



Vincotech

80-M3126TA100M703-K828F73

datasheet

MiniSKiiP® PACK 3

1200 V / 100 A

Topology features

- Inverter
- Kelvin Emitter for improved switching performance
- Tandem inverter diode
- Temperature sensor

Component features

- Easy paralleling
- Low turn-off losses
- Low collector emitter saturation voltage
- Positive temperature coefficient
- Short tail current
- Switching optimized for EMC

Housing features

- Base isolation: Al_2O_3
- Easy assembly in one mounting step
- Flexible PCB design w/o pin holes
- Rugged solderless spring contacts

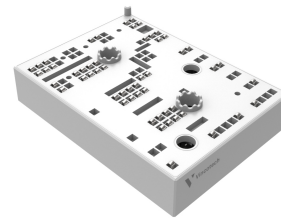
Target applications

- Elevator Drives

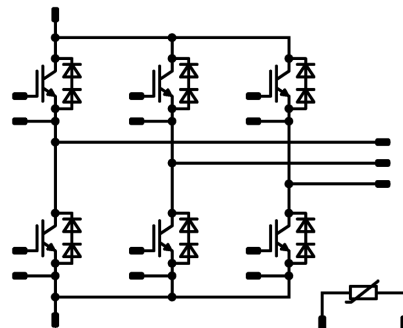
Types

- 80-M3126TA100M703-K828F73

MiniSKiiP® 3 16 mm housing



Schematic





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Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Inverter Switch				
Collector-emitter voltage	V_{CES}		1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	121	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	200	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	240	W
Gate-emitter voltage	V_{GES}		± 20	V
Short circuit ratings	t_{SC}	$V_{GE} = 15\text{ V}$, $V_{CC} = 800\text{ V}$ $T_j = 150\text{ °C}$	9,5	μs
Maximum junction temperature	T_{jmax}		175	$^{\circ}\text{C}$

Inverter Diode

Peak repetitive reverse voltage	V_{RRM}		1300	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	55	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	225	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	136	W
Maximum junction temperature	T_{jmax}		175	$^{\circ}\text{C}$

Module Properties

Thermal Properties

Storage temperature	T_{stg}		-40...+125	$^{\circ}\text{C}$
Operation temperature under switching condition	T_{jop}		-40...+($T_{jmax} - 25$)	$^{\circ}\text{C}$

Isolation Properties

Isolation voltage	V_{isol}	DC Test Voltage* $t_p = 2\text{ s}$	5500	V
Creepage distance		With std lid For more informations see handling instructions	6,3	mm
Clearance		With std lid For more informations see handling instructions	6,3	mm
Comparative Tracking Index	CTI		≥ 600	

*100 % tested in production



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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		

Inverter Switch

Static

Gate-emitter threshold voltage	$V_{GE(th)}$			10	0,01	25	5,4	6	6,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		100	25 125 150		1,53 1,71 1,75	1,85 ⁽¹⁾	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			100	µA
Gate-emitter leakage current	I_{GES}		20	0		25			200	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	0	10		25			21000		pF
Output capacitance	C_{oes}							700		pF
Reverse transfer capacitance	C_{res}							280		pF
Gate charge	Q_g	$V_{CC} = 600$ V	0/15		100	25		700		nC

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 2,5$ W/mK (HPTP)						0,4		K/W
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Dynamic

Turn-on delay time	$t_{d(on)}$	$R_{gon} = 4$ Ω $R_{goff} = 4$ Ω	±15	600	100	25 125 150		174,17 172,88 173,11		ns
Rise time	t_r					25 125 150		43,97 48,84 50,04		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		191,52 217,28 225,26		ns
Fall time	t_f					25 125 150		62,47 88,61 94,32		ns
Turn-on energy (per pulse)	E_{on}					25 125 150		5,51 7,68 8,04		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		6,66 9,02 9,65		mWs



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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	

Inverter Diode

Static

Forward voltage	V_F				75	25 125 150		3,09 2,9 2,84	3,84 ⁽¹⁾	V
Reverse leakage current	I_R	$V_i = 1300$ V				25			3,8	µA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 2,5$ W/mK (HPTP)						0,7		K/W
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Dynamic

Peak recovery current	I_{RM}	$di/dt=1386$ A/µs $di/dt=1641$ A/µs $di/dt=1298$ A/µs	± 15	600	100	25 125 150		27,32 39,62 41,84		A
Reverse recovery time	t_{rr}					25 125 150		96,43 149,07 166,37		ns
Recovered charge	Q_r					25 125 150		1,75 3,85 4,47		µC
Reverse recovered energy	E_{rec}					25 125 150		0,482 1,18 1,41		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		181,45 554,83 421,74		A/µs



