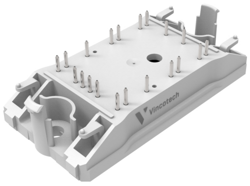
10-FS12NMA080SH08-M260F98
datasheet

***flow*MNPC 0** | **1200 V / 80 A**

Features

- Three-level MNPC topology
- High reactive power capability
- Low inductive layout
- Improved LVRT capability
- Enhanced thermal performance

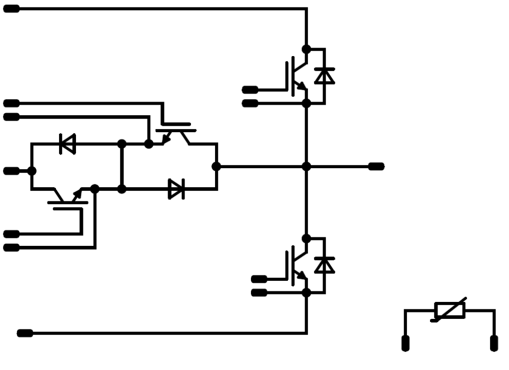
flow 0 12 mm housing



Target applications

- Industrial Drives
- Solar Inverters
- UPS

Schematic



Types

- 10-FS12NMA080SH08-M260F98

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	85	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}		240	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	223	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}			650	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	59	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		320	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	84	W
Maximum junction temperature	T_{jmax}			175	°C
Boost Switch					
Collector-emitter voltage	V_{CES}			650	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$	T_s = 80 °C	65	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	109	W
Gate-emitter voltage	V_{GES}			±30	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 360 V	T_j = 25 °C	2	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	51	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		100	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	92	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				min. 12,7	mm
Clearance				8,72	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	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,003	25	5,3	5,8	6,3	V
Collector-emitter saturation voltage	V_{CEsat}		15		80	25 125 150	1,78	1,99 2,33 2,41	2,42(1)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			10	μA
Gate-emitter leakage current	I_{GES}		20	0		25			240	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	f = 1 Mhz	0	25		25		4660		pF
Output capacitance	C_{oes}							300		pF
Reverse transfer capacitance	C_{res}							260		pF
Gate charge	Q_g	V_{CC} = 960 V	15		80	25		370		nC
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 4,4 W/mK (PTM)						0,43		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 4 Ω R_{goff} = 4 Ω	±15	350	55	25 125 150		78 78 78		ns
Rise time	t_r					25 125 150		12 15 15		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		179 235 248		ns
Fall time	t_f					25 125 150		53,79 89,18 106,61		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=2,04 μC Q_{rFWD}=3,64 μC Q_{rFWD}=4,16 μC				25 125 150		0,806 1,34 1,38		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		1,47 2,7 2,73		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				80	25 125 150		1,55 1,62 1,62	1,9(1)	V
Reverse leakage current	I_R	V_r = 650 V				25			10	µA
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 4,4 W/mK (PTM)						1,13		K/W
Dynamic										
Peak recovery current	I_{RRM}	di/dt=3491 A/µs di/dt=3563 A/µs di/dt=3610 A/µs	±15	350	55	25 125 150		81,73 84,5 86,06		A
Reverse recovery time	t_{rr}					25 125 150		41,83 108,58 124,52		ns
Recovered charge	Q_r					25 125 150		2,04 3,64 4,16		µC
Reverse recovered energy	E_{rec}					25 125 150		0,314 0,665 0,771		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		6568 4238 3040		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	$V_{GE(th)}$			5	0,0571	25	5	6	7	V
Collector-emitter saturation voltage	V_{CEsat}		15		80	25 125 150		1,64 1,69 1,75	1,9[1]	V
Collector-emitter cut-off current	I_{CES}		0	650		25			10	μA
Gate-emitter leakage current	I_{GES}		30	0		25			200	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	f = 1 Mhz	0	30		25		4810		pF
Output capacitance	C_{oes}							184		pF
Reverse transfer capacitance	C_{res}							79		pF
Gate charge	Q_g		15	400	80	25		171		nC
Thermal										
Thermal resistance junction to sink [2]	$R_{th(j-s)}$	λ_{paste} = 4,4 W/mK (PTM)						0,87		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 4 Ω R_{goff} = 4 Ω	±15	350	55	25 125 150		56 58 58		ns
Rise time	t_r					25 125 150		5 5 6		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		76 89 92		ns
Fall time	t_f					25 125 150		47,06 44,09 54,14		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=5,62 μC Q_{rFWD}=7,56 μC Q_{rFWD}=8,39 μC				25 125 150		0,263 0,368 0,42		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,758 1,22 1,33		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
Boost Diode										
Static										
Forward voltage	V_F				50	25 125 150		1,66 1,78 1,79	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} = 4,4 W/mK (PTM)						1,04		K/W
Dynamic										
Peak recovery current	I_{RRM}	d*i*/d*t*=15050 A/µs d*i*/d*t*=12587 A/µs d*i*/d*t*=12212 A/µs	±15	350	55	25 125 150		150,46 149,24 153,71		A
Reverse recovery time	t_{rr}					25 125 150		33,78 112,37 115,38		ns
Recovered charge	Q_r					25 125 150		5,62 7,56 8,39		µC
Reverse recovered energy	E_{rec}					25 125 150		1,51 2,08 2,31		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		10000 9986 9495		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	

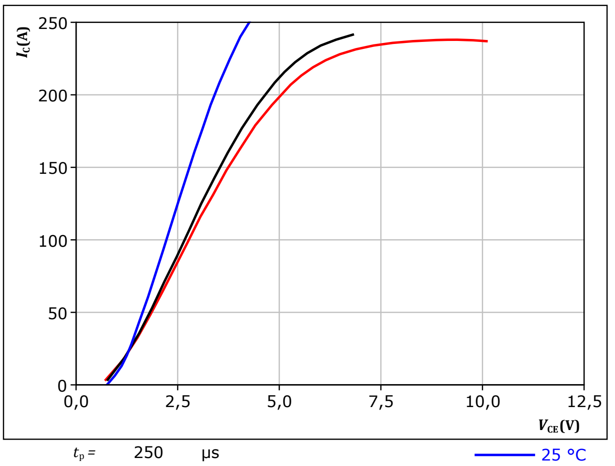
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

Buck Switch Characteristics

figure 1. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

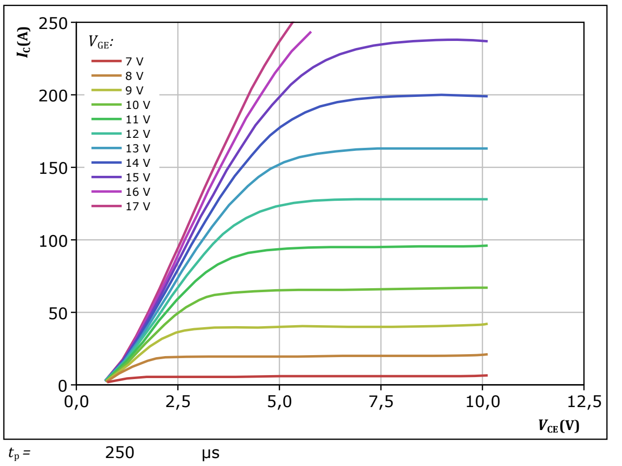


t_p = 250 µs
V_{GE} = 15 V
T_j: 25 °C, 125 °C, 150 °C

figure 2. **IGBT**

Typical output characteristics

I_C = f(V_{CE})

