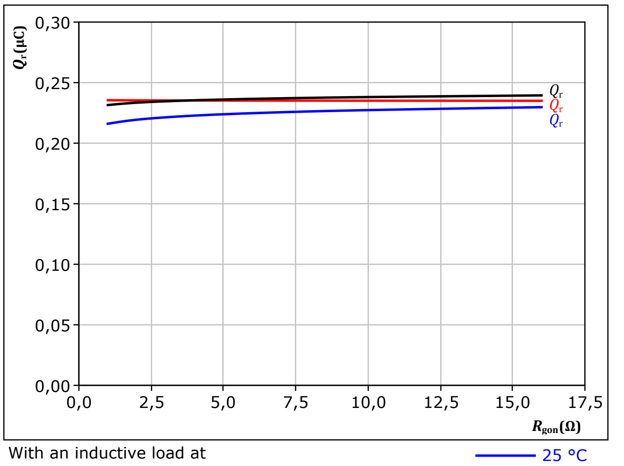
V_{CE} = 700 V
V_{GE} = ±15 V
R_{gon} = 4 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 29. FWD

Typical recovered charge as a function of turn on gate resistor

Q_r = f(R_{gon})



With an inductive load at

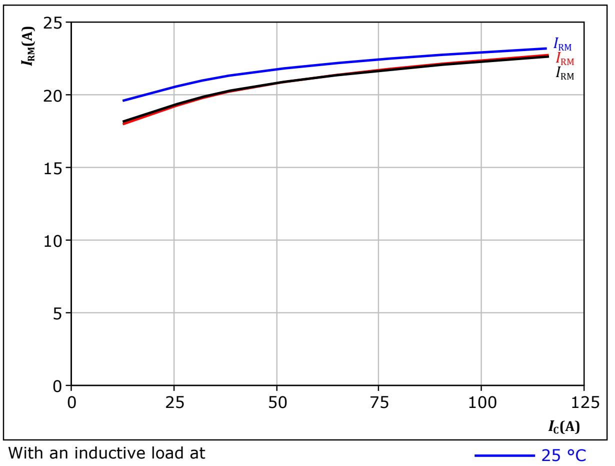
V_{CE} = 700 V
V_{GE} = ±15 V
I_C = 65 A

T_j: 25 °C, 125 °C, 150 °C

figure 30. FWD

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



With an inductive load at

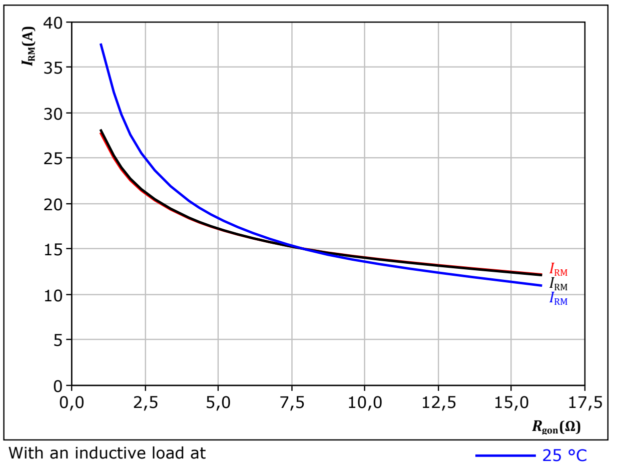
V_{CE} = 700 V
V_{GE} = ±15 V
R_{gon} = 4 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 31. FWD

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

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



With an inductive load at

V_{CE} = 700 V
V_{GE} = ±15 V
I_C = 65 A

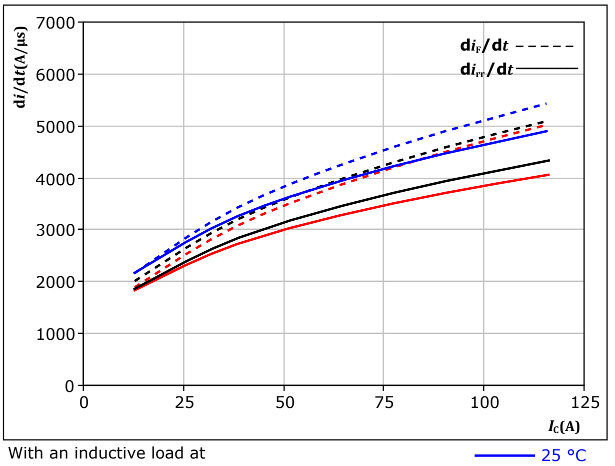
T_j: 25 °C, 125 °C, 150 °C

Inner Boost Switching Characteristics

figure 32. **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)



