10-PY12M3A025SH-M746F08Y

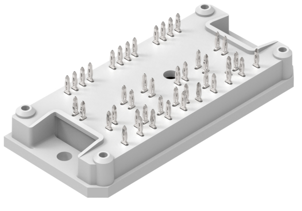
datasheet

***flow*3xMNPC 1** — **1200 V / 25 A**

Features

- 3 phase mixed voltage component topology
- Neutral point clamped inverter
- Reactive power capability
- Low inductance layout

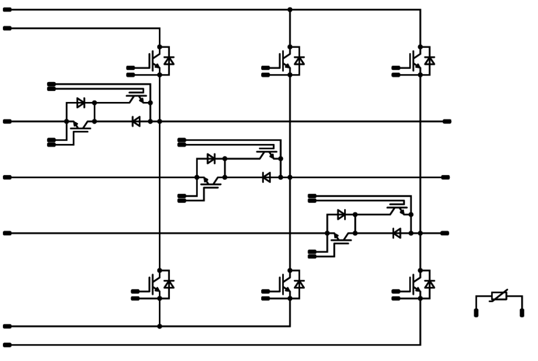
flow 1 12 mm housing



Target applications

- Solar inverter
- UPS

Schematic



Types

- 10-PY12M3A025SH-M746F08Y

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Buck Switch					
Collector-emitter voltage	V_{CES}			1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	31	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		75	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	94	W
Gate-emitter voltage	V_{GES}			±20	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 800 V	T_j = 150 °C	10	µs
Maximum junction temperature	T_{jmax}			175	°C
Buck Diode					
Peak repetitive reverse voltage	V_{RRM}			600	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	22	A
Surge (non-repetitive) forward current	I_{FSM}		T_j = 25 °C	150	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	41	W
Maximum junction temperature	T_{jmax}			150	°C
Boost Switch					
Collector-emitter voltage	V_{CES}			600	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	27	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		60	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	56	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

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Boost Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	13	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 25 °C	36	A
Surge current capability	I^2t			0	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	39	W
Maximum junction temperature	T_{jmax}			175	°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				7,89	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]	Values Min	Typ	Max	Unit
Buck Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,00085	25	5,3	5,8	6,3	V
Collector-emitter saturation voltage	V_{CEsat}		15		25	25 125	1,78	2,11 2,42	2,42[1]	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			2,4	µA
Gate-emitter leakage current	I_{GES}		20	0		25			120	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}							1430		pF
Output capacitance	C_{oes}	f = 1 Mhz	0	25		25		115		pF
Reverse transfer capacitance	C_{res}							75		pF
Gate charge	Q_g	V_{CC} = 960 V	15		25	25		115		nC
Thermal										
Thermal resistance junction to sink [2]	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,01		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$					25 125		73 74,2		ns
Rise time	t_r	R_{gon} = 16 Ω R_{goff} = 16 Ω				25 125		15 18		ns
Turn-off delay time	$t_{d(off)}$		±15	350	15	25 125		166,4 219,8		ns
Fall time	t_f					25 125		21,09 116,3		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,191 µC Q_{rFWD}=0,442 µC				25 125		0,17 0,3		mWs
Turn-off energy (per pulse)	E_{off}					25 125		0,367 0,629		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	
Buck Diode										
Static										
Forward voltage	V_F				15	25 125	1,88	2,47 1,73	2,73(1)	V
Reverse leakage current	I_R	V_r = 600 V				25			100	µA
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,71		K/W
Dynamic										
Peak recovery current	I_{RRM}	d*i*/d*t*=1415 A/µs d*i*/d*t*=1159 A/µs	±15	350	15	25 125		16,08 22,27		A
Reverse recovery time	t_{rr}					25 125		23,04 32,92		ns
Recovered charge	Q_r					25 125		0,191 0,442		µC
Reverse recovered energy	E_{rec}					25 125		0,025 0,05		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125		1860 1998		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	5,8	6,5	V
Collector-emitter saturation voltage	V_{CEsat}		15		20	25 125	1,1	1,53 1,7	1,9(1)	V
Collector-emitter cut-off current	I_{CES}		0	600		25			1,1	µA
Gate-emitter leakage current	I_{GES}		20	0		25			300	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	f = 1 Mhz	0	25		25		1100		pF
Output capacitance	C_{oes}	f = 1 Mhz	0	25		25		71		pF
Reverse transfer capacitance	C_{res}	f = 1 Mhz	0	25		25		32		pF
Gate charge	Q_g	V_{CC} = 480 V	15		20	25		120		nC
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,7		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 16 Ω R_{goff} = 16 Ω	±15	350	15	25 125		72,4 74,2		ns
Rise time	t_r	R_{gon} = 16 Ω R_{goff} = 16 Ω	±15	350	15	25 125		14 15,6		ns
Turn-off delay time	$t_{d(off)}$	R_{gon} = 16 Ω R_{goff} = 16 Ω	±15	350	15	25 125		131,2 157,2		ns
Fall time	t_f	R_{gon} = 16 Ω R_{goff} = 16 Ω	±15	350	15	25 125		33,89 68,86		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,693 µC Q_{rFWD}=1,51 µC	±15	350	15	25 125		0,313 0,387		mWs
Turn-off energy (per pulse)	E_{off}		±15	350	15	25 125		0,379 0,529		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	
Boost Diode										
Static										
Forward voltage	V_F				8	25 125 150		2,18 2,31	2,65(1) 2,68(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25 150		 0,3	0,06 0,7	mA
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						2,44		K/W
Dynamic										
Peak recovery current	I_{RRM}	di/dt=1124 A/µs di/dt=1109 A/µs	±15	350	15	25 125		21,09 24,46		A
Reverse recovery time	t_{rr}					25 125		29,92 34,71		ns
Recovered charge	Q_r					25 125		0,693 1,51		µC
Reverse recovered energy	E_{rec}					25 125		0,137 0,382		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125		1972 2214		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	
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

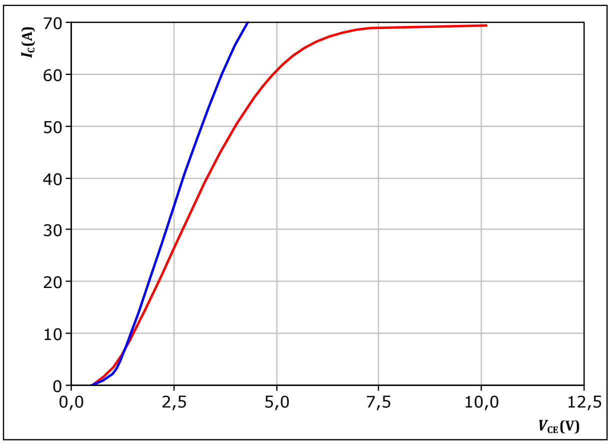
(2) Only valid with pre-applied Vincotech thermal interface material.

Buck Switch Characteristics

figure 1. IGBT

Typical output characteristics

I_C = f(V_{CE})

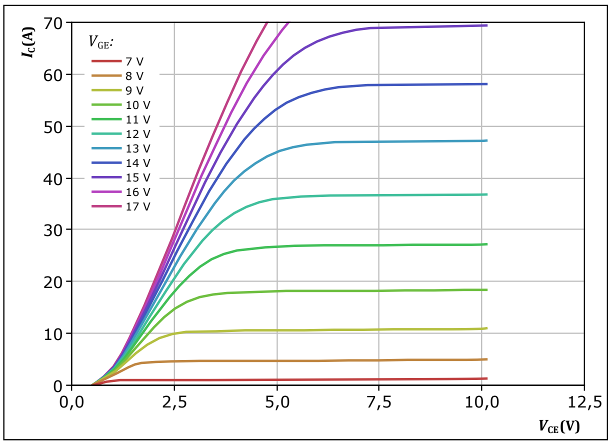


t_p =	250	μs	T_j:	25 °C
V_{GE} =	15	V		125 °C

figure 2. IGBT

Typical output characteristics

I_C = f(V_{CE})



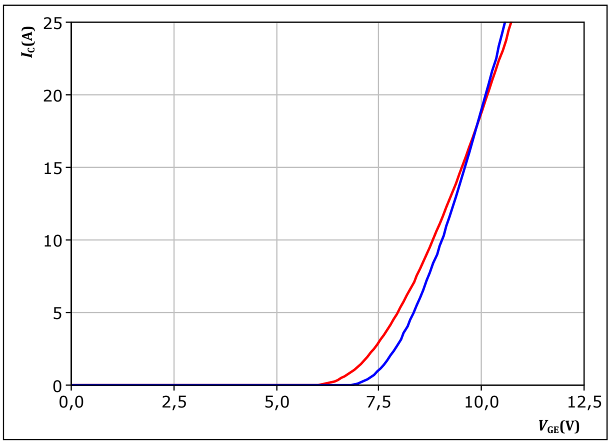
t_p =	250	μs
T_j =	125	°C

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

figure 3. IGBT

Typical transfer characteristics

I_C = f(V_{GE})