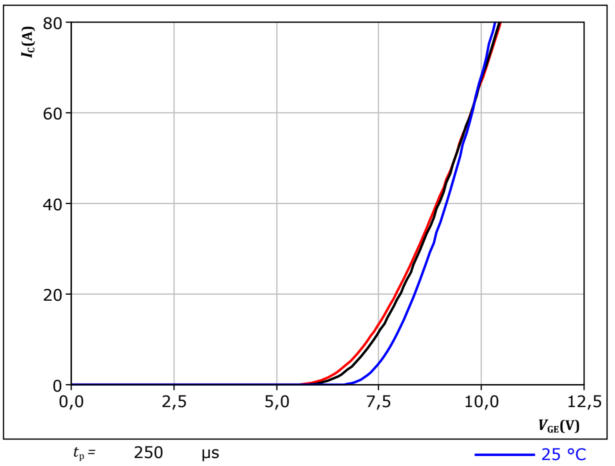


t_p = 250 µs
T_j = 150 °C
V_{GE} from 7 V to 17 V in steps of 1 V

figure 3. **IGBT**

Typical transfer characteristics

I_C = f(V_{GE})

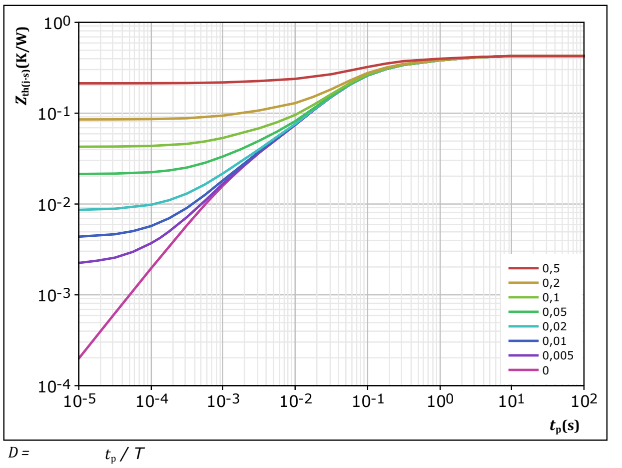


t_p = 250 µs
V_{CE} = 10 V
T_j: 25 °C, 125 °C, 150 °C

figure 4. **IGBT**

Transient thermal impedance as a function of pulse width

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



D = t_p / T
$R_{th(j-s)}$ = 0,426 K/W

IGBT thermal model values

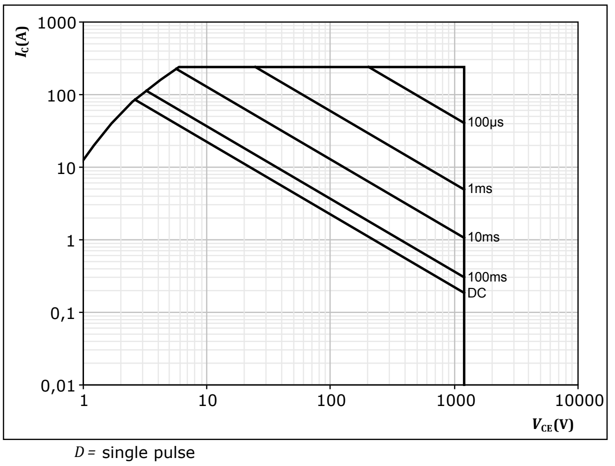
R (K/W)	τ (s)
6,34E-02	2,17E+00
6,80E-02	3,73E-01
2,18E-01	7,13E-02
5,76E-02	1,82E-02
1,95E-02	1,44E-03

Buck Switch Characteristics

figure 5.	IGBT

Safe operating area

I_C = f(V_{CE})



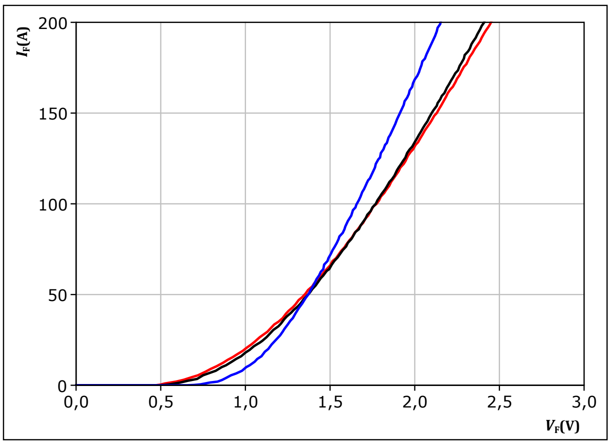
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Buck Diode Characteristics

figure 6. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



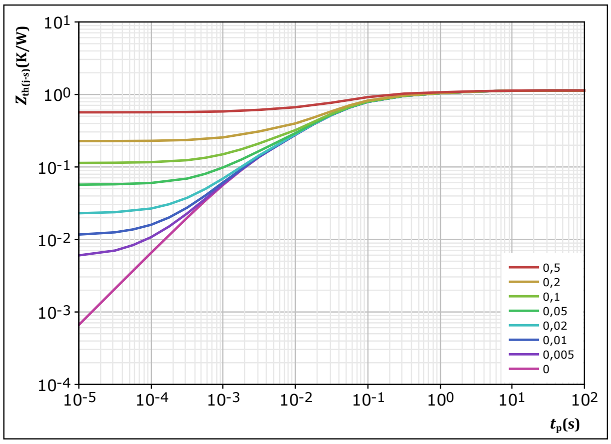
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 7. **FWD**

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

$R_{th(j-s)}$ = 1,134 K/W

FWD thermal model values

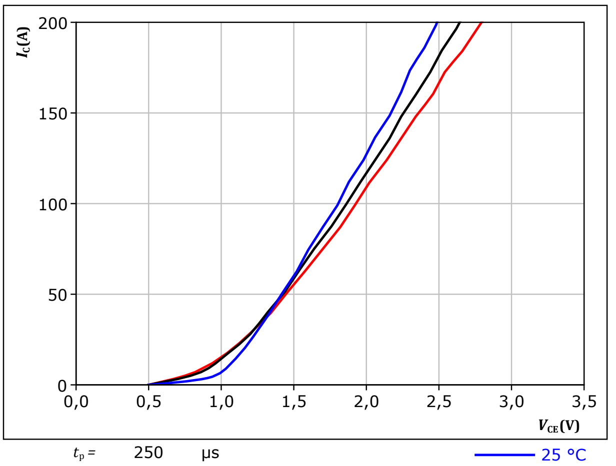
R (K/W)	τ (s)
8,81E-02	3,39E+00
1,55E-01	5,93E-01
4,48E-01	7,76E-02
3,52E-01	2,14E-02
9,01E-02	2,05E-03