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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		1		k Ω
Deviation of R100	$\Delta_{R/R}$	$R_{100} = 1670 \Omega$				100	-2		2	%
Maximum Current	I_{max}							3		mA
Power dissipation constant	d					25		0,76		mW/K
A-value	A							$7,635 \times 10^{-3}$		1/K
B-value	B							$1,73 \times 10^{-5}$		1/K ²
Vincotech Thermistor Reference									E	

⁽¹⁾ Value at chip level

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



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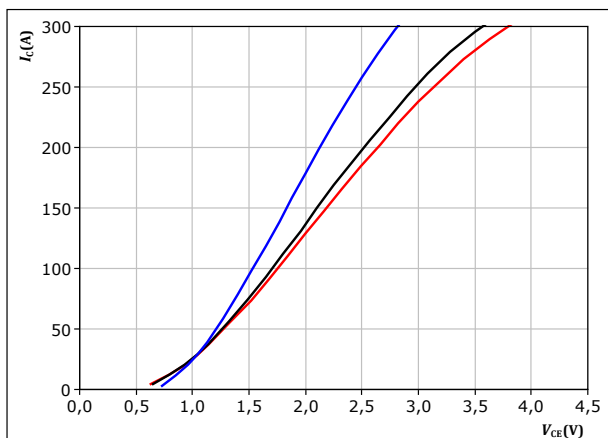
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Inverter Switch Characteristics

figure 1. IGBT

Typical output characteristics

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

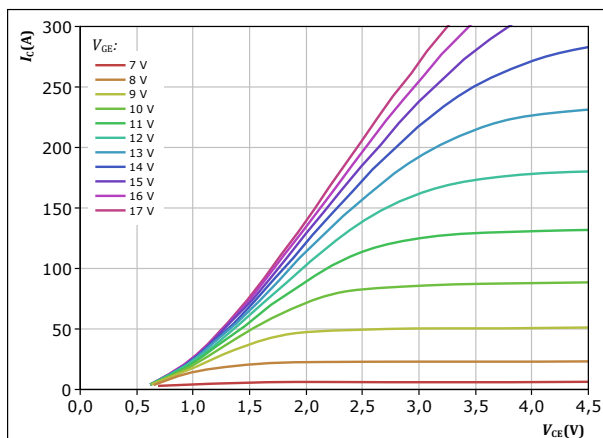


$t_p = 250 \mu s$
 $V_{GE} = 15 V$
 $T_j:$ 25 °C, 125 °C, 150 °C

figure 2. IGBT

Typical output characteristics

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

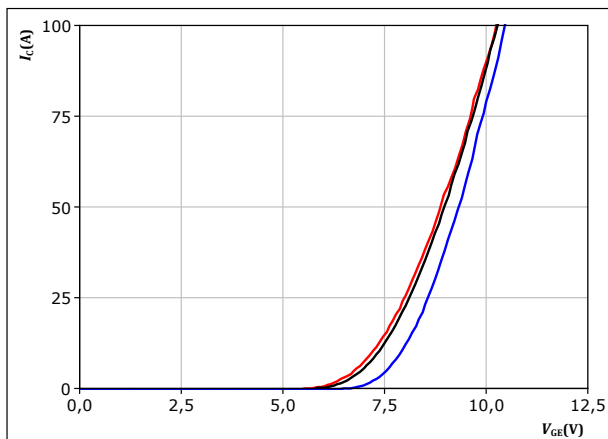


$t_p = 250 \mu s$
 $T_j = 150 ^\circ C$
 V_{GE} from 7 V to 17 V in steps of 1 V

figure 3. IGBT

Typical transfer characteristics

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

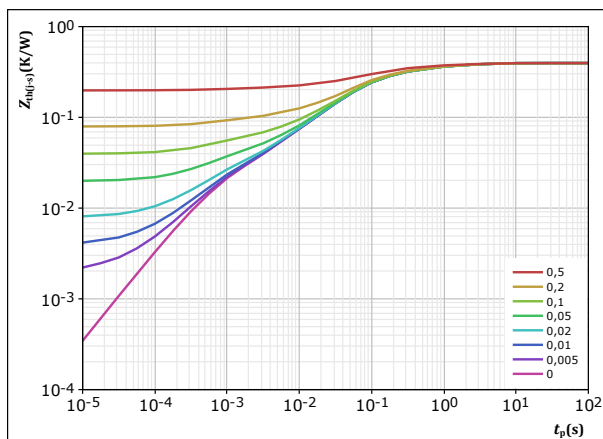


$t_p = 250 \mu s$
 $V_{CE} = 10 V$
 $T_j:$ 25 °C, 125 °C, 150 °C

figure 4. IGBT

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$
 $R_{th(j-s)} = 0,396 K/W$
IGBT thermal model values