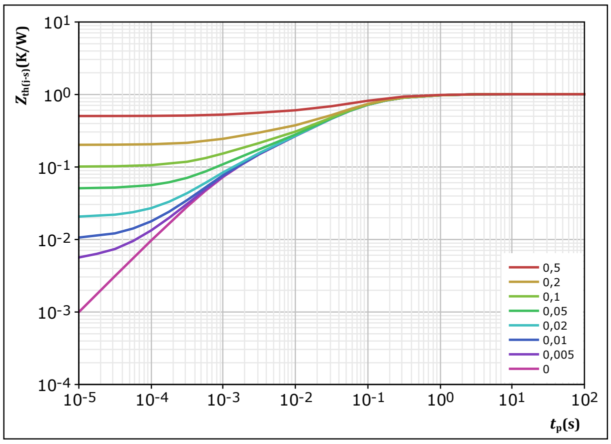


t_p =	250	μs	T_j:	25 °C
V_{CE} =	10	V		125 °C

figure 4. IGBT

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	1,009	K/W

IGBT thermal model values

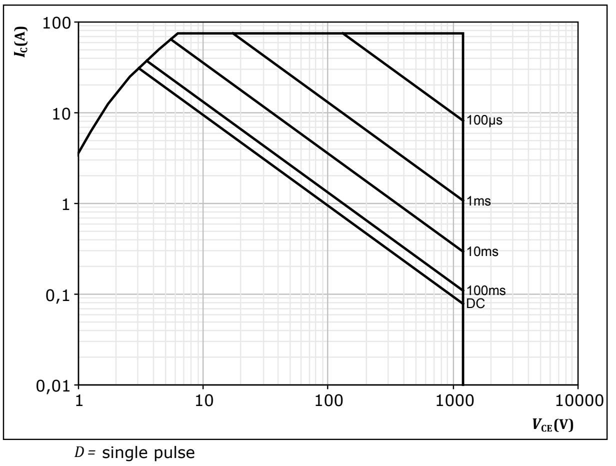
R (K/W)	τ (s)
8,44E-02	1,03E+00
2,46E-01	1,79E-01
4,48E-01	5,38E-02
1,38E-01	1,04E-02
5,48E-02	1,66E-03
3,85E-02	8,73E-04

Buck Switch Characteristics

figure 5.	IGBT

Safe operating area

I_C = f(V_{CE})



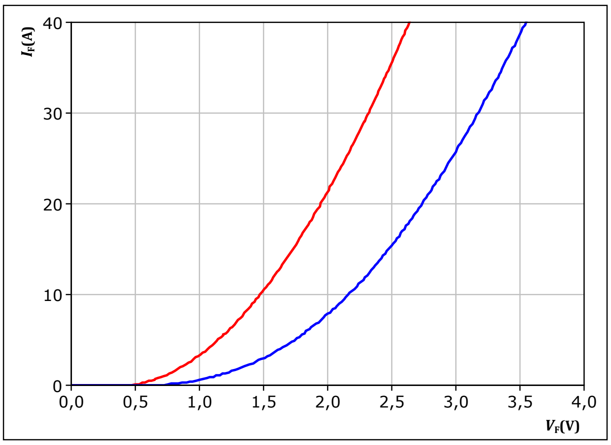
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Buck Diode Characteristics

figure 6. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



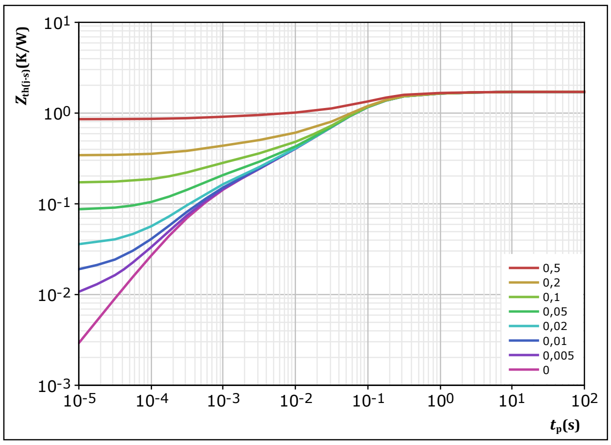
t_p = 250 µs

T_j: 25 °C, 125 °C

figure 7. **FWD**

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

$R_{th(j-s)}$ = 1,713 K/W

FWD thermal model values

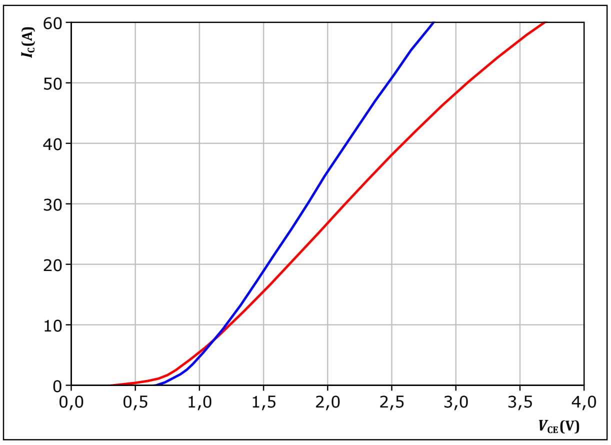
R (K/W)	τ (s)
7,49E-02	2,70E+00
1,69E-01	4,49E-01
9,61E-01	9,37E-02
2,39E-01	3,41E-02
1,24E-01	6,38E-03
7,56E-02	1,23E-03
7,06E-02	3,59E-04

Boost Switch Characteristics

figure 8. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

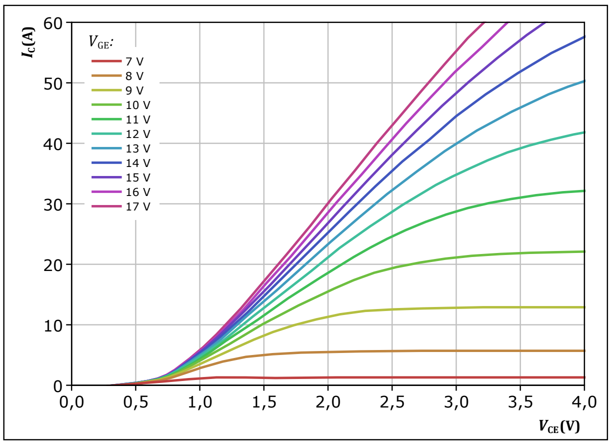


t_p =	250	μs	T_j: 25 °C
V_{GE} =	15	V	125 °C

figure 9. **IGBT**

Typical output characteristics

I_C = f(V_{CE})



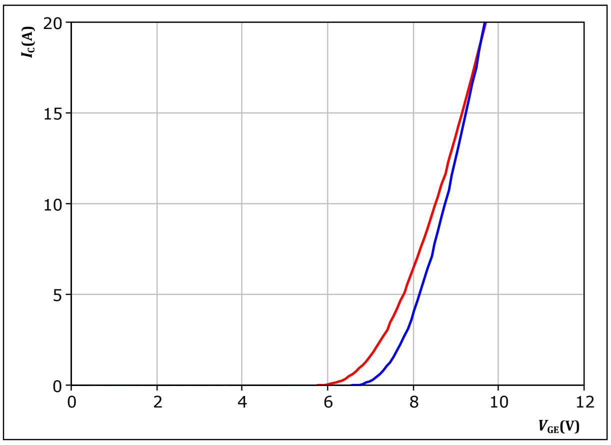
t_p =	250	μs
T_j =	125	°C

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

figure 10. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})

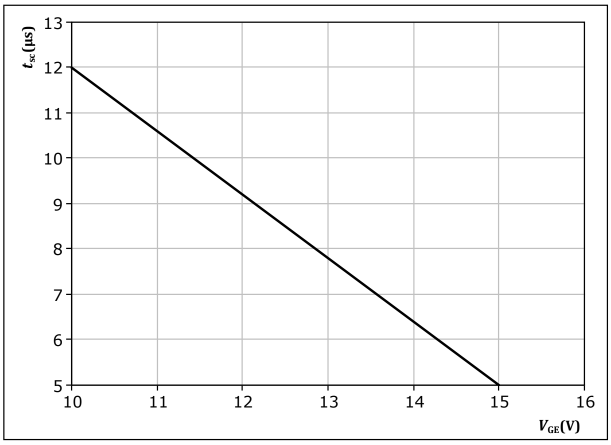


t_p =	250	μs	T_j: 25 °C
V_{CE} =	10	V	125 °C

figure 11. **IGBT**

Short circuit withstand time as a function of V_{GE}

t_{sc} = f(V_{GE})