Boost Switch Characteristics

figure 8. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$

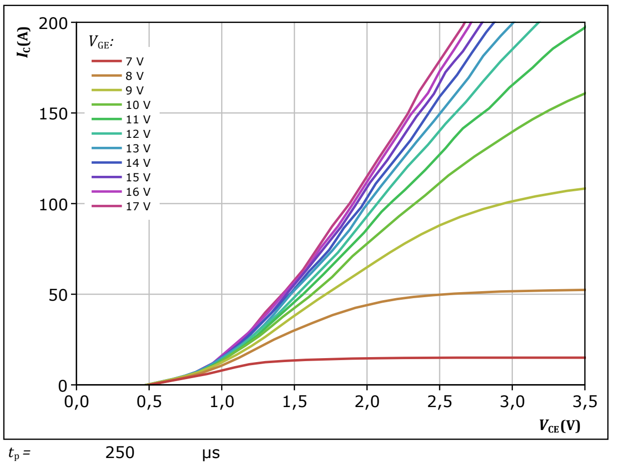


t_p =	250	µs		25 °C
V_{GE} =	15	V	T_j:	125 °C
				150 °C

figure 9. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$



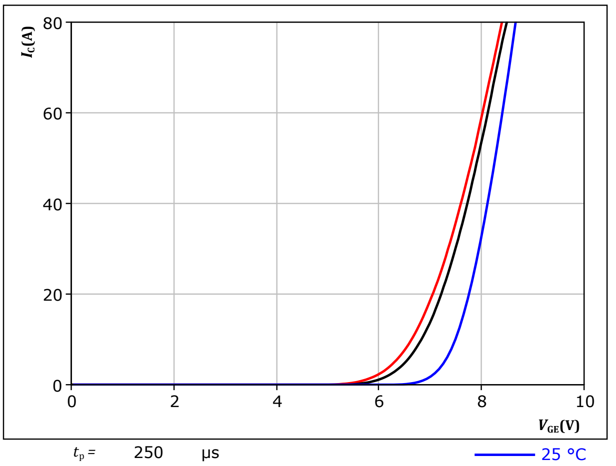
t_p =	250	µs
T_j =	150	°C

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

figure 10. **IGBT**

Typical transfer characteristics

$I_C = f(V_{GE})$

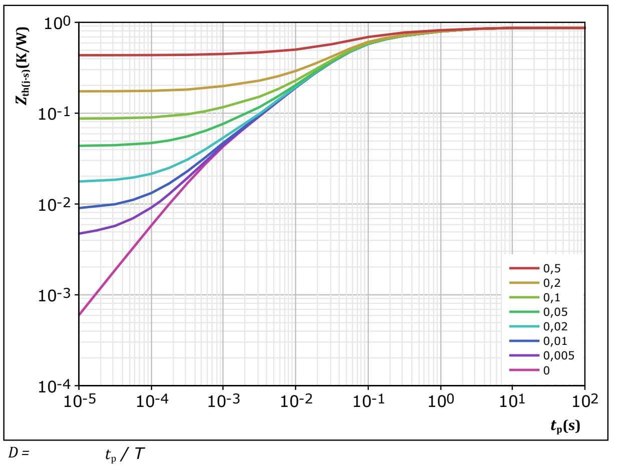


t_p =	250	µs		25 °C
V_{CE} =	10	V	T_j:	125 °C
				150 °C

figure 11. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,869	K/W

IGBT thermal model values

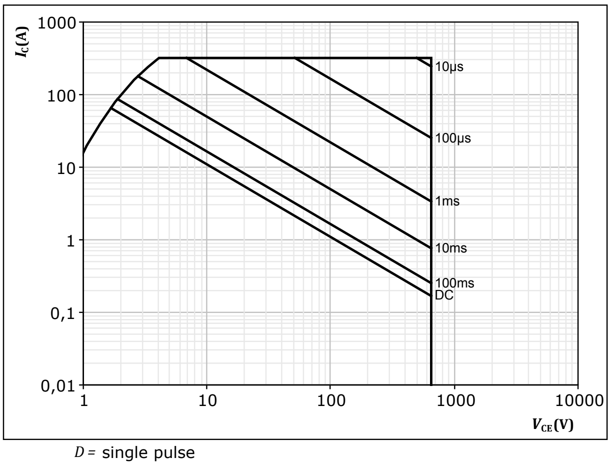
R (K/W)	τ (s)
1,24E-01	1,83E+00
1,61E-01	2,81E-01
4,39E-01	5,07E-02
1,13E-01	9,54E-03
3,33E-02	8,57E-04

Boost Switch Characteristics

figure 12. **IGBT**

Safe operating area

I_C = f(V_{CE})



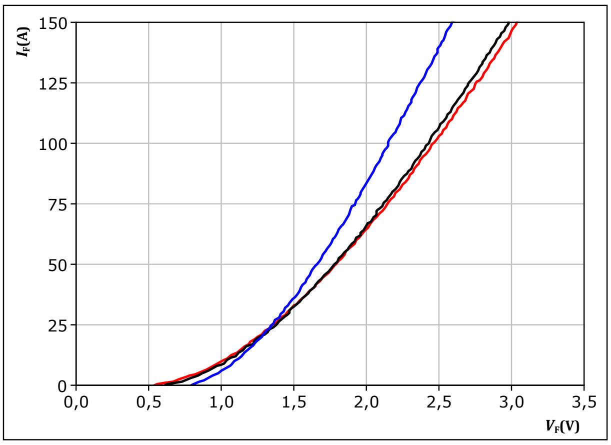
D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

Boost Diode Characteristics

figure 13. **FWD**

Typical forward characteristics

I_F = f(V_F)



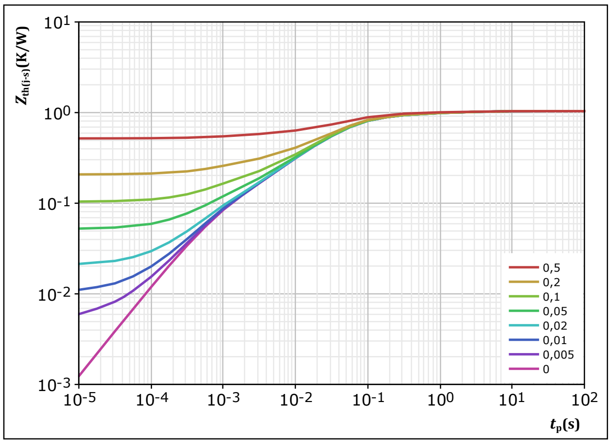
t_p = 250 µs

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

$R_{th(j-s)}$ = 1,037 K/W

FWD thermal model values

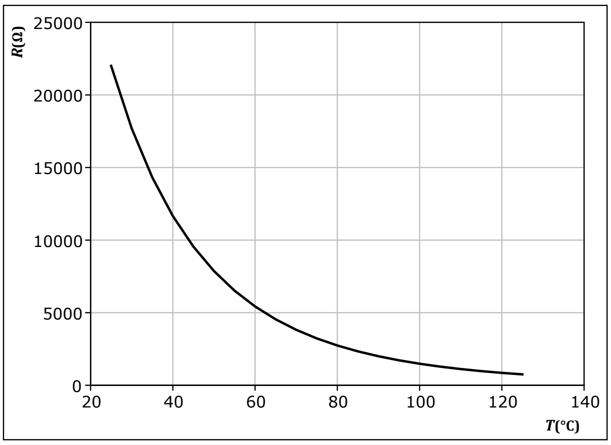
R (K/W)	τ (s)
6,88E-02	2,36E+00
1,35E-01	2,56E-01
5,81E-01	4,67E-02
1,79E-01	8,60E-03
7,33E-02	8,11E-04

Thermistor Characteristics

figure 15.	Thermistor

Typical NTC characteristic as function of temperature

$R_T = f(T)$

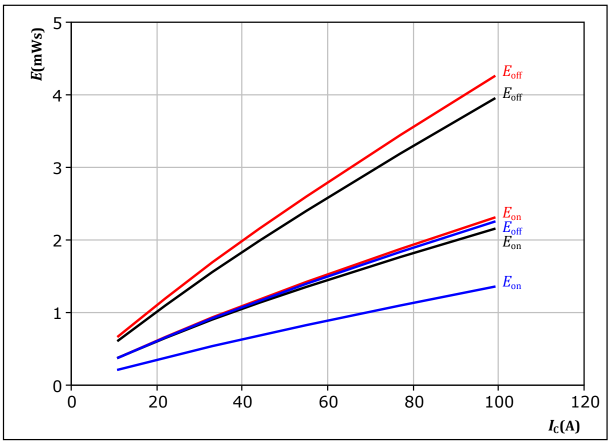


Buck Switching Characteristics

figure 16. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



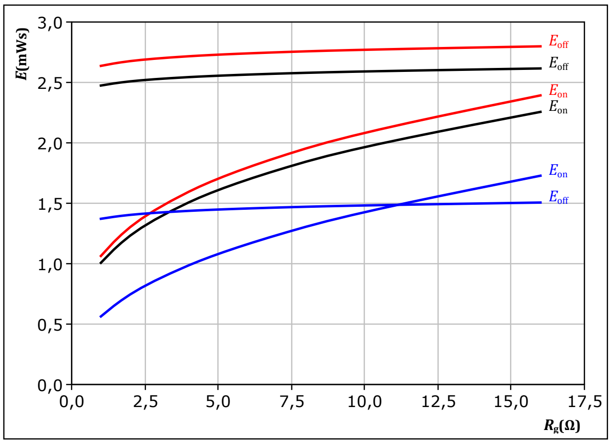
With an inductive load at

V_{CE} =	350	V	T_j:		25 °C
V_{GE} =	±15	V			125 °C
R_{gon} =	4	Ω			150 °C
R_{goff} =	4	Ω			