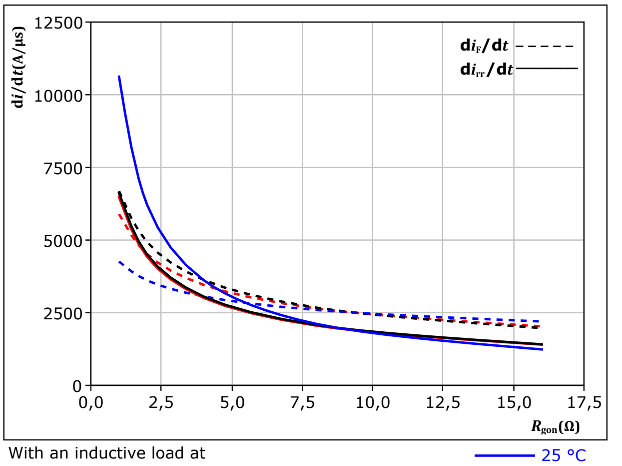
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 33. **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})



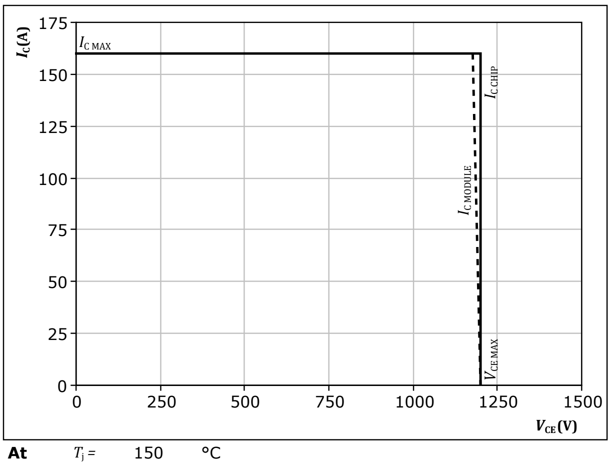
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	65	A		150 °C

figure 34. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



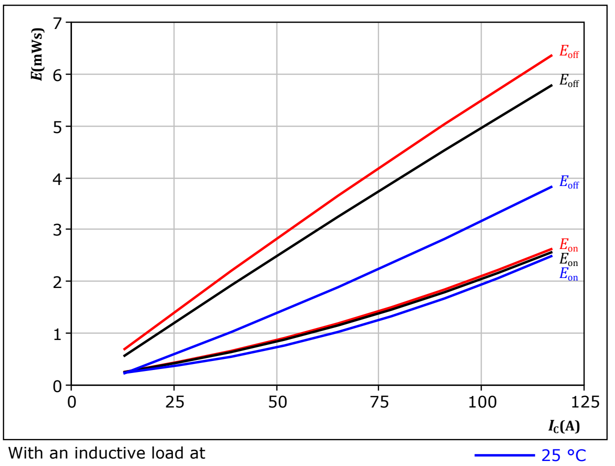
At	T_j =	150	°C
	R_{gon} =	4	Ω
	R_{goff} =	4	Ω

Outer Boost Switching Characteristics

figure 35. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



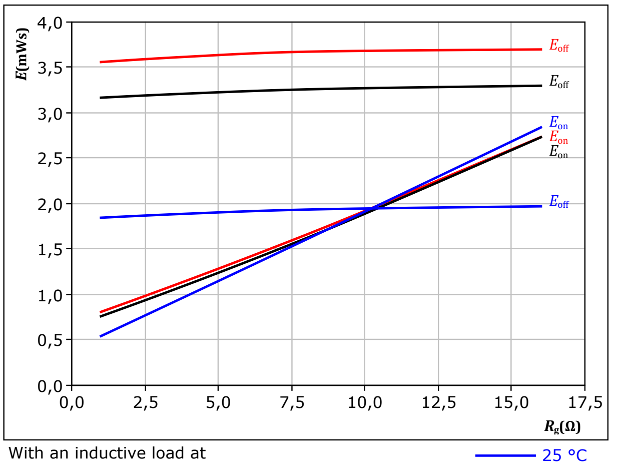
With an inductive load at

			T_j:
V_{CE} =	700	V	25 °C
V_{GE} =	±15	V	125 °C
R_{gon} =	4	Ω	150 °C
R_{goff} =	4	Ω	