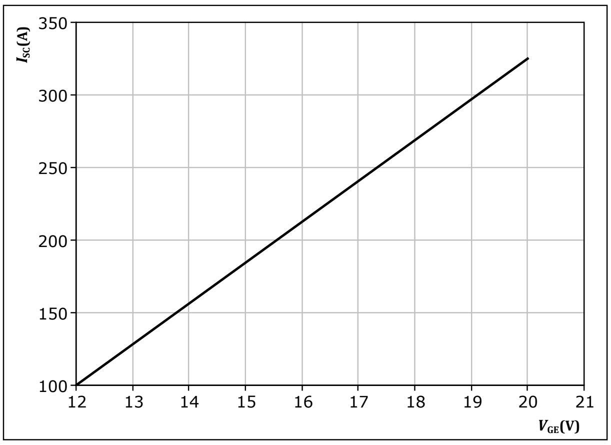
At	V_{CE} =	333	V
	$T_j \leq$	333	°C

Boost Switch Characteristics

figure 12. **IGBT**

Typical short circuit current as a function of V_{GE}

I_{SC} = f(V_{GE})

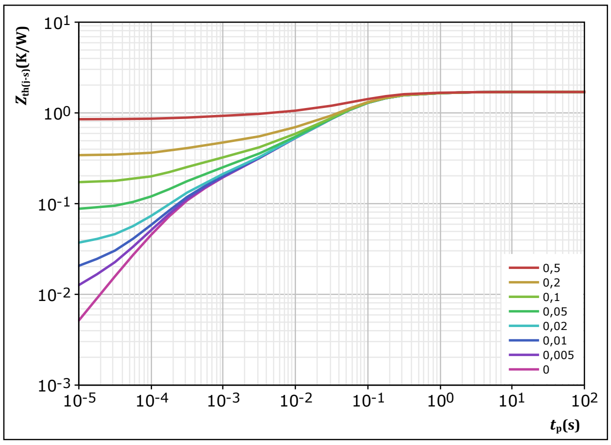


At	V_{CE} =	333	V
	$T_j \le$	333	°C

figure 13. **IGBT**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,701 K/W

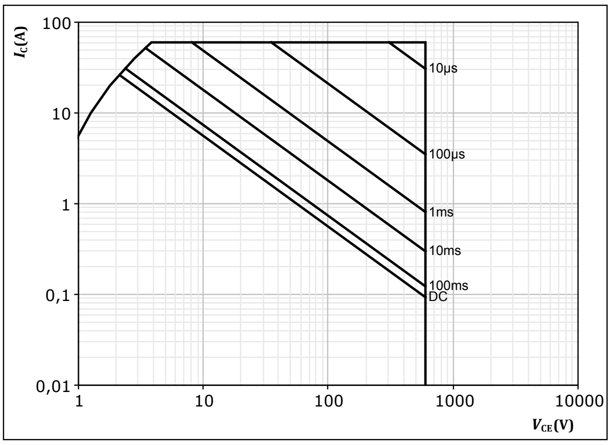
IGBT thermal model values

R (K/W)	τ (s)
9,97E-02	1,34E+00
3,46E-01	1,70E-01
8,15E-01	5,34E-02
2,54E-01	7,74E-03
7,70E-02	1,33E-03
1,09E-01	2,63E-04

figure 14. **IGBT**

Safe operating area

I_C = f(V_{CE})

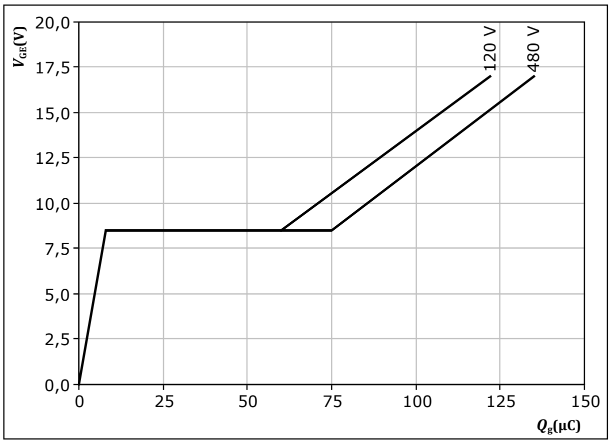


D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

figure 15. **IGBT**

Gate voltage vs gate charge

V_{GE} = f(Q_g)



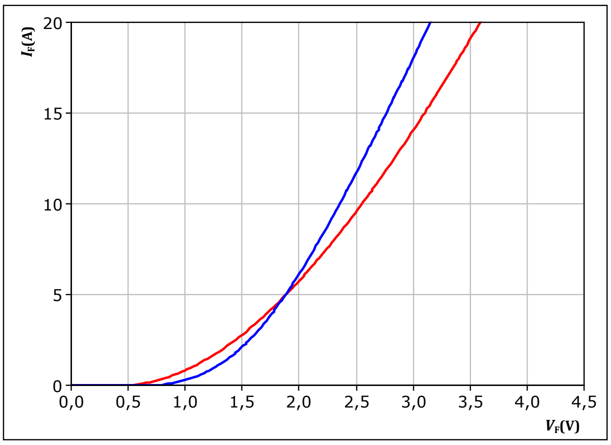
I_C =	33	A
T_j =	25	°C

Boost Diode Characteristics

figure 16. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



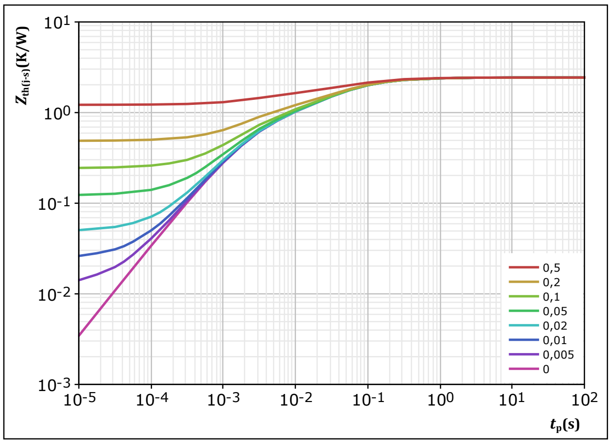
t_p = 250 μs

T_j: 25 °C, 125 °C

figure 17. **FWD**

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

$R_{th(j-s)}$ = 2,436 K/W

FWD thermal model values

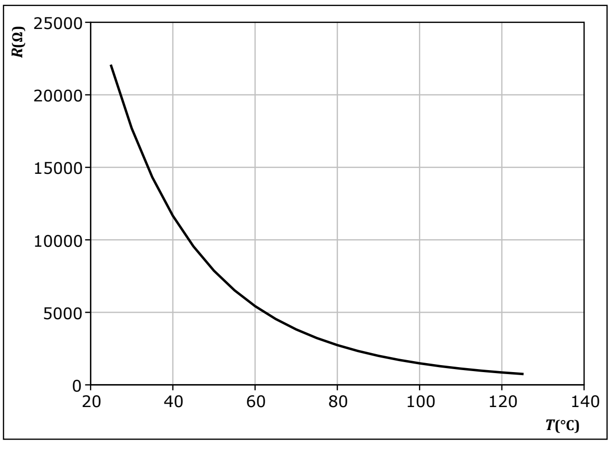
R (K/W)	τ (s)
1,03E-01	1,23E+00
3,89E-01	1,75E-01
9,47E-01	4,78E-02
5,16E-01	8,99E-03
4,81E-01	1,81E-03

Thermistor Characteristics

figure 18. **Thermistor**

Typical NTC characteristic as function of temperature

R_T = f(T)

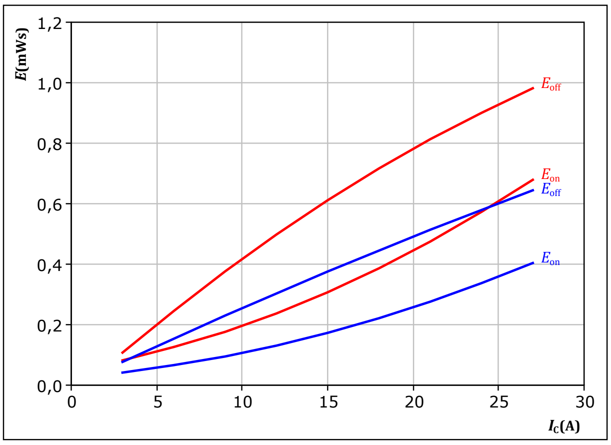


Buck Switching Characteristics

figure 19. **IGBT**

Typical switching energy losses as a function of collector current

E = f(I_C)