figure 17. **IGBT**

Typical switching energy losses as a function of gate resistor

$E = f(R_g)$



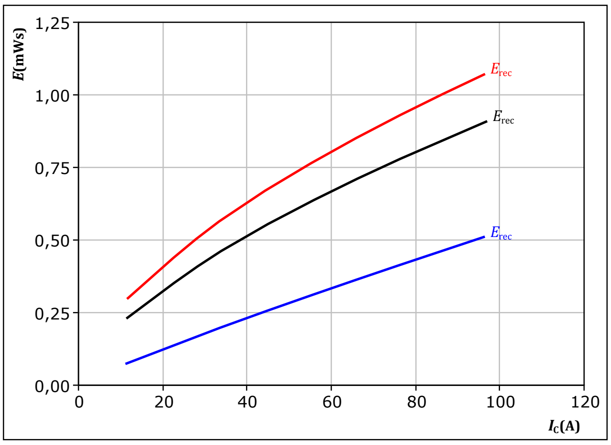
With an inductive load at

V_{CE} =	350	V	T_j:		25 °C
V_{GE} =	±15	V			125 °C
I_C =	55	A			150 °C

figure 18. **FWD**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



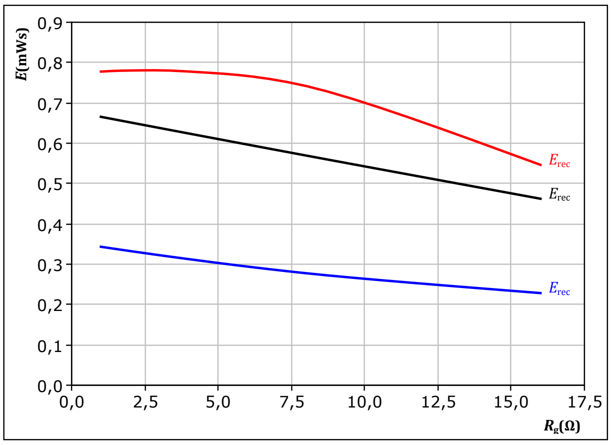
With an inductive load at

V_{CE} =	350	V	T_j:		25 °C
V_{GE} =	±15	V			125 °C
R_{gon} =	4	Ω			150 °C

figure 19. **FWD**

Typical reverse recovered energy loss as a function of gate resistor

$E_{rec} = f(R_g)$



With an inductive load at

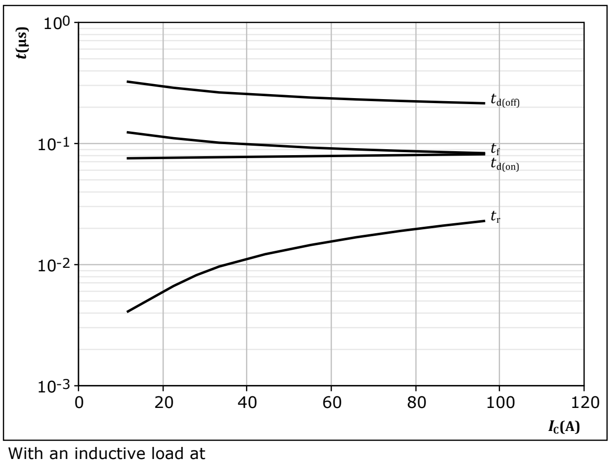
V_{CE} =	350	V	T_j:		25 °C
V_{GE} =	±15	V			125 °C
I_C =	55	A			150 °C

Buck Switching Characteristics

figure 20. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



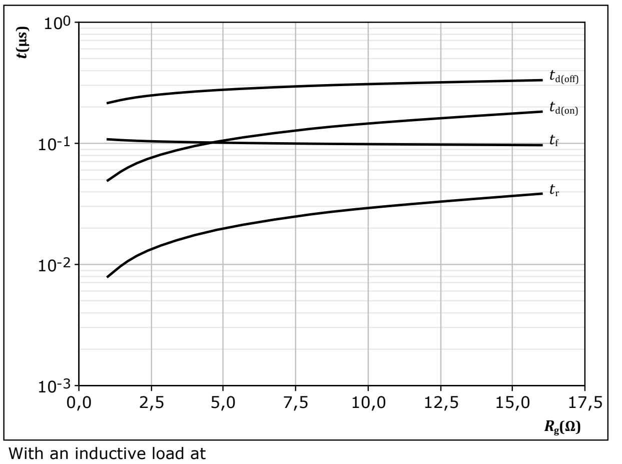
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 21. **IGBT**

Typical switching times as a function of gate resistor

$t = f(R_g)$



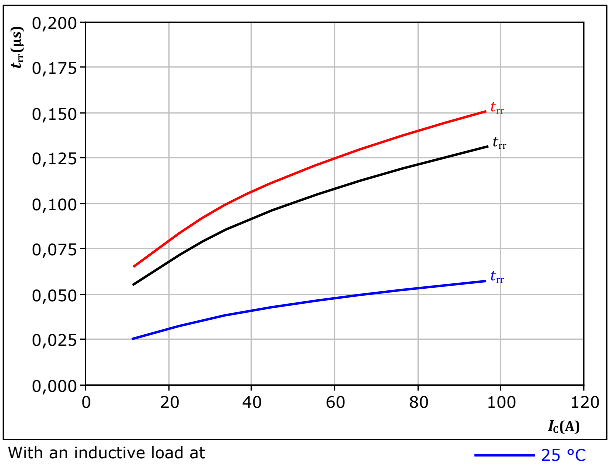
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	55	A

figure 22. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

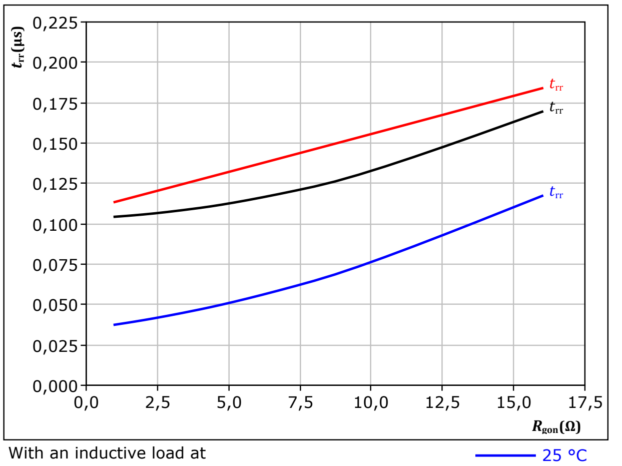
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 23. **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 =	55	A

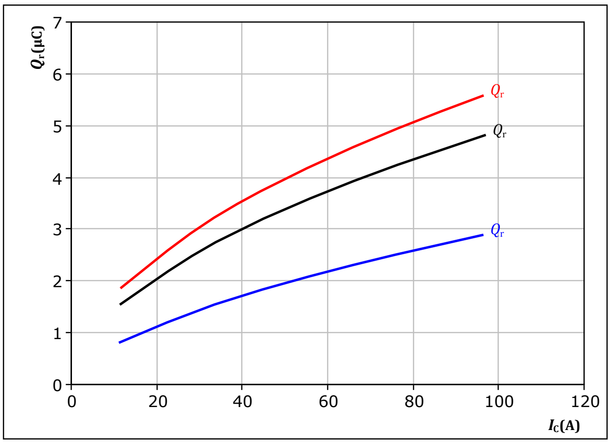
T_j: 25 °C, 125 °C, 150 °C

Buck Switching Characteristics

figure 24. **FWD**

Typical recovered charge as a function of collector current

Q_r = f(I_C)