$R (K/W)$	$\tau (s)$
3,88E-02	2,55E+00
9,12E-02	3,93E-01
2,11E-01	6,52E-02
3,64E-02	9,40E-03
1,85E-02	6,78E-04



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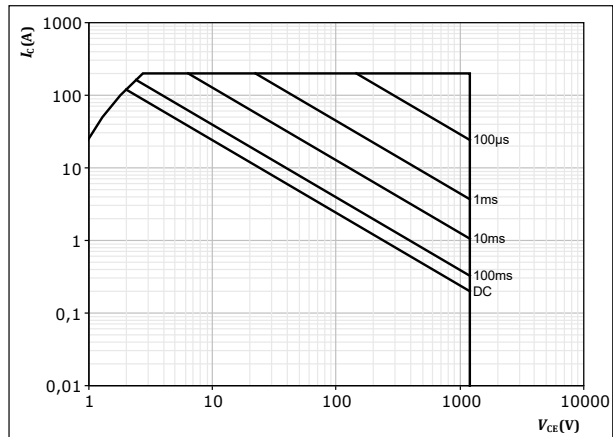
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Inverter Switch Characteristics

figure 5. IGBT

Safe operating area

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

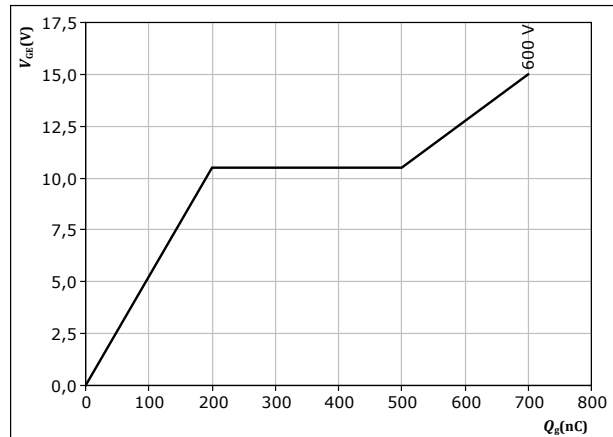


$D =$ single pulse
 $T_s = 80$ °C
 $V_{GE} = 15$ V
 $T_j = T_{jmax}$

figure 6. IGBT

Gate voltage vs gate charge

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



$I_C = 100$ A
 $T_j = 25$ °C



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Inverter Diode Characteristics

figure 7.

FWD

Typical forward characteristics

$$I_F = f(V_F)$$

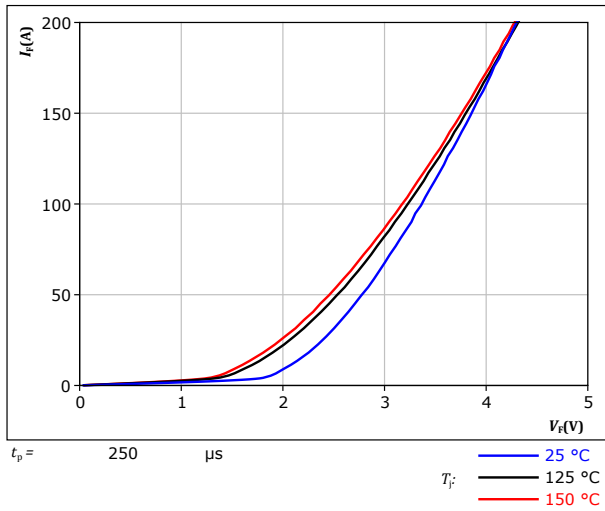
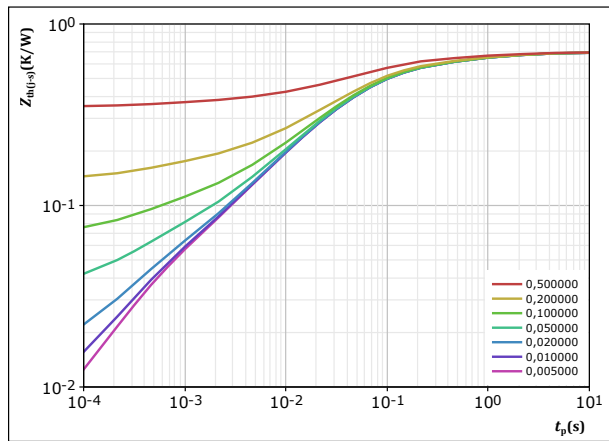


figure 8.