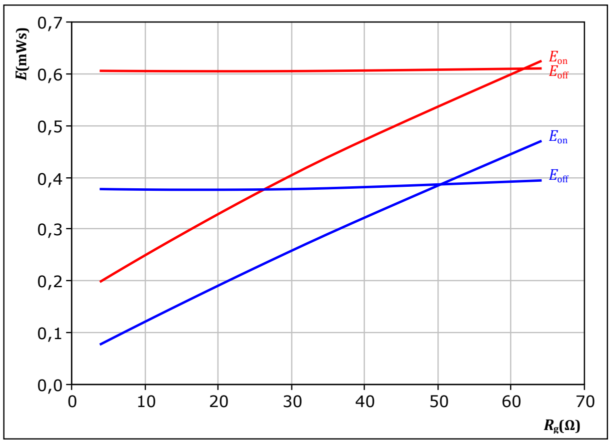
With an inductive load at

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

figure 20. **IGBT**

Typical switching energy losses as a function of gate resistor

E = f(R_g)



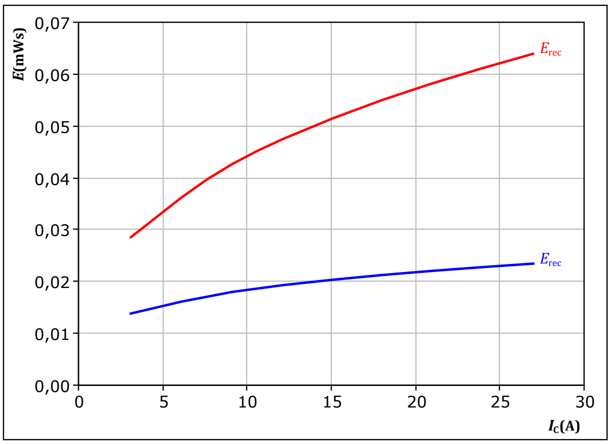
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	15	A		

figure 21. **FWD**

Typical reverse recovered energy loss as a function of collector current

E_{rec} = f(I_C)



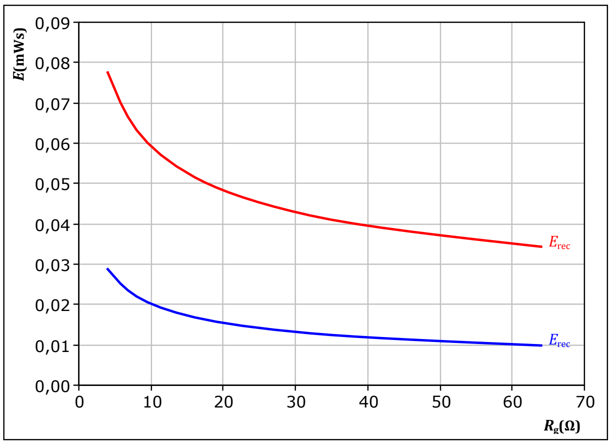
With an inductive load at

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

figure 22. **FWD**

Typical reverse recovered energy loss as a function of 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 =	15	A		

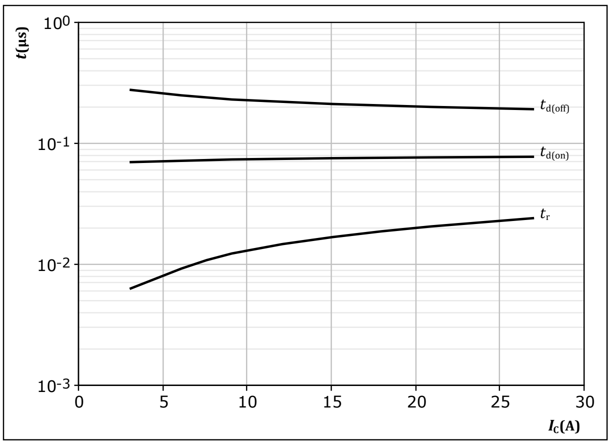
Vincotech

Buck Switching Characteristics

figure 23. **IGBT**

Typical switching times as a function of collector current

t = f(I_C)



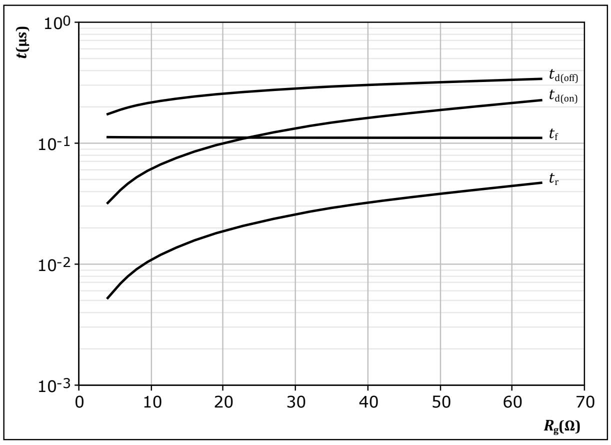
With an inductive load at

T_j =	125	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	16	Ω
R_{goff} =	16	Ω

figure 24. **IGBT**

Typical switching times as a function of gate resistor

t = f(R_g)



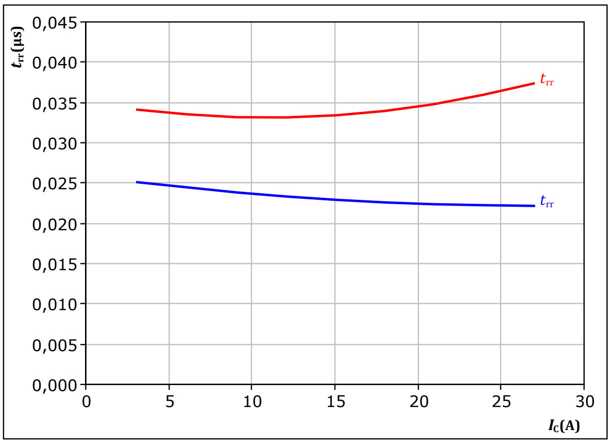
With an inductive load at

T_j =	125	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	15	A

figure 25. **FWD**

Typical reverse recovery time as a function of collector current

t_{rr} = f(I_C)



With an inductive load at

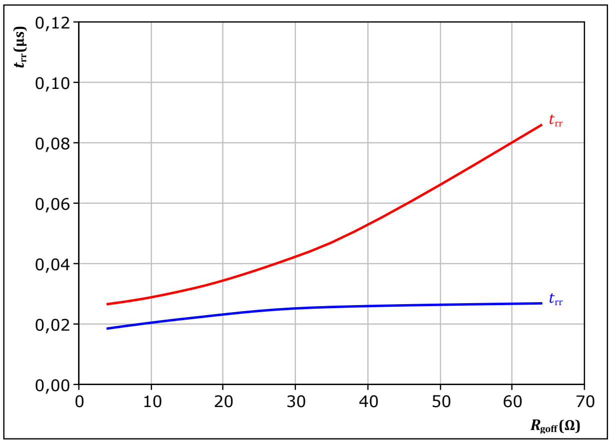
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	16	Ω

T_j: 25 °C, 125 °C

figure 26. **FWD**

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

t_{rr} = f(R_{goff})