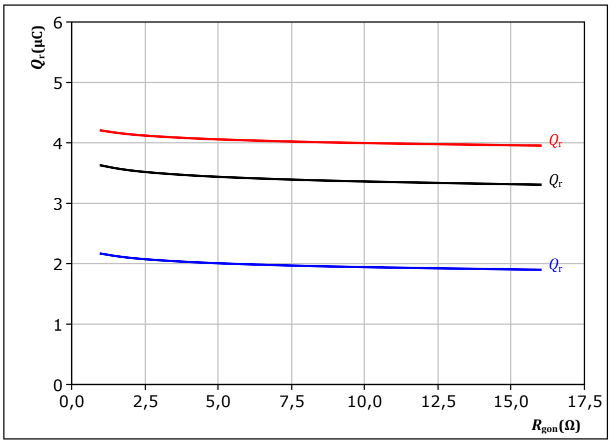
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 25. **FWD**

Typical recovered charge as a function of turn on gate resistor

Q_r = f(R_{gon})



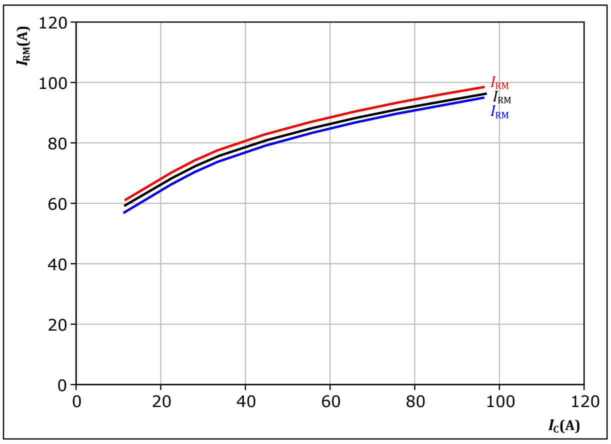
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	55	A		150 °C

figure 26. **FWD**

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



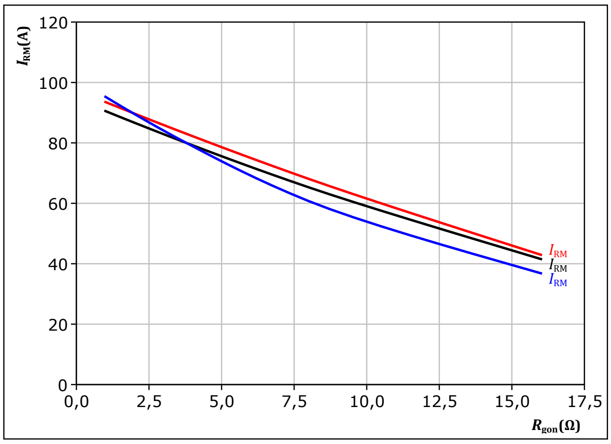
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 27. **FWD**

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

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



With an inductive load at

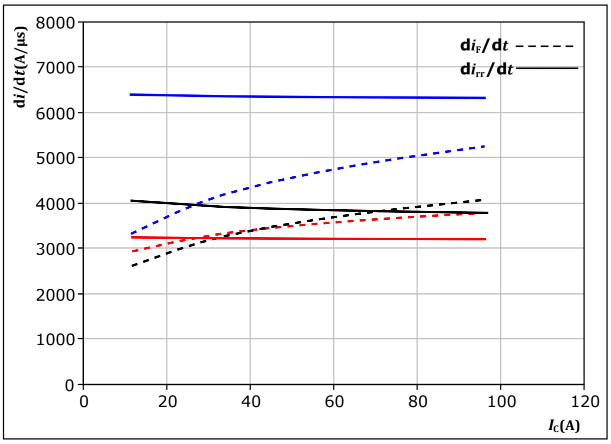
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	55	A		150 °C

Buck Switching Characteristics

figure 28. **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)



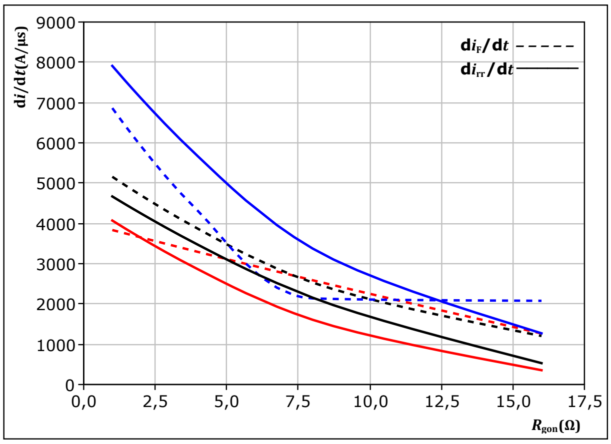
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 29. **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})



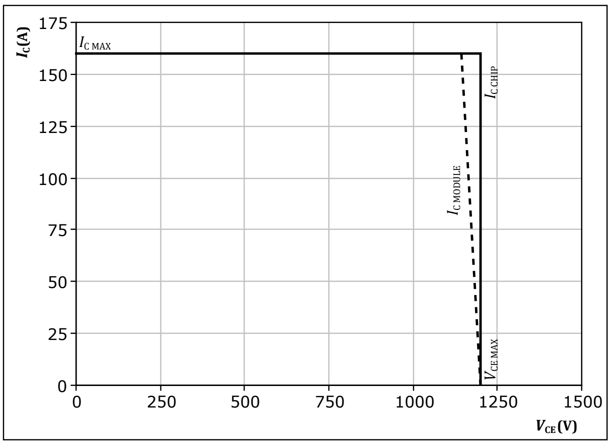
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	55	A		150 °C

figure 30. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



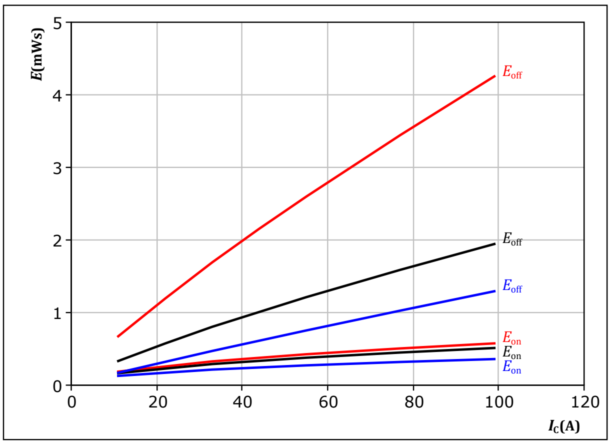
At	T_j =	150	°C
	R_{gon} =	4	Ω
	R_{goff} =	4	Ω

Boost Switching Characteristics

figure 31. **IGBT**

Typical switching energy losses as a function of collector current

E = f(I_C)



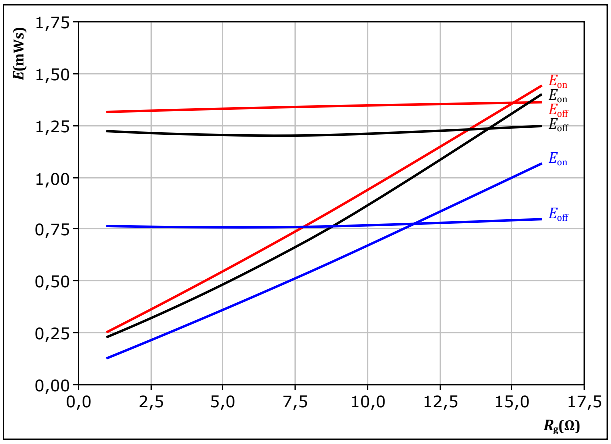
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C
R_{goff} =	4	Ω		

figure 32. **IGBT**

Typical switching energy losses as a function of gate resistor

E = f(R_g)