FWD

Transient thermal impedance as a function of pulse width

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





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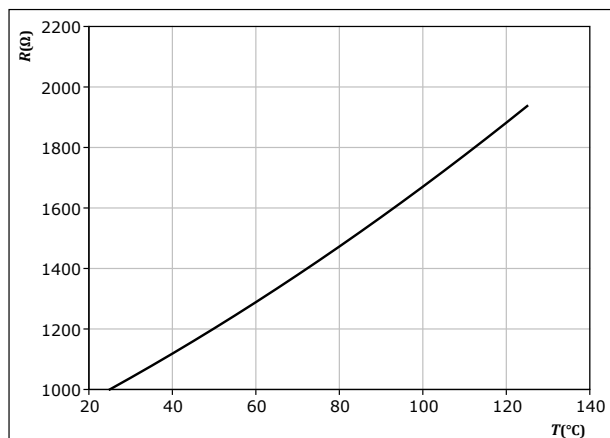
Thermistor Characteristics

figure 9.

Thermistor

Typical PTC characteristic as function of temperature

$$R_T = f(T)$$





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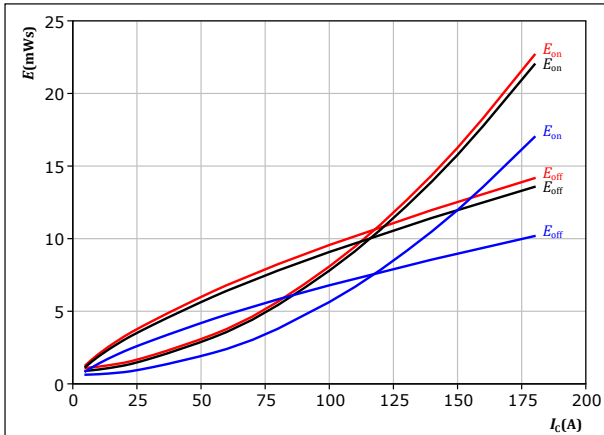
Inverter Switching Characteristics

figure 10.

IGBT

Typical switching energy losses as a function of collector current

$$E = f(I_c)$$



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 4 \text{ } \Omega$
 $R_{goff} = 4 \text{ } \Omega$

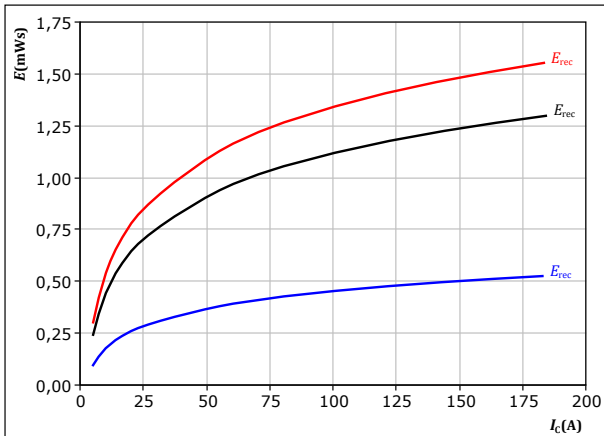
T_j : $25 \text{ } ^\circ\text{C}$
 $125 \text{ } ^\circ\text{C}$
 $150 \text{ } ^\circ\text{C}$

figure 12.

FWD

Typical reverse recovered energy loss as a function of collector current

$$E_{rec} = f(I_c)$$



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 4 \text{ } \Omega$

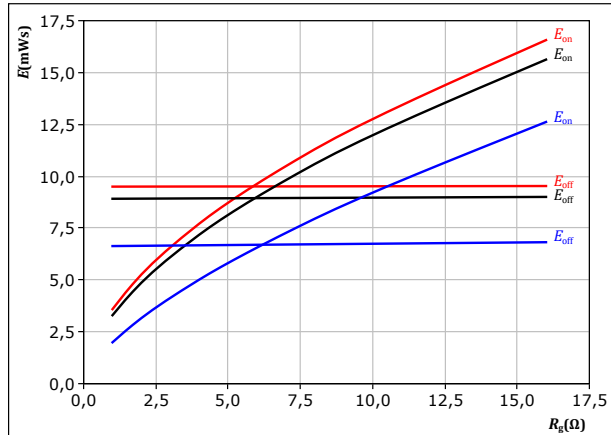
T_j : $25 \text{ } ^\circ\text{C}$
 $125 \text{ } ^\circ\text{C}$
 $150 \text{ } ^\circ\text{C}$

figure 11.