figure 36. **IGBT**

Typical switching energy losses as a function of gate resistor

$E = f(R_g)$



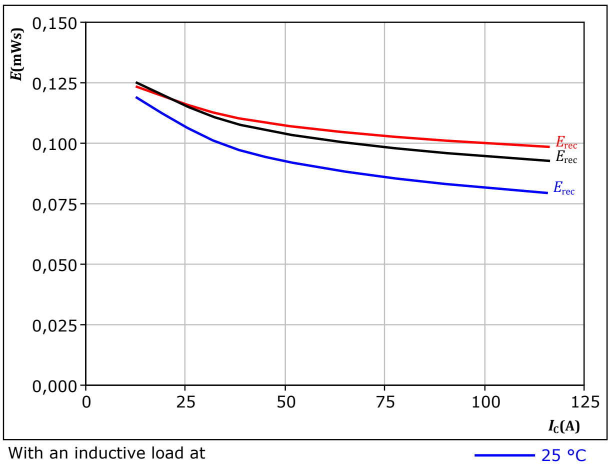
With an inductive load at

			T_j:
V_{CE} =	700	V	25 °C
V_{GE} =	±15	V	125 °C
I_C =	65	A	150 °C

figure 37. **FWD**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



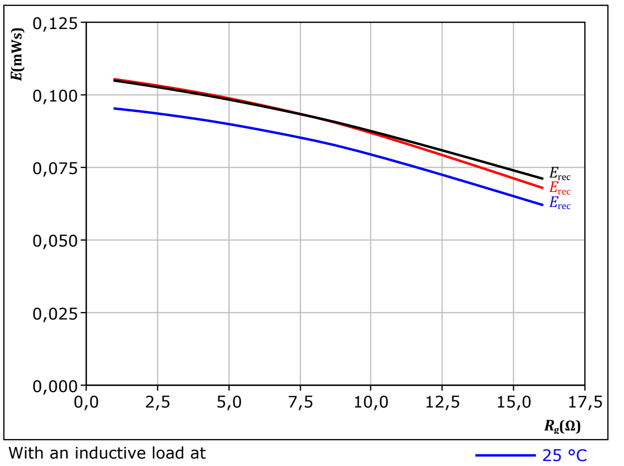
With an inductive load at

			T_j:
V_{CE} =	700	V	25 °C
V_{GE} =	±15	V	125 °C
R_{gon} =	4	Ω	150 °C

figure 38. **FWD**

Typical reverse recovered energy loss as a function of gate resistor

$E_{rec} = f(R_g)$



With an inductive load at

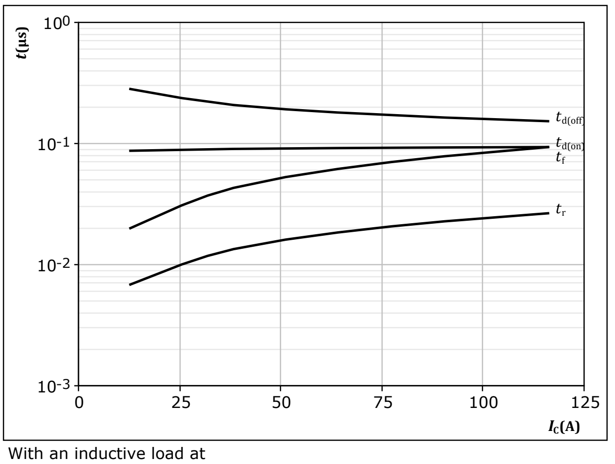
			T_j:
V_{CE} =	700	V	25 °C
V_{GE} =	±15	V	125 °C
I_C =	65	A	150 °C

Outer Boost Switching Characteristics

figure 39. **IGBT**

Typical switching times as a function of collector current

t = f(I_C)