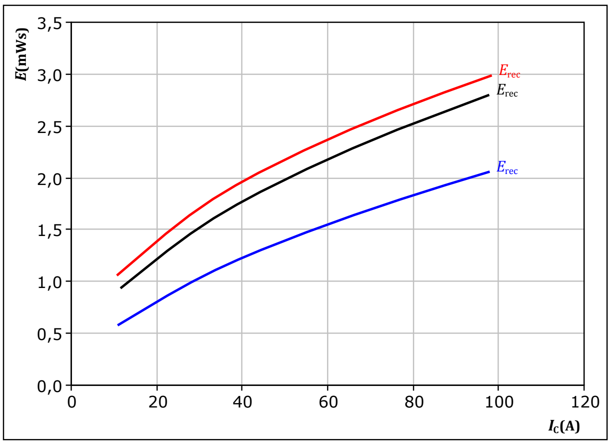
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	55	A		150 °C

figure 33. **FWD**

Typical reverse recovered energy loss as a function of collector current

E_{rec} = f(I_C)



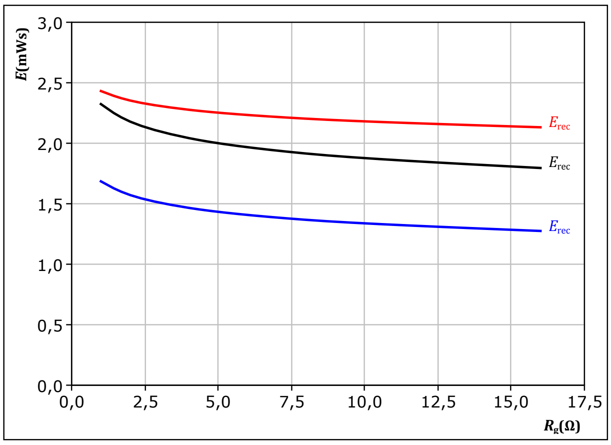
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 34. **FWD**

Typical reverse recovered energy loss as a function of gate resistor

E_{rec} = f(R_g)



With an inductive load at

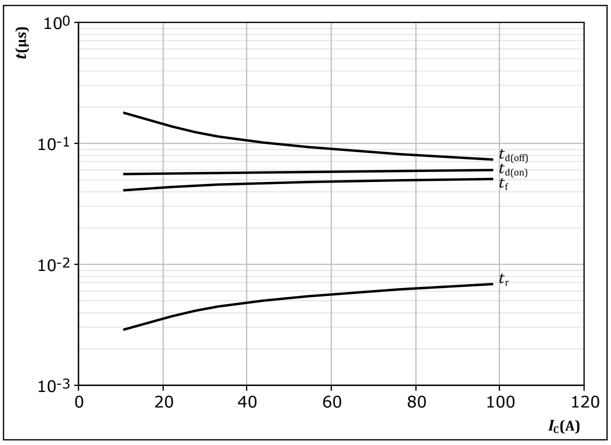
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	55	A		150 °C

Boost Switching Characteristics

figure 35. **IGBT**

Typical switching times as a function of collector current

t = f(I_C)



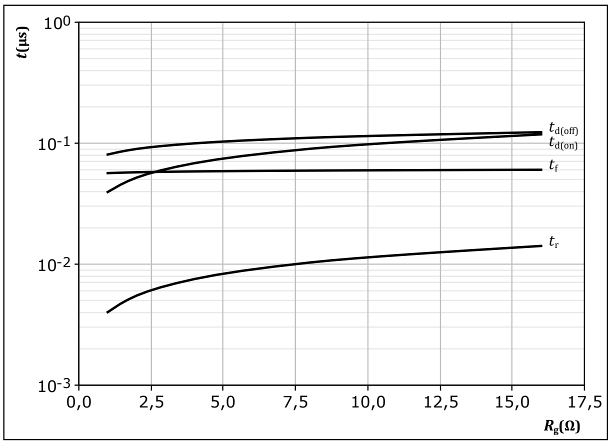
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 36. **IGBT**

Typical switching times as a function of gate resistor

t = f(R_g)



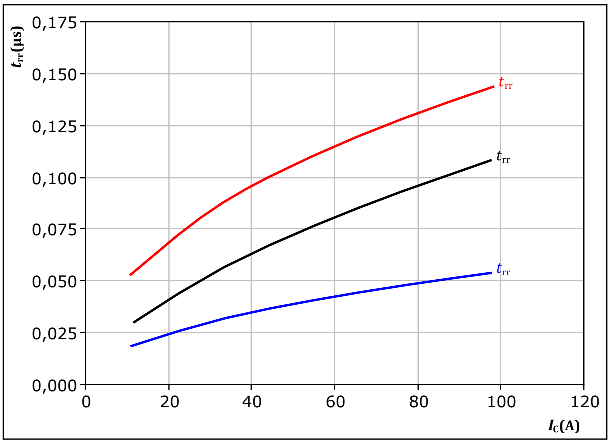
With an inductive load at

T_j =	150	°C
V_{CE} =	350	V
V_{GE} =	±15	V
I_C =	55	A

figure 37. **FWD**

Typical reverse recovery time as a function of collector current

t_{rr} = f(I_C)



With an inductive load at

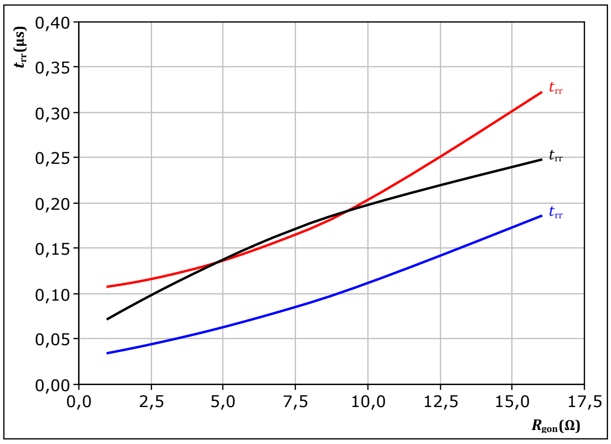
V_{CE} =	350	V
V_{GE} =	±15	V
R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 38. **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 =	55	A

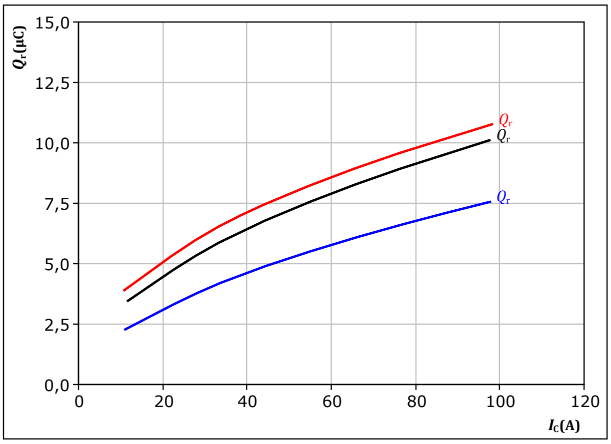
T_j: 25 °C, 125 °C, 150 °C

Boost Switching Characteristics

figure 39. **FWD**

Typical recovered charge as a function of collector current

Q_r = f(I_C)



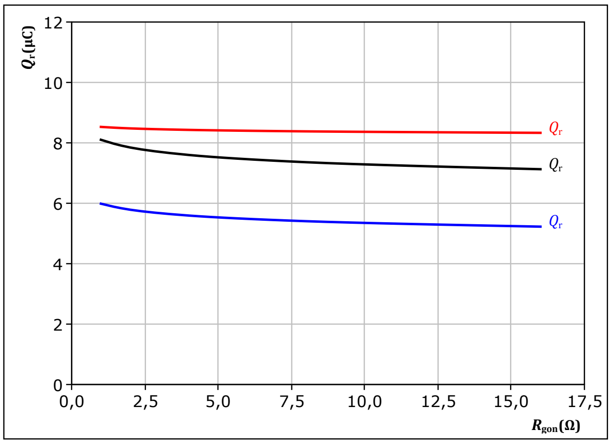
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 40. **FWD**

Typical recovered charge as a function of turn on gate resistor

Q_r = f(R_{gon})