With an inductive load at

V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	15	A

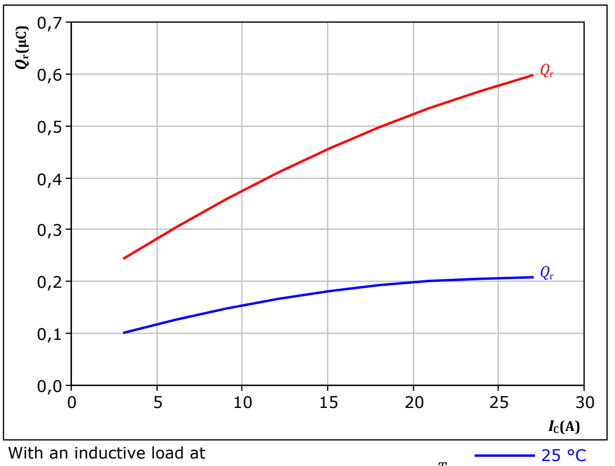
T_j: 25 °C, 125 °C

Buck Switching Characteristics

figure 27. **FWD**

Typical recovered charge as a function of collector current

$Q_r = f(I_C)$



With an inductive load at

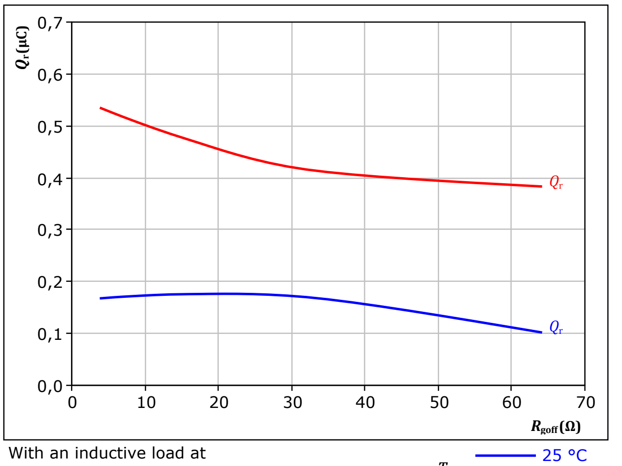
T_j: 25 °C, 125 °C

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

figure 28. **FWD**

Typical recovered charge as a function of turn off gate resistor

$Q_r = f(R_{goff})$



With an inductive load at

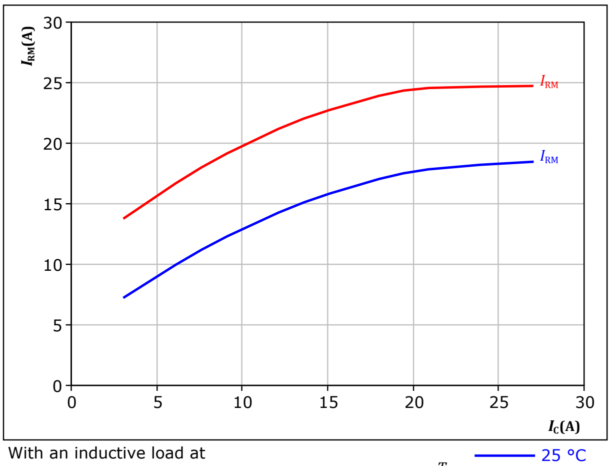
T_j: 25 °C, 125 °C

V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	15	A

figure 29. **FWD**

Typical peak reverse recovery current as a function of collector current

$I_{RM} = f(I_C)$



With an inductive load at

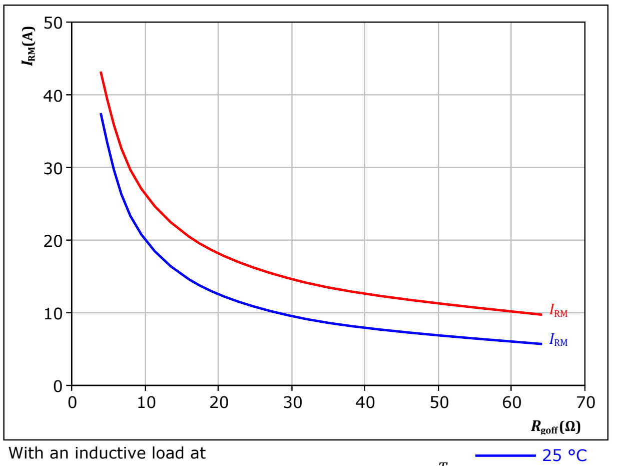
T_j: 25 °C, 125 °C

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

figure 30. **FWD**

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

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



With an inductive load at

T_j: 25 °C, 125 °C

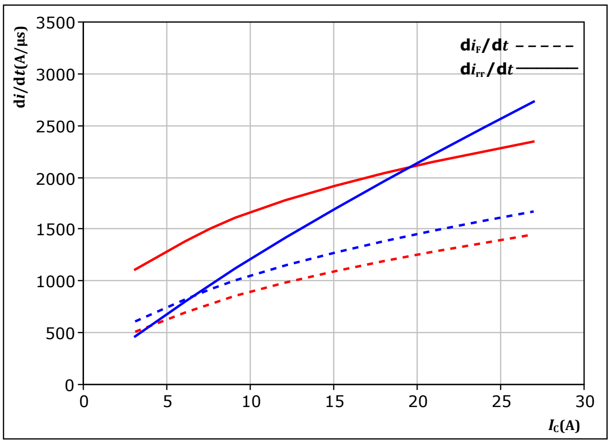
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	15	A

Buck Switching Characteristics

figure 31. **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

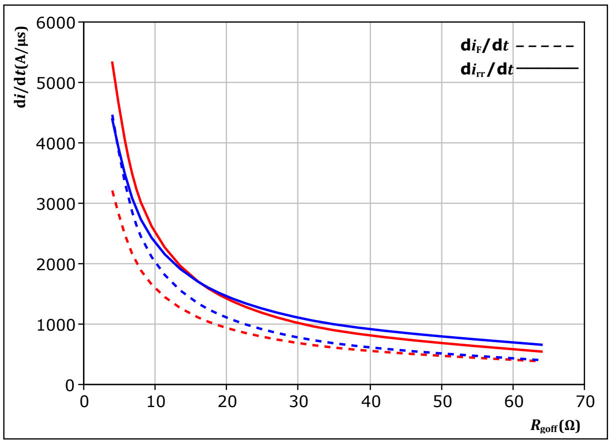
V_{CE} =	350	V	
V_{GE} =	±15	V	
R_{gon} =	16	Ω	

T_j: 25 °C, 125 °C

figure 32. **FWD**

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

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



With an inductive load at

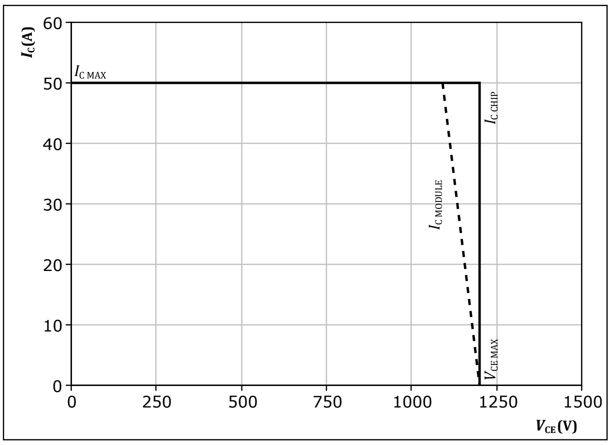
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	15	A

T_j: 25 °C, 125 °C

figure 33. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



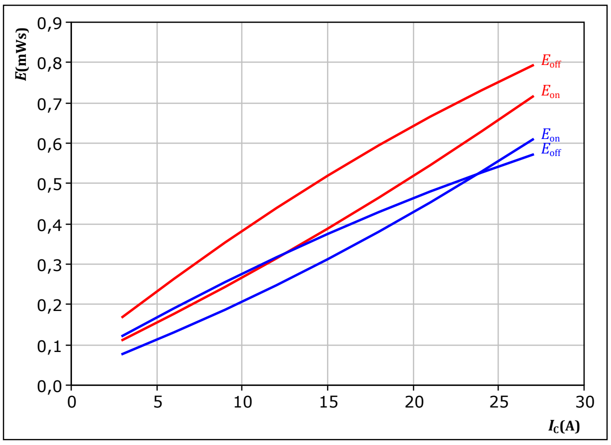
At	T_j =	125	°C
	R_{gon} =	16	Ω
	R_{goff} =	16	Ω

Boost Switching Characteristics

figure 34. **IGBT**

Typical switching energy losses as a function of collector current

E = f(I_C)



With an inductive load at

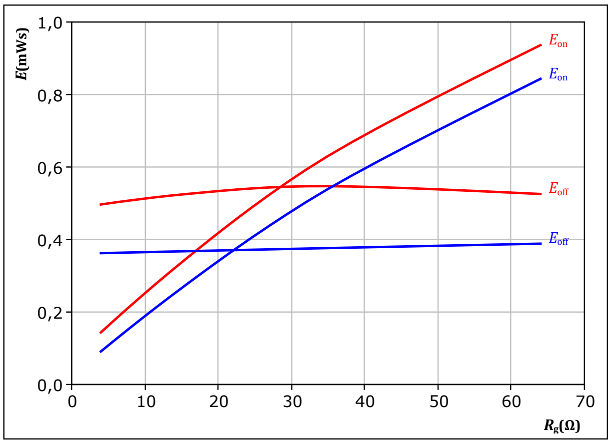
T_j: 25 °C / 125 °C

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

figure 35. **IGBT**

Typical switching energy losses as a function of gate resistor

E = f(R_g)