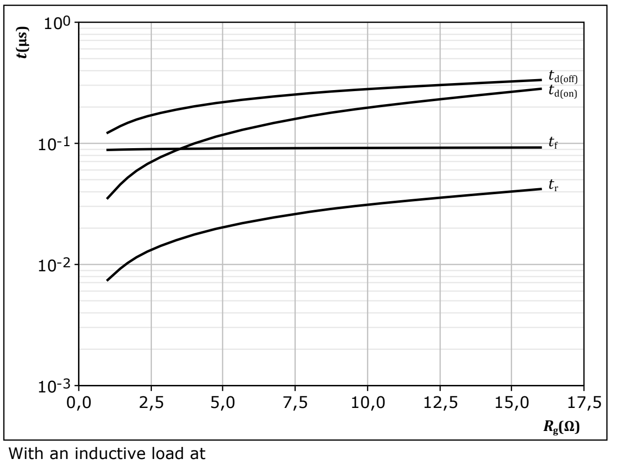
With an inductive load at

T_j =	150	°C
V_{CE} =	700	V
V_{GE} =	±15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 40. **IGBT**

Typical switching times as a function of gate resistor

t = f(R_g)



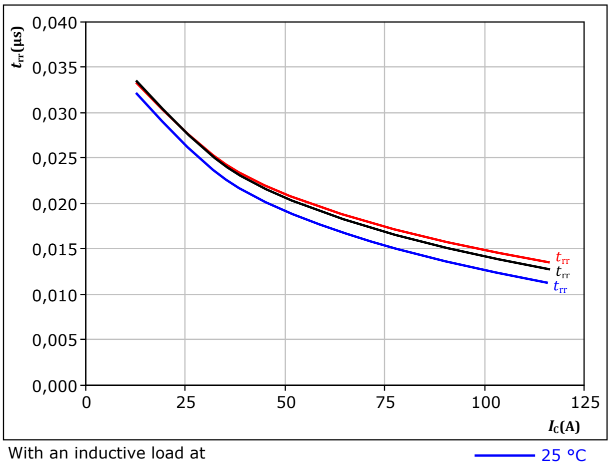
With an inductive load at

T_j =	150	°C
V_{CE} =	700	V
V_{GE} =	±15	V
I_C =	65	A

figure 41. **FWD**

Typical reverse recovery time as a function of collector current

t_{rr} = f(I_C)



With an inductive load at

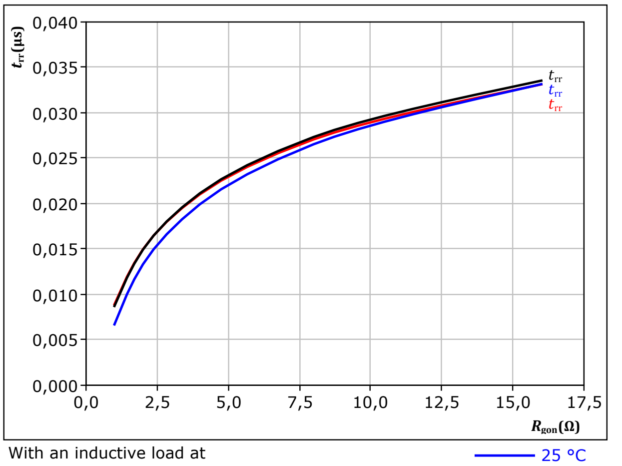
V_{CE} =	700	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 42. **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} =	700	V
V_{GE} =	±15	V
I_C =	65	A

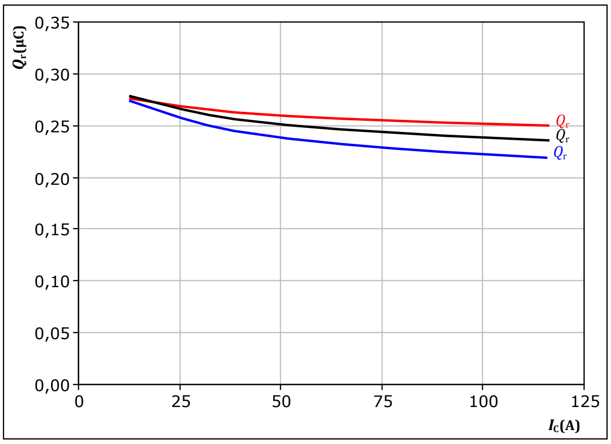
T_j: 25 °C, 125 °C, 150 °C

Outer Boost Switching Characteristics

figure 43. **FWD**

Typical recovered charge as a function of collector current

Q_r = f(I_C)