IGBT

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

$$E = f(R_g)$$



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 100 \text{ A}$

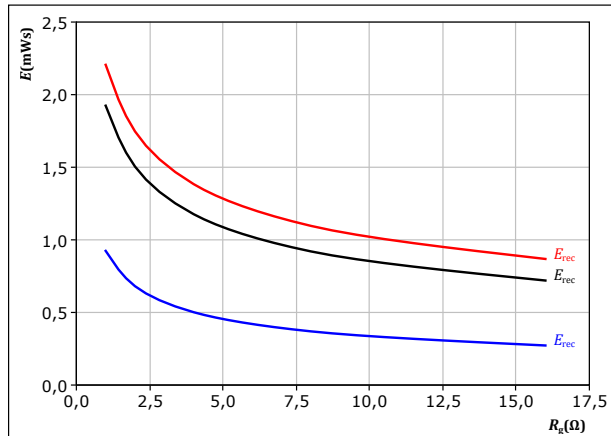
T_j : $25 \text{ } ^\circ\text{C}$
 $125 \text{ } ^\circ\text{C}$
 $150 \text{ } ^\circ\text{C}$

figure 13.

FWD

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

$$E_{rec} = f(R_g)$$



With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_c = 100 \text{ A}$

T_j : $25 \text{ } ^\circ\text{C}$
 $125 \text{ } ^\circ\text{C}$
 $150 \text{ } ^\circ\text{C}$



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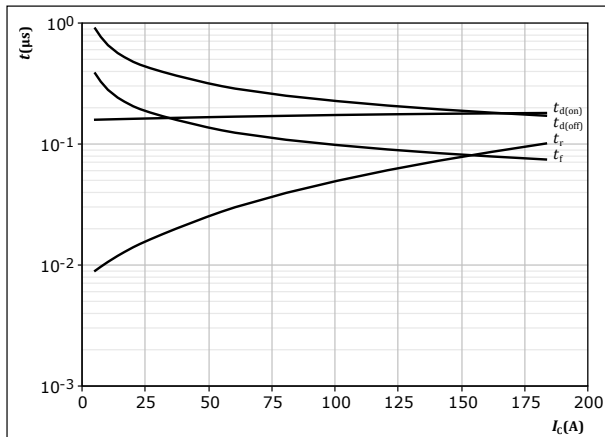
Inverter Switching Characteristics

figure 14.

IGBT

Typical switching times as a function of collector current

$$t = f(I_c)$$



With an inductive load at

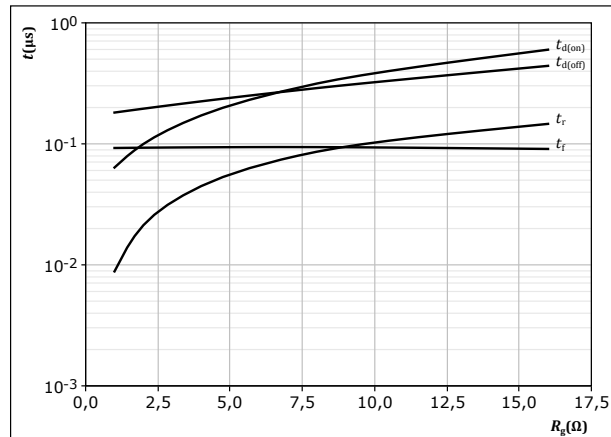
$T_j = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 4$ Ω
 $R_{goff} = 4$ Ω

figure 15.

IGBT

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

$$t = f(R_g)$$



With an inductive load at

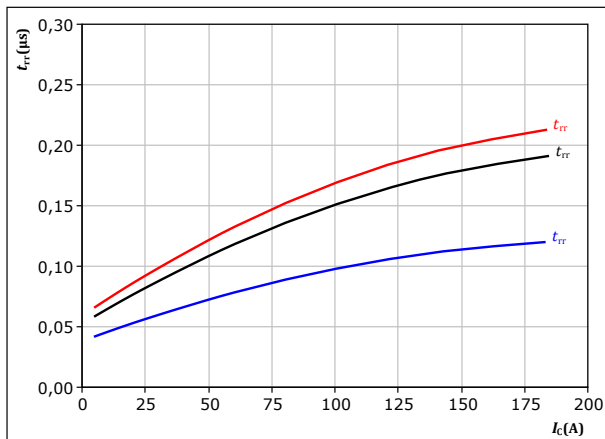
$T_j = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 100$ A

figure 16.