With an inductive load at

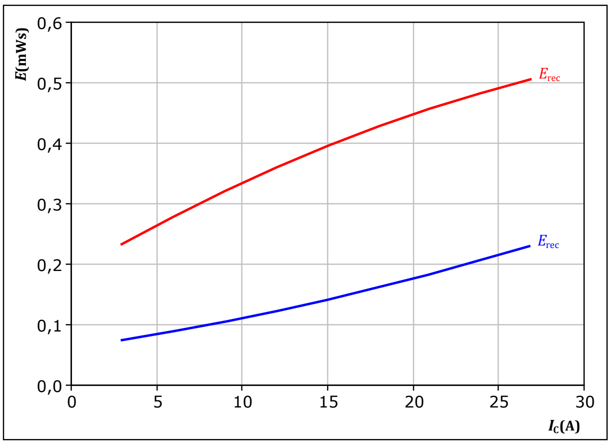
T_j: 25 °C / 125 °C

V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	15	A

figure 36. **FWD**

Typical reverse recovered energy loss as a function of collector current

E_{rec} = f(I_C)



With an inductive load at

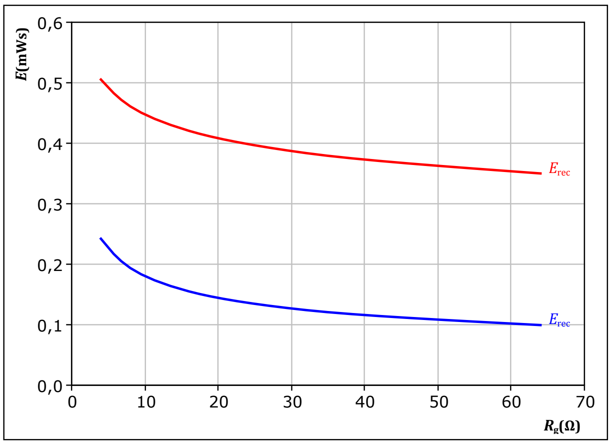
T_j: 25 °C / 125 °C

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

figure 37. **FWD**

Typical reverse recovered energy loss as a function of gate resistor

E_{rec} = f(R_g)



With an inductive load at

T_j: 25 °C / 125 °C

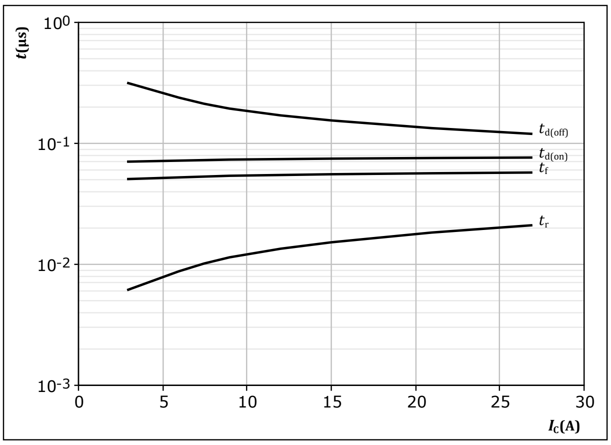
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	15	A

Boost Switching Characteristics

figure 38. **IGBT**

Typical switching times as a function of collector current

t = f(I_C)



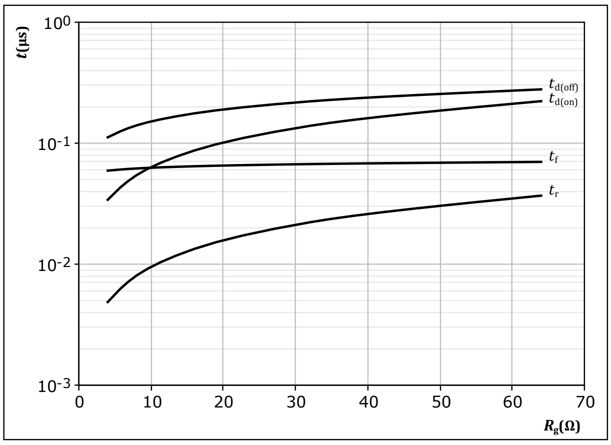
With an inductive load at

T_j =	125	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	16	Ω
R_{goff} =	16	Ω

figure 39. **IGBT**

Typical switching times as a function of gate resistor

t = f(R_g)



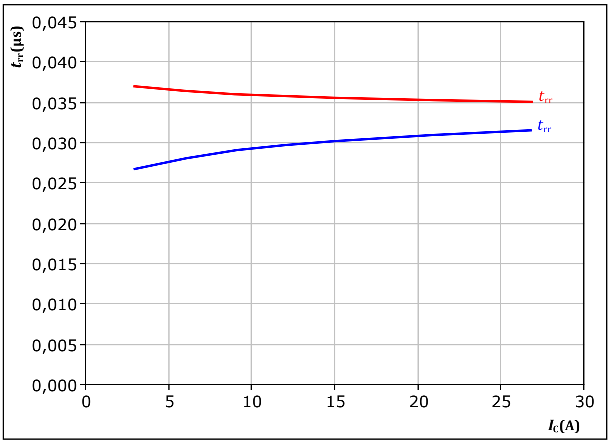
With an inductive load at

T_j =	125	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	15	A

figure 40. **FWD**

Typical reverse recovery time as a function of collector current

t_{rr} = f(I_C)



With an inductive load at

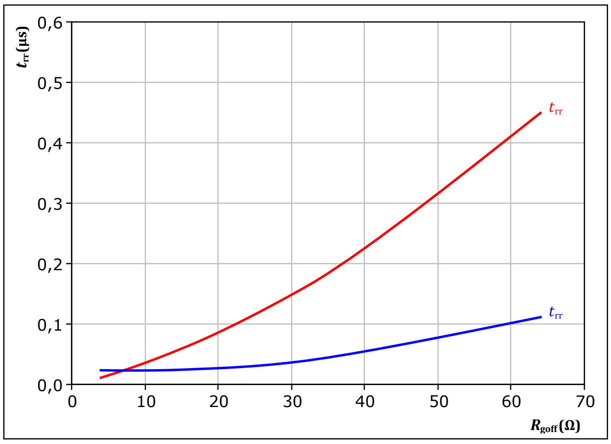
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	16	Ω

T_j: 25 °C, 125 °C

figure 41. **FWD**

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

t_{rr} = f(R_{goff})



With an inductive load at

V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	15	A

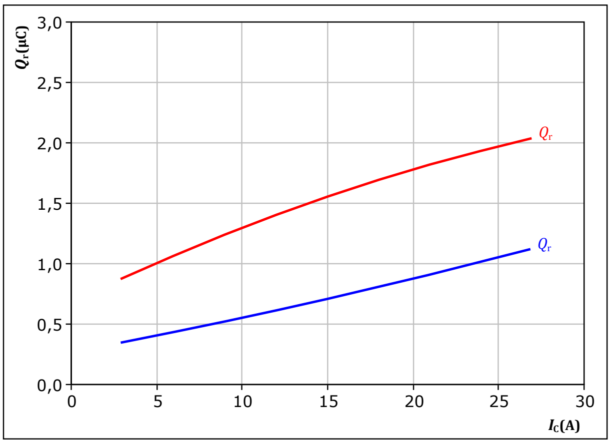
T_j: 25 °C, 125 °C

Boost Switching Characteristics

figure 42. **FWD**

Typical recovered charge as a function of collector current

Q_r = f(I_C)



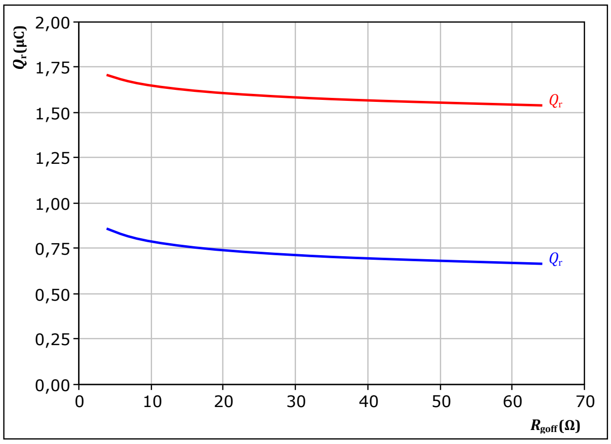
With an inductive load at

V_{CE} =	350	V	T_j: 25 °C (blue), 125 °C (red)
V_{GE} =	±15	V	
R_{gon} =	16	Ω	

figure 43. **FWD**

Typical recovered charge as a function of turn off gate resistor

Q_r = f(R_{goff})