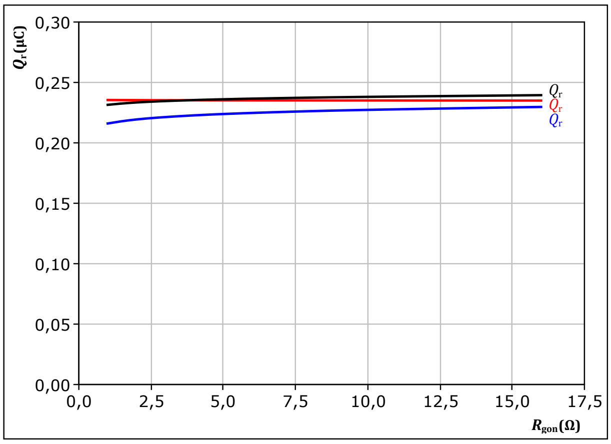
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 44. **FWD**

Typical recovered charge as a function of turn on gate resistor

Q_r = f(R_{gon})



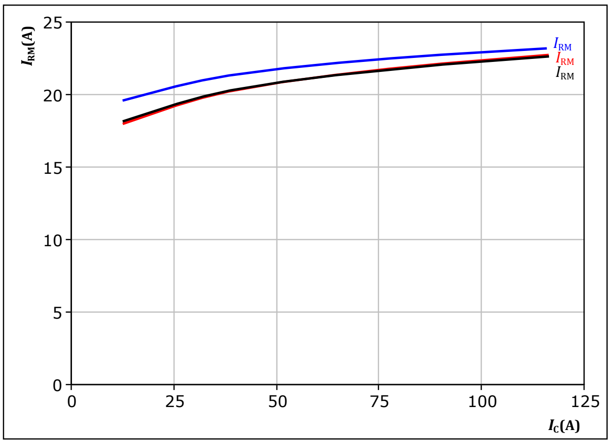
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	65	A		150 °C

figure 45. **FWD**

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



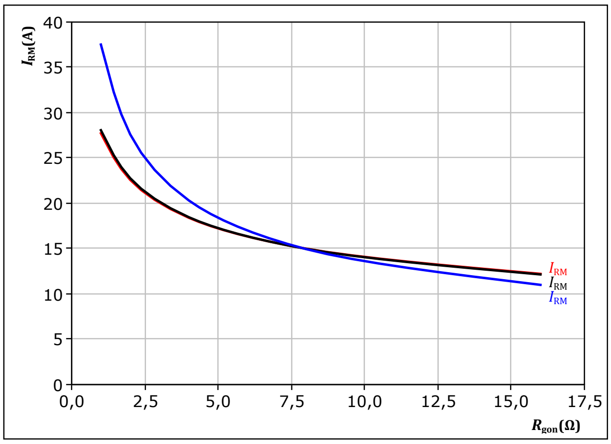
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 46. **FWD**

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

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



With an inductive load at

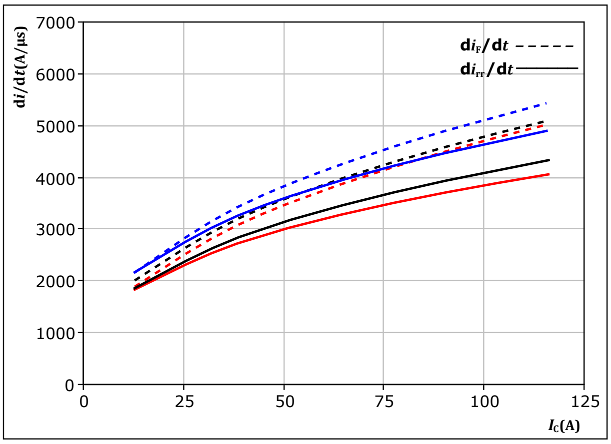
V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	65	A		150 °C

Outer Boost Switching Characteristics

figure 47. **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)



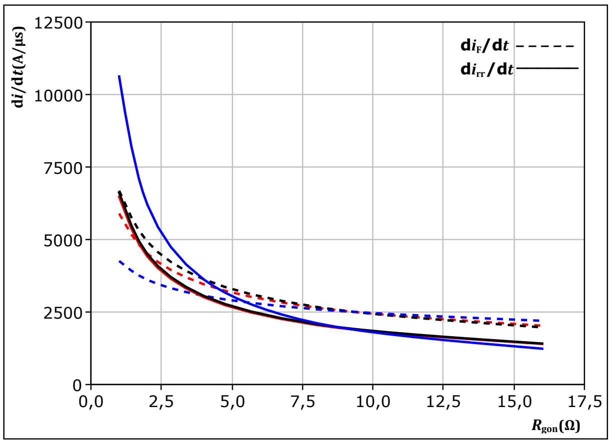
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 48. **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})