FWD

Typical reverse recovery time as a function of collector current

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



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 4$ Ω

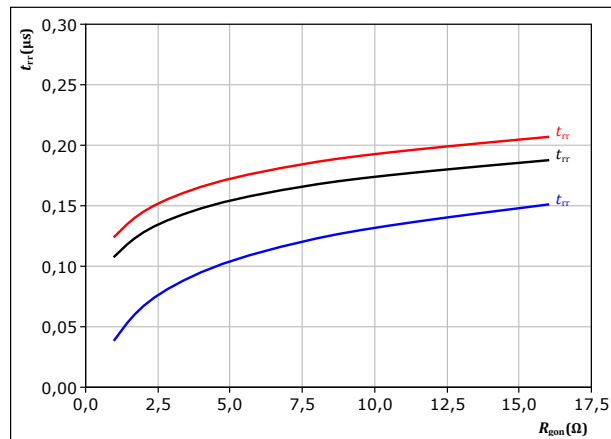
T_j : — 25 °C
— 125 °C
— 150 °C

figure 17.

FWD

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

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



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 100$ A

T_j : — 25 °C
— 125 °C
— 150 °C



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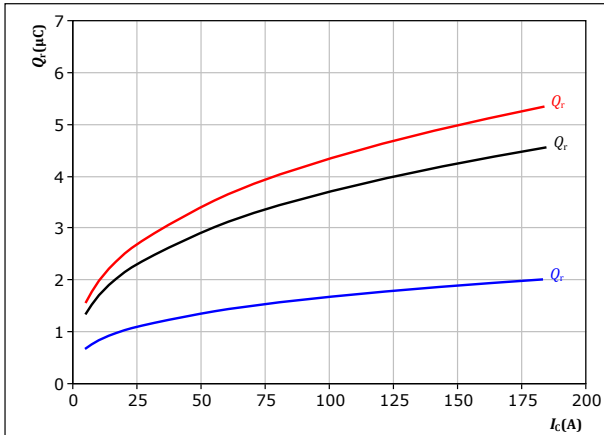
Inverter Switching Characteristics

figure 18.

FWD

Typical recovered charge as a function of collector current

$$Q_r = f(I_c)$$



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 4$ Ω

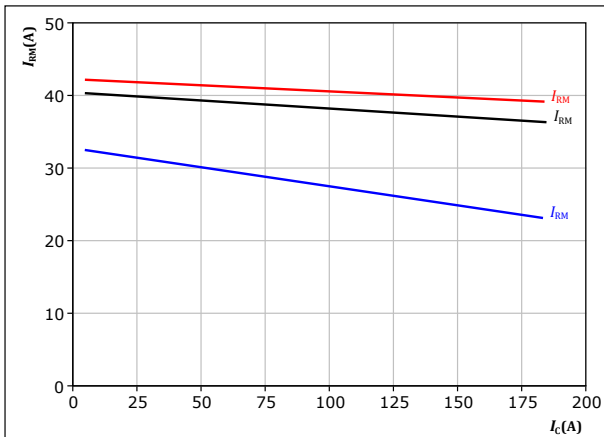
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 20.

FWD

Typical peak reverse recovery current as a function of collector current

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



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 4$ Ω

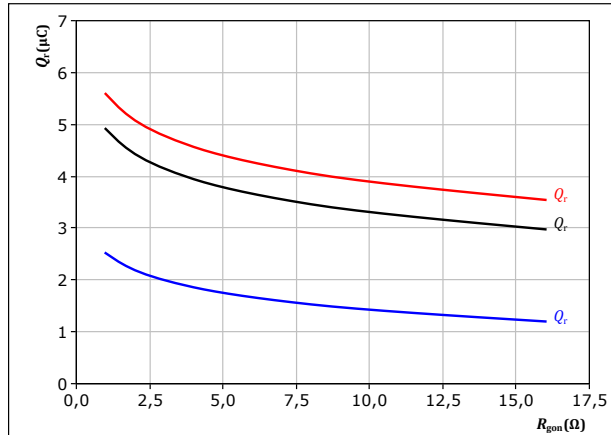
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 19.

FWD

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

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



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 100$ A

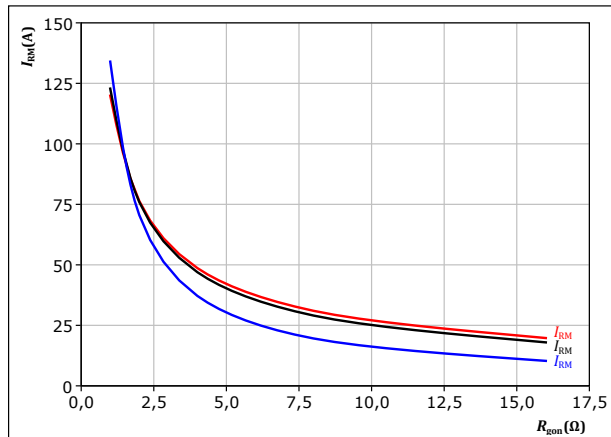
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 21.