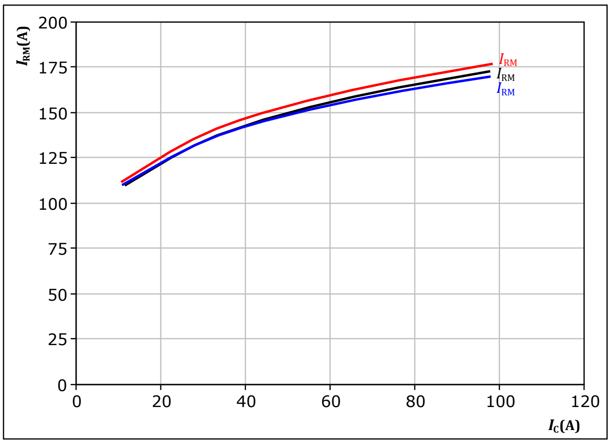
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	55	A		150 °C

figure 41. **FWD**

Typical peak reverse recovery current as a function of collector current

I_{RM} = f(I_C)



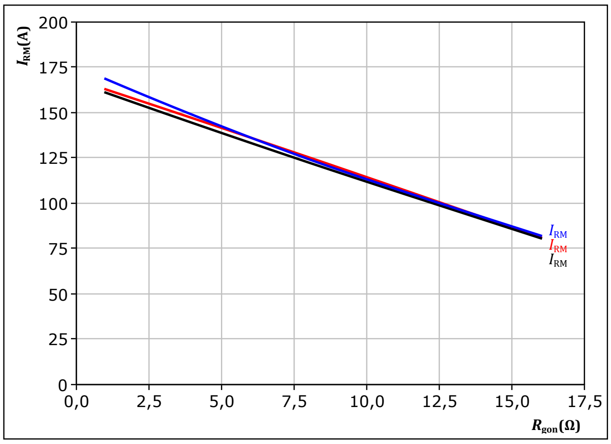
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 42. **FWD**

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

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



With an inductive load at

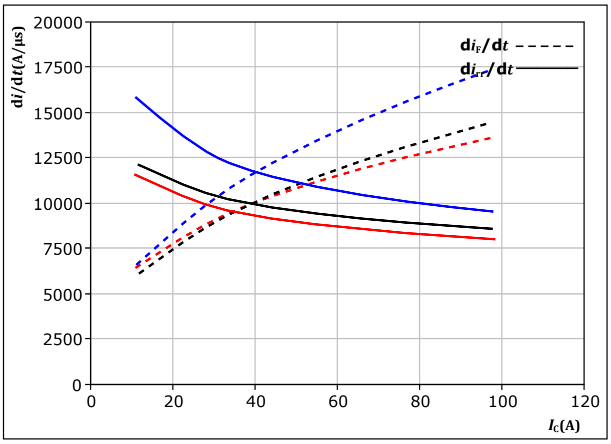
V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	55	A		150 °C

Boost Switching Characteristics

figure 43. **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)



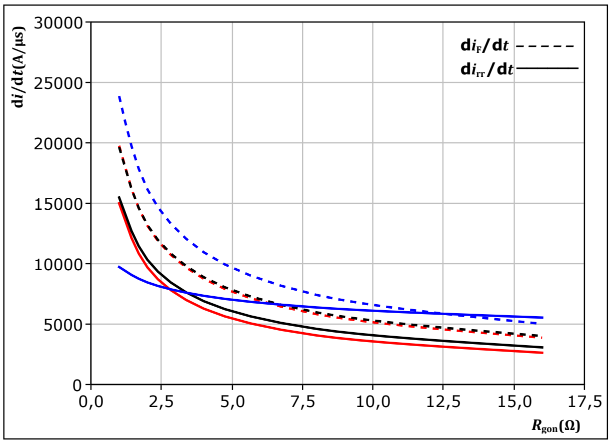
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 44. **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})



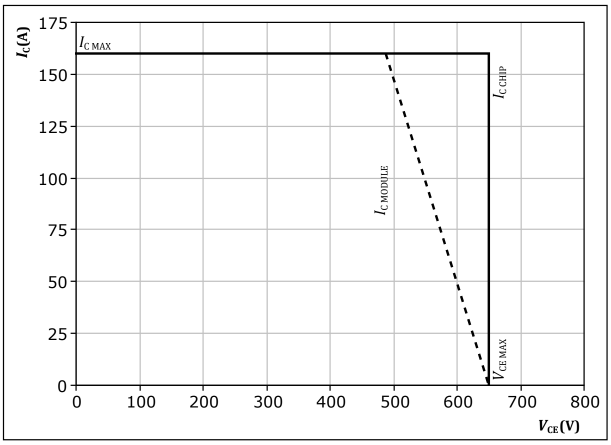
With an inductive load at

V_{CE} =	350	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	55	A		150 °C

figure 45. **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 46. **IGBT**

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

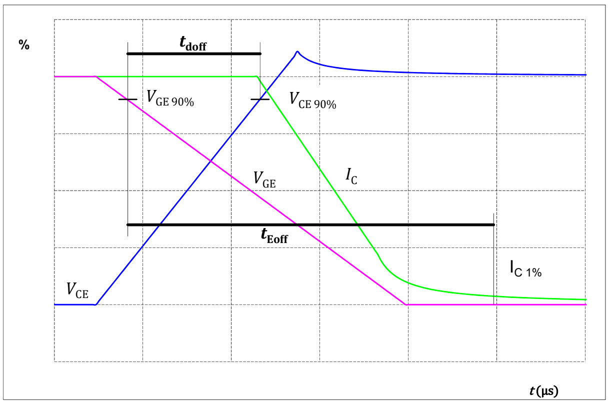


figure 47. **IGBT**

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

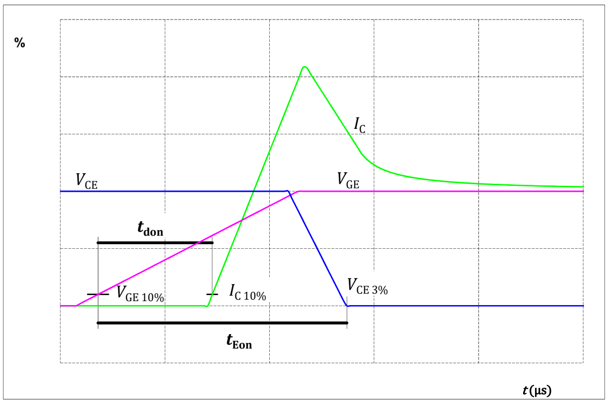


figure 48. **IGBT**

Turn-off Switching Waveforms & definition of t_f

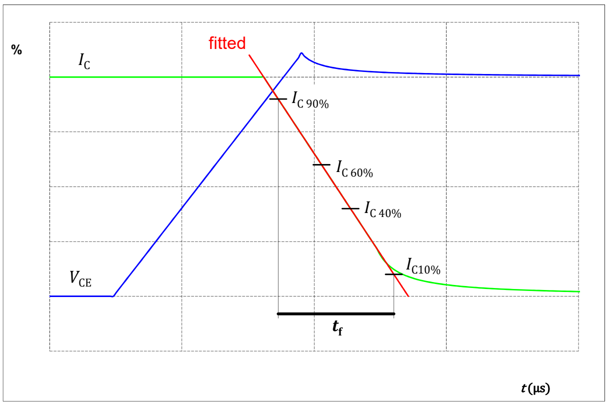
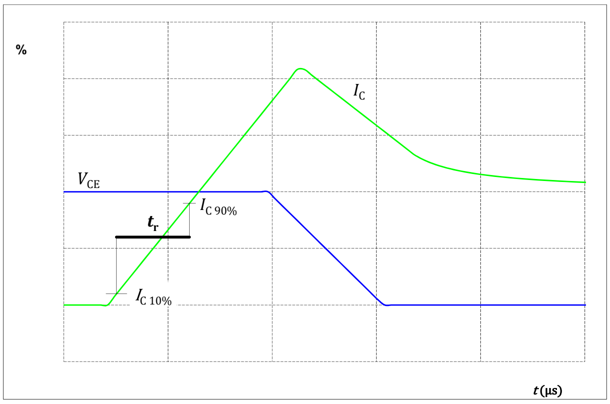