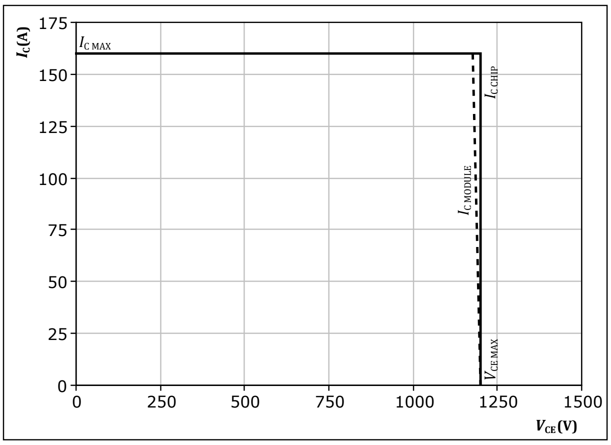
With an inductive load at

V_{CE} =	700	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	65	A		150 °C

figure 49. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



At	T_j =	150	°C
	R_{gon} =	4	Ω
	R_{goff} =	4	Ω

Switching Definitions

figure 50. **IGBT**

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

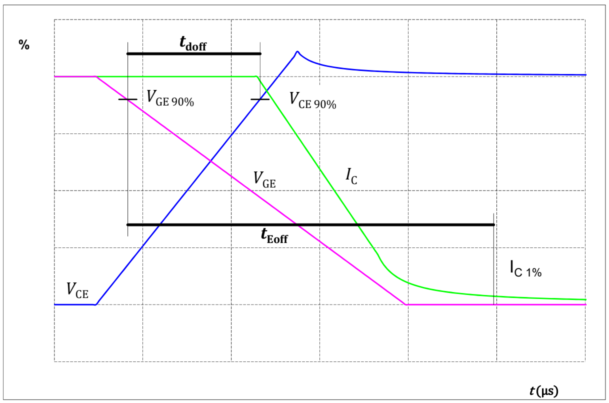


figure 51. **IGBT**

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

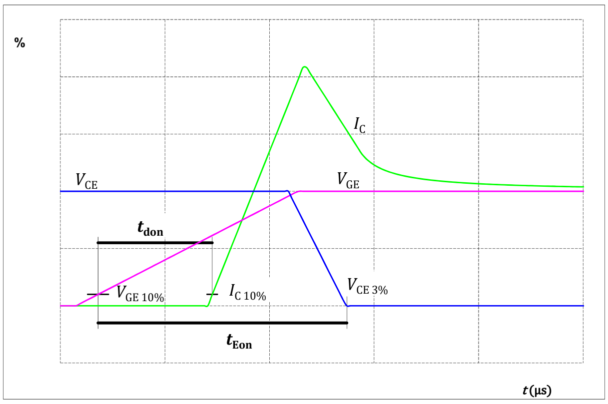


figure 52. **IGBT**

Turn-off Switching Waveforms & definition of t_f

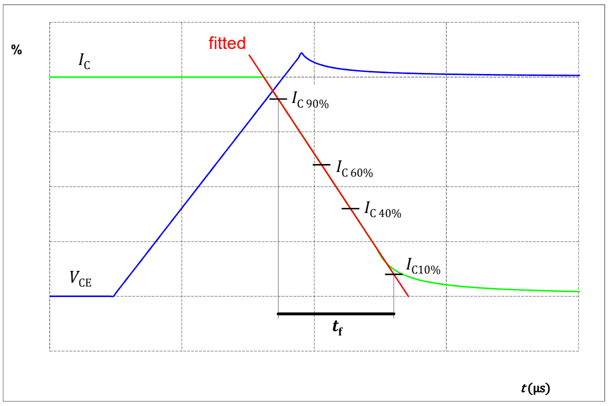
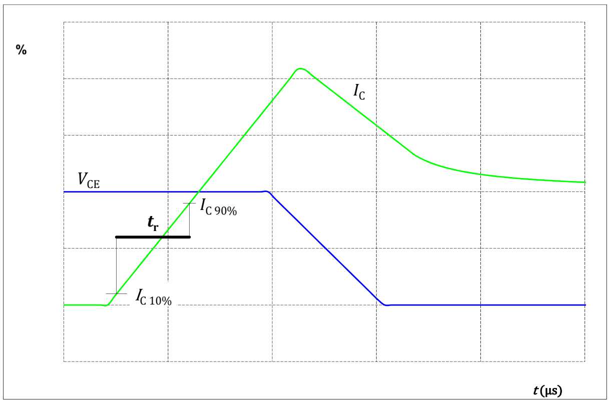