FWD

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

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



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_c = 100$ A

T_j :
— 25 °C
— 125 °C
— 150 °C



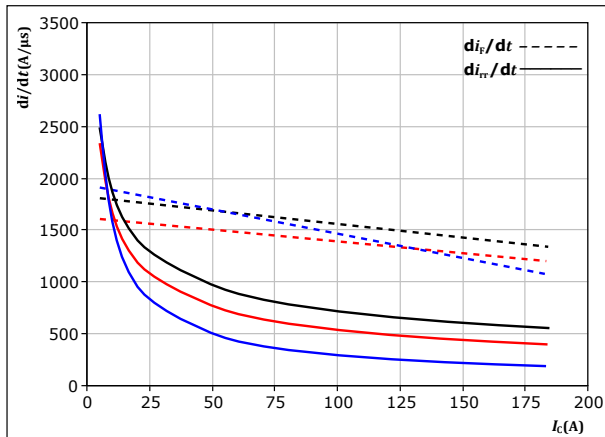
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Inverter Switching Characteristics

figure 22. FWD

Typical rate of fall of forward and reverse recovery current as a function of collector current
 $di_f/dt, di_r/dt = f(I_C)$

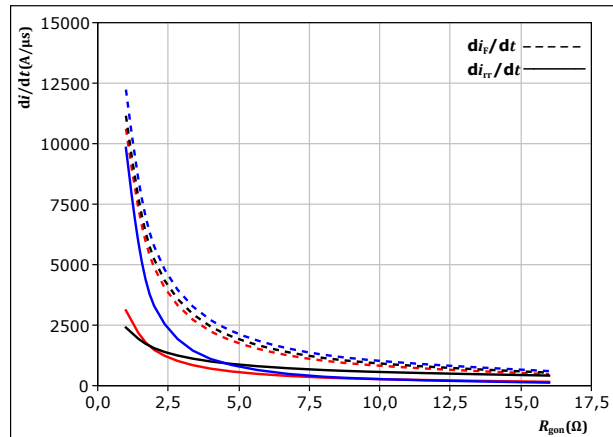


With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 4$ Ω
 $T_j = 25^\circ\text{C}$
 $T_j = 125^\circ\text{C}$
 $T_j = 150^\circ\text{C}$

figure 23. FWD

Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_f/dt, di_r/dt = f(R_{gon})$



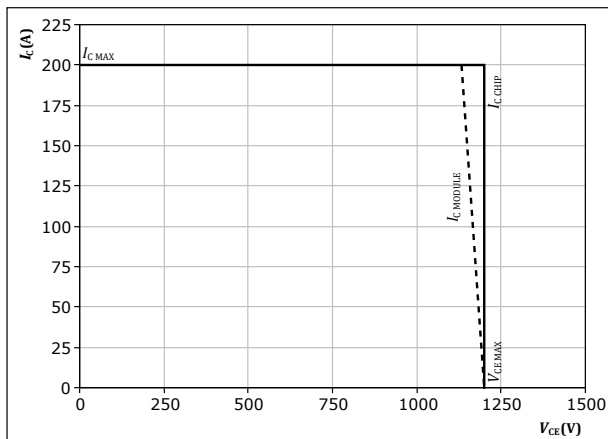
With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_C = 100$ A
 $T_j = 25^\circ\text{C}$
 $T_j = 125^\circ\text{C}$
 $T_j = 150^\circ\text{C}$

figure 24. IGBT

Reverse bias safe operating area

$I_C = f(V_{CE})$



At $T_j = 150^\circ\text{C}$
 $R_{gon} = 4$ Ω
 $R_{goff} = 4$ Ω



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Inverter Switching Definitions