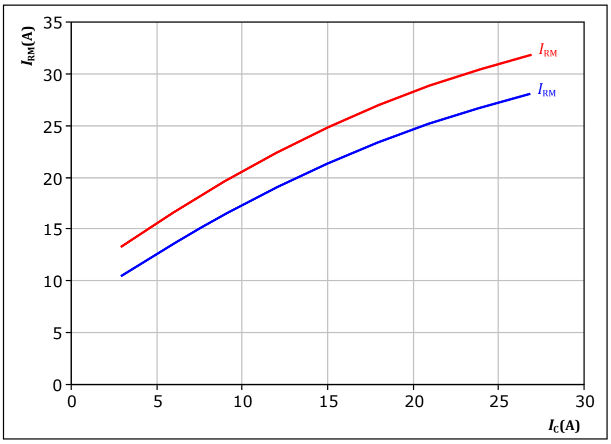
With an inductive load at

V_{CE} =	350	V	T_j: 25 °C (blue), 125 °C (red)
V_{GE} =	±15	V	
I_C =	15	A	

figure 44. **FWD**

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



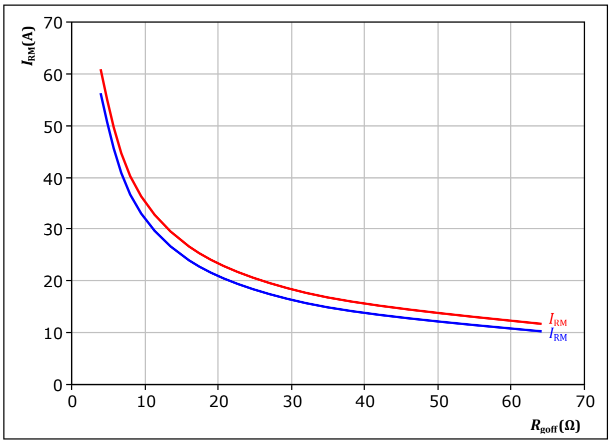
With an inductive load at

V_{CE} =	350	V	T_j: 25 °C (blue), 125 °C (red)
V_{GE} =	±15	V	
R_{gon} =	16	Ω	

figure 45. **FWD**

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

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



With an inductive load at

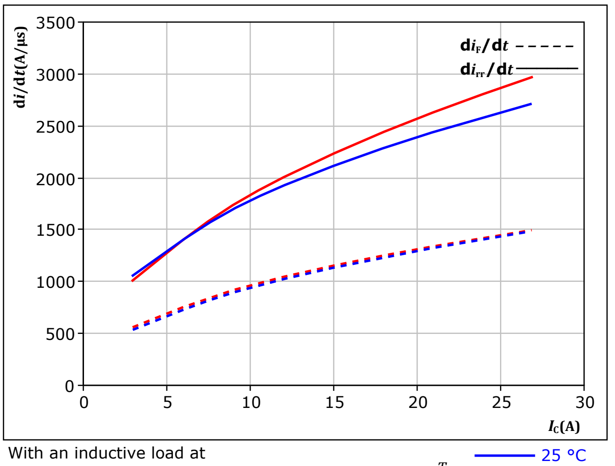
V_{CE} =	350	V	T_j: 25 °C (blue), 125 °C (red)
V_{GE} =	±15	V	
I_C =	15	A	

Boost 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)



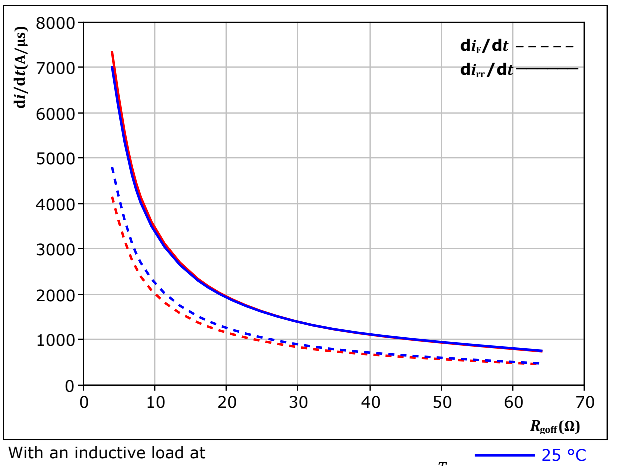
With an inductive load at

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

figure 47. **FWD**

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

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



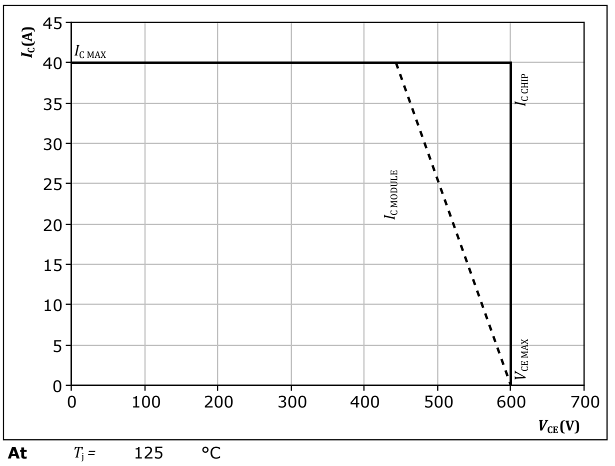
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	15	A		

figure 48. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



At	T_j =	125	°C
	R_{gon} =	16	Ω
	R_{goff} =	16	Ω

Switching Definitions

figure 49. **IGBT**

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

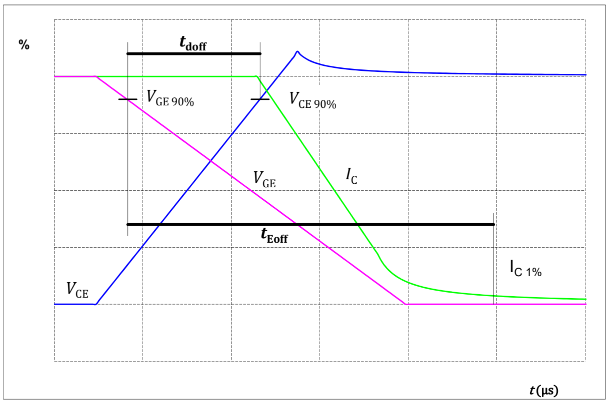


figure 50. **IGBT**

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

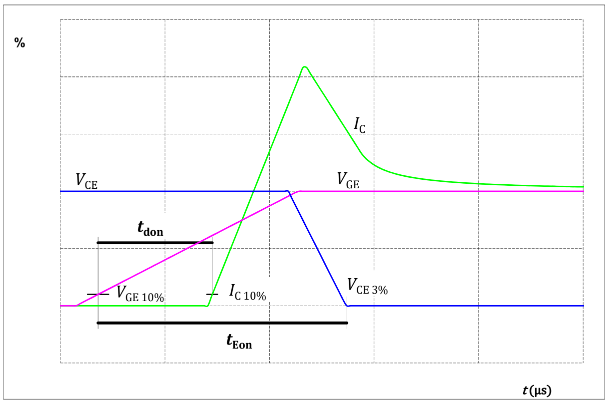


figure 51. **IGBT**

Turn-off Switching Waveforms & definition of t_f

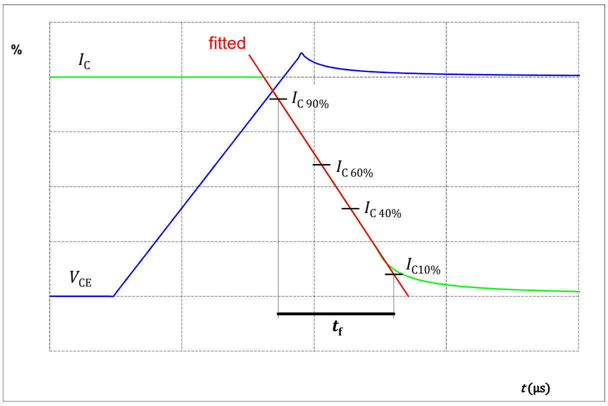
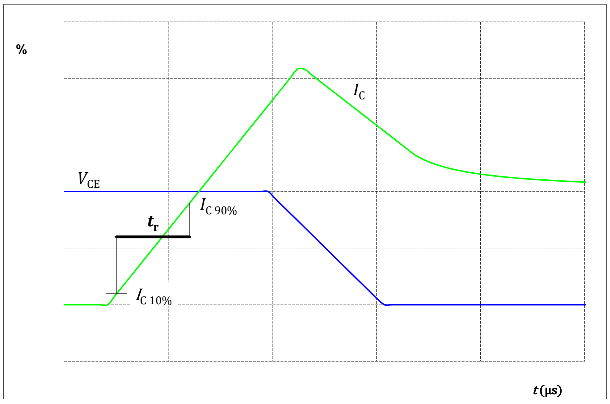