figure 53. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 54. **FWD**

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

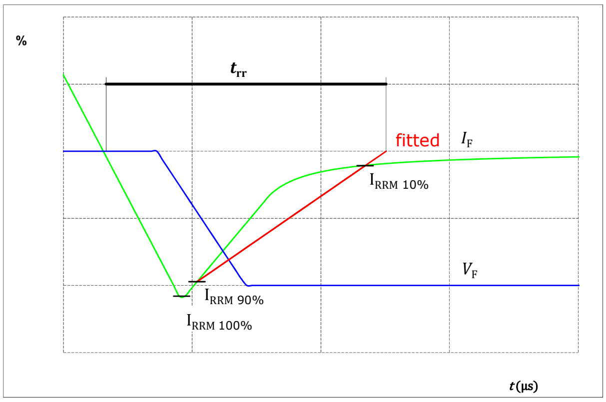
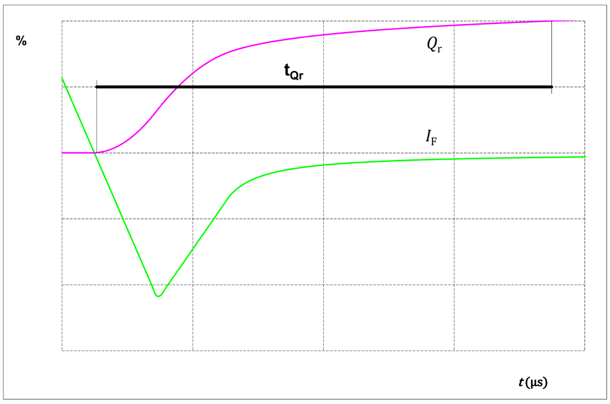


figure 55. **FWD**

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



Ordering Code

Version	Ordering Code
Without thermal paste	10-PY12B2A080N3-LP26L26Y
With thermal paste	10-PY12B2A080N3-LP26L26Y-/3/