figure 49. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 50. **FWD**

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

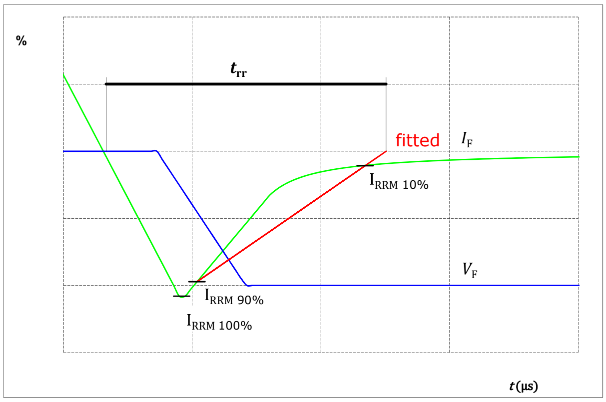
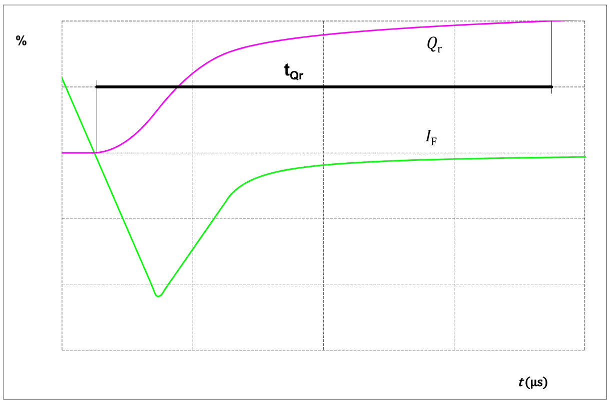


figure 51. **FWD**

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



Ordering Code

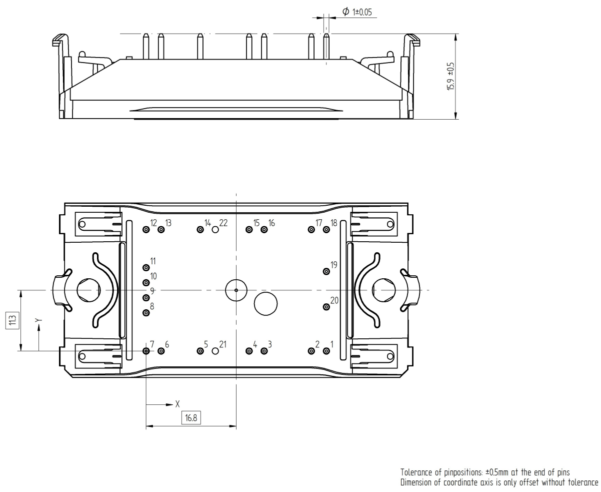
Version	Ordering Code
Without thermal paste	10-FS12NMA080SH08-M260F98
With thermal paste	10-FS12NMA080SH08-M260F98-/7/

Marking

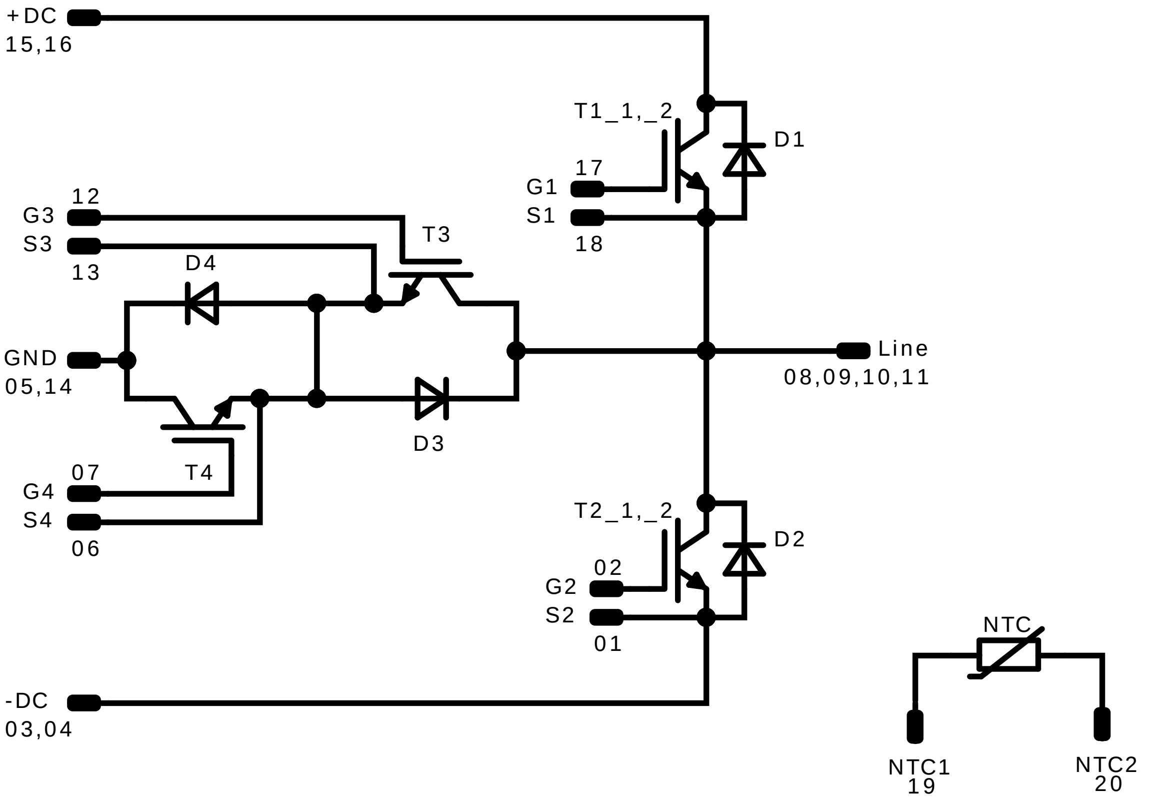
	**Text**	**Name**		**Date code**	**UL & VIN**	**Lot**	**Serial**
		NN-NNNNNNNNNNNNNN-TTTTTTVV		WWYY	UL VIN	LLLLL	SSSS
	Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
		TTTTTTTVV	LLLLL	SSSS	WWYY		

Outline

Pin table [mm]			
Pin	X	Y	Function
1	33,6	0	S2
2	30,8	0	G2
3	22	0	-DC
4	19,2	0	-DC
5	10,1	0	GND
6	2,8	0	S4
7	0	0	G4
8	0	7,1	Line
9	0	9,9	Line
10	0	12,7	Line
11	0	15,5	Line
12	0	22,6	G3
13	2,8	22,6	S3
14	10,1	22,6	GND
15	19,2	22,6	+DC
16	22	22,6	+DC
17	30,8	22,6	G1
18	33,6	22,6	S1
19	33,6	14,8	NTC1
20	33,6	8,2	NTC2
21	not assembled		
22	not assembled		



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T1, T2	IGBT	1200 V	80 A	Buck Switch	
D4, D3	FWD	650 V	80 A	Buck Diode	
T4, T3	IGBT	650 V	80 A	Boost Switch	
D1, D2	FWD	1200 V	50 A	Boost Diode	
NTC	Thermistor			Thermistor	

Packaging instruction					
Standard packaging quantity (SPQ) 135	>SPQ	Standard	<SPQ	Sample	

Handling instruction
Handling instructions for *flow* 0 packages see vincotech.com website.

Package data
Package data for *flow* 0 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-FS12NMA080SH08-M260F98-D1-14	17 Jul. 2019		
10-FS12NMA080SH08-M260F98-D2-14	2 Nov. 2020	Thermal Paste change from PSX to PTM	2-7,9,11,12,14,26