figure 52. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 53. **FWD**

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

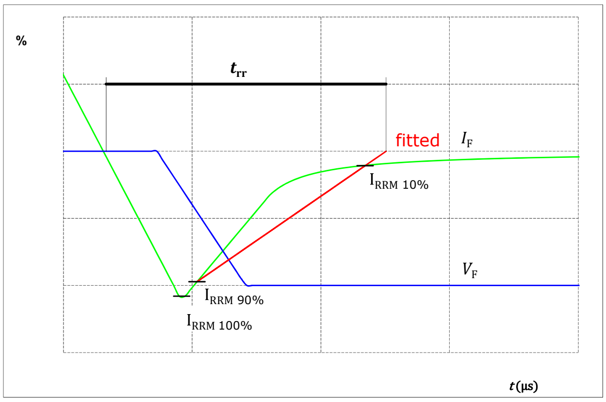
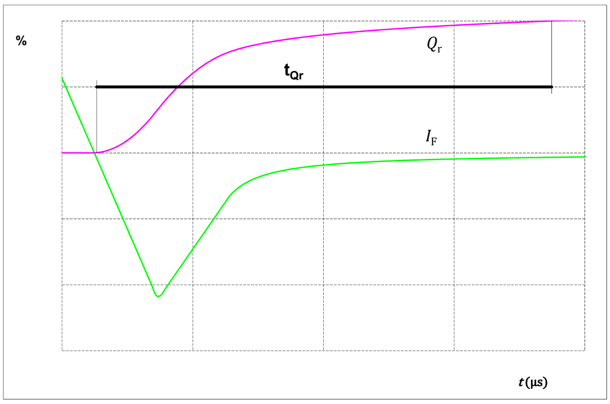


figure 54. **FWD**

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



Ordering Code

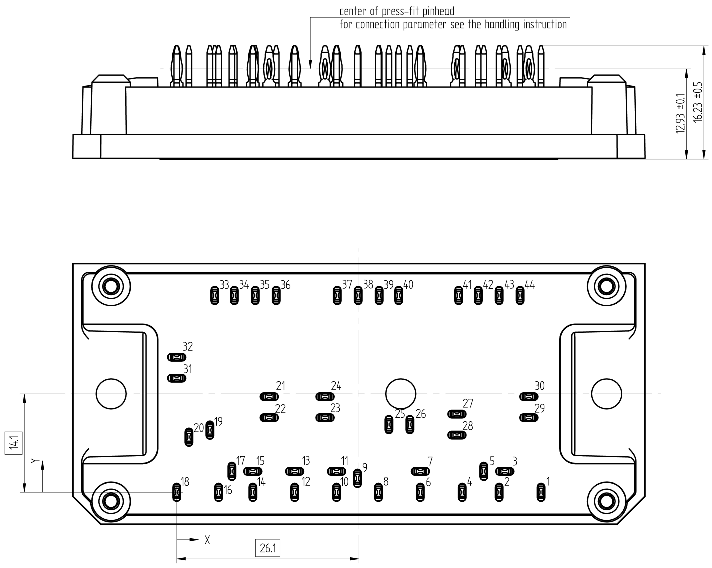
Version	Ordering Code
Without thermal paste	10-PY12M3A025SH-M746F08Y
With thermal paste (5,2 W/mK, PTM6000HV)	10-PY12M3A025SH-M746F08Y-/7/
With thermal paste (3,4 W/mK, PSX-P7)	10-PY12M3A025SH-M746F08Y-/3/

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		

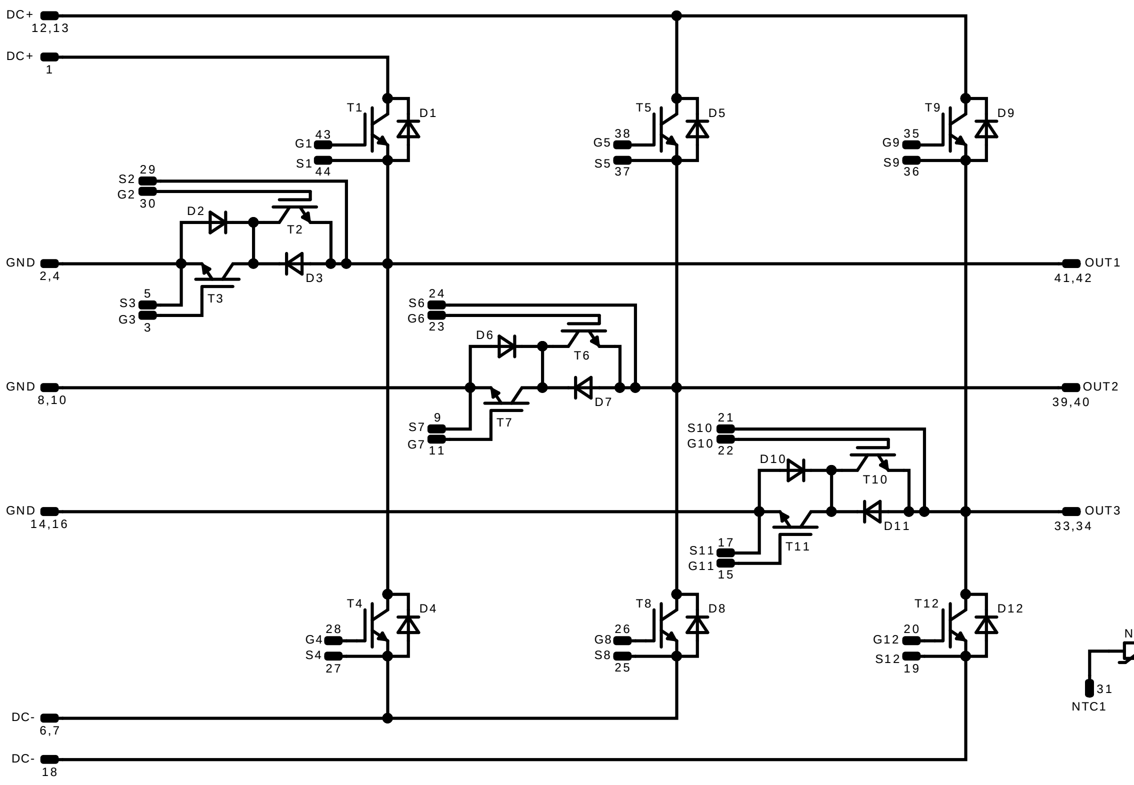
Outline

Pin	X	Y	Function
Pin table [mm]			
1	52,2	0	+DC
2	46,2	0	GND
3	47	3	G3
4	40,9	0	GND
5	44	3	S3
6	34,9	0	-DC
7	34,9	3	-DC
8	28,9	0	GND
9	25,9	2	S7
10	22,9	0	GND
11	22,9	3	G7
12	16,9	0	+DC
13	16,9	3	+DC
14	10,9	0	GND
15	10,9	3	G11
16	6	0	GND
17	7,9	3	S11
18	0	0	-DC
19	4,75	8,9	S12
20	1,75	7,9	G12
21	13,25	13,7	S10
22	13,25	10,7	G10
23	21,25	10,7	G6
24	21,25	13,7	S6
25	30,4	9,7	S8
26	33,4	9,7	G8
27	40,15	11,2	S4
28	40,15	8,2	G4
29	50,45	10,7	S2
30	50,45	13,7	G2
31	0	16,35	NTC
32	0	19,35	NTC
33	5,45	28,2	OUT3
34	8,25	28,2	OUT3
35	11,25	28,2	G9
36	14,25	28,2	S9
37	23	28,2	S5
38	26	28,2	G5
39	29	28,2	OUT2
40	31,8	28,2	OUT2
41	40,4	28,2	OUT1
42	43,2	28,2	OUT1
43	46,2	28,2	G1
44	49,2	28,2	S1



Tolerance of pinpositions: ±0,5mm at the end of pins
Dimension of coordinate axis is only offset without tolerance

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T1, T4, T5, T8, T9, T12	IGBT	1200 V	25 A	Buck Switch	
D2, D3, D6, D7, D10, D11	FWD	600 V	15 A	Buck Diode	
T3, T2, T7, T6, T11, T10	IGBT	600 V	20 A	Boost Switch	
D1, D4, D5, D8, D9, D12	FWD	1200 V	8 A	Boost Diode	
NTC	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.

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-PY12M3A025SH-M746F08Y-D6-14	12 Sep. 2021	New Datasheet format, module is unchanged Introduce Rth values with PSX-P7 TIM Separate datasheet for pressfit pin version	