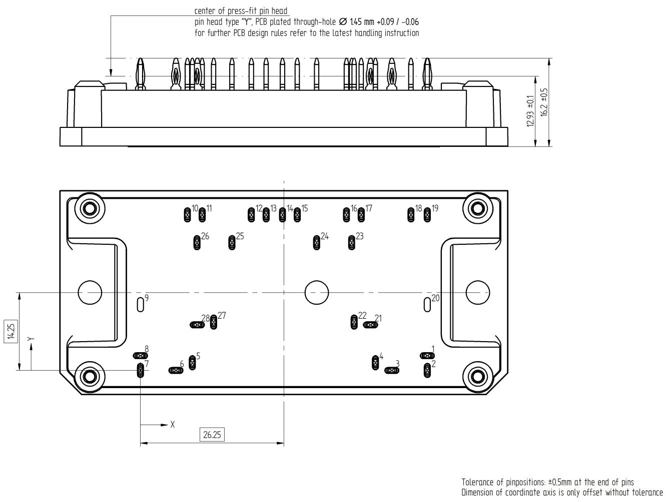
Marking

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

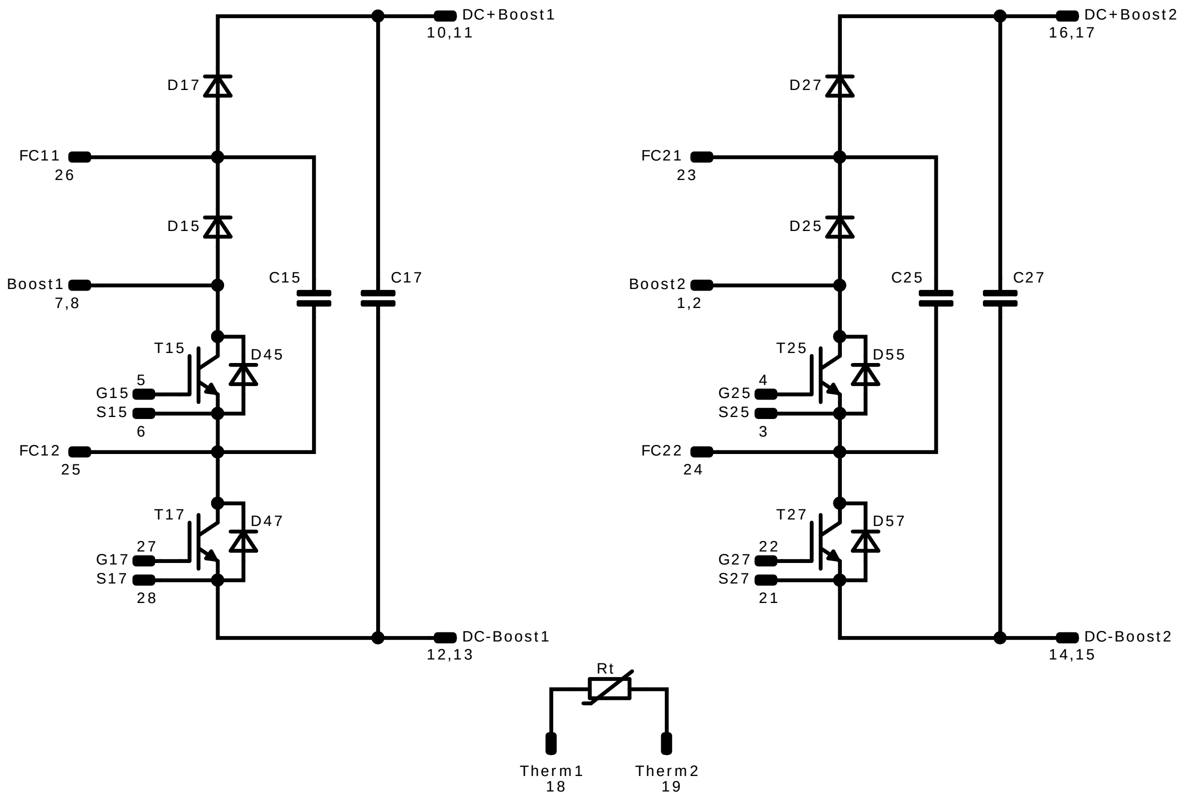
Outline

Pin table [mm]

Pin	X	Y	Function
1	52,5	2,7	Boost2
2	52,5	0	Boost2
3	46	0	S25
4	43	1,4	G25
5	9,5	1,4	G15
6	6,5	0	S15
7	0	0	Boost1
8	0	2,7	Boost1
9	not assembled		
10	8,6	28,5	DC+Boost1
11	11,3	28,5	DC+Boost1
12	20,3	28,5	DC-Boost1
13	23	28,5	DC-Boost1
14	26	28,5	DC-Boost2
15	28,7	28,5	DC-Boost2
16	37,7	28,5	DC+Boost2
17	40,4	28,5	DC+Boost2
18	49,5	28,5	Therm1
19	52,5	28,5	Therm2
20	not assembled		
21	42,1	8,35	S27
22	39,1	8,85	G27
23	38,65	23,4	FC21
24	32,25	23,4	FC22
25	16,75	23,4	FC12
26	10,35	23,4	FC11
27	13,4	8,85	G17
28	10,4	8,35	S17



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T15, T25	IGBT	1200 V	80 A	Inner Boost Switch	
T17, T27	IGBT	1200 V	80 A	Outer Boost Switch	
D15, D25	FWD	1200 V	30 A	Inner Boost Diode	
D17, D27	FWD	1200 V	30 A	Outer Boost Diode	
D45, D55	FWD	1200 V	35 A	Inner Boost Sw. Protection Diode	
D47, D57	FWD	1200 V	35 A	Outer Boost Sw. Protection Diode	
C15, C25	Capacitor	1000 V		Flying Capacitor	
C17, C27	Capacitor	1500 V		Capacitor (DC)	
Rt	Thermistor			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.

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-PY12B2A080N3-LP26L26Y-D1-14	17 Jun. 2020		