figure 25. IGBT

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

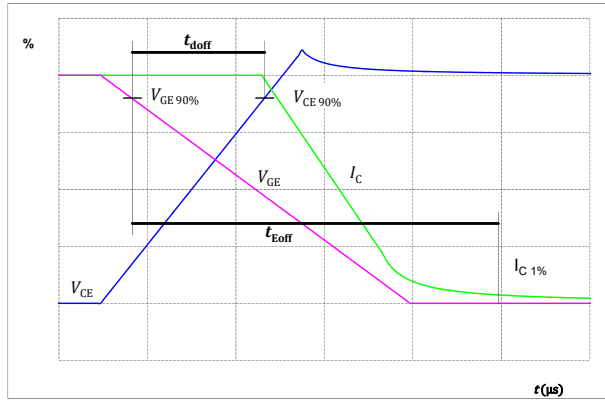


figure 26. IGBT

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

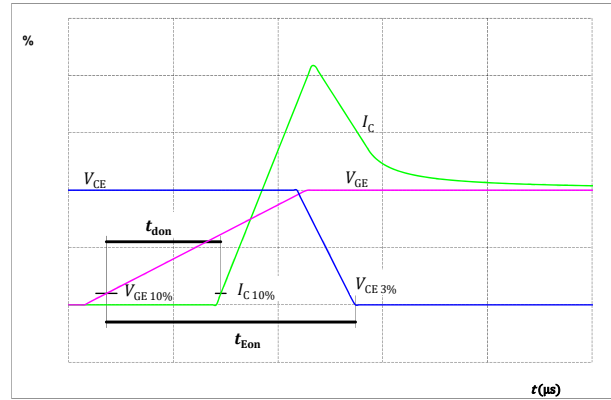


figure 27. IGBT

Turn-off Switching Waveforms & definition of t_f

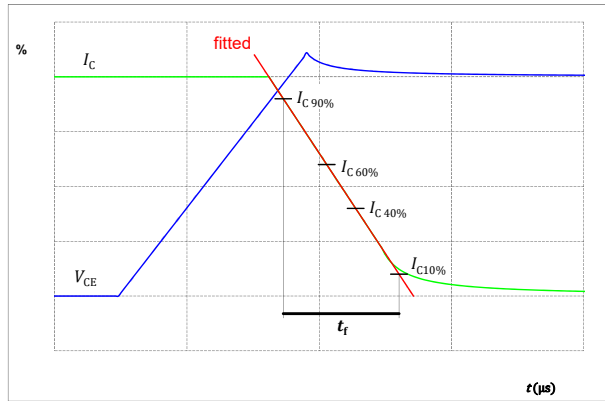
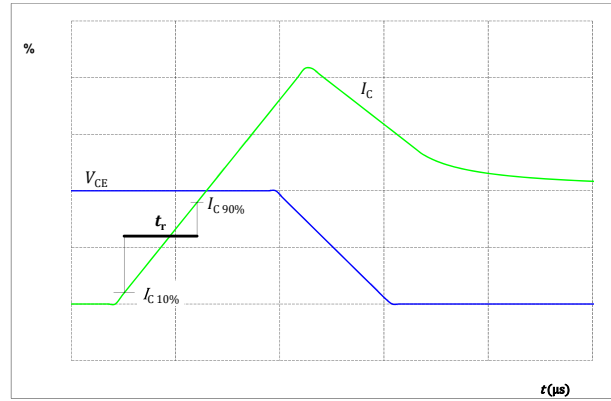


figure 28. IGBT

Turn-on Switching Waveforms & definition of t_r





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Inverter Switching Definitions

figure 29.

FWD

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

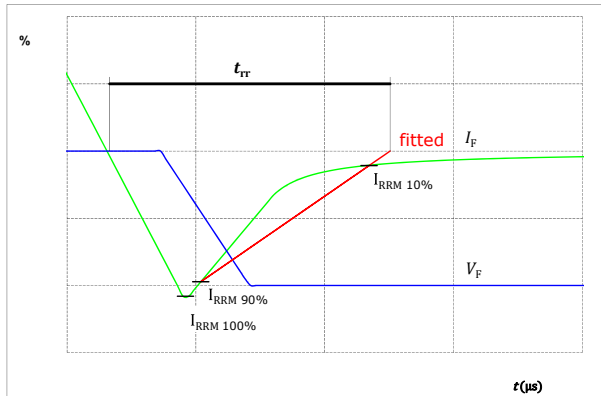
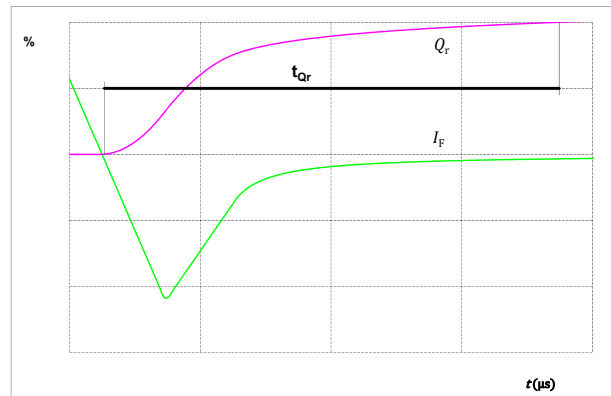


figure 30.

FWD

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





datasheet

Ordering Code	
Version	Ordering Code
With std lid (6.5mm height) + no thermal grease	80-M3126TA100M703-K828F73-/0A/
With thin lid (2.8mm height) + no thermal grease	80-M3126TA100M703-K828F73-/0B/
With std lid (6.5mm height) + thermal grease (0,8 W/mK, P12, silicone-based)	80-M3126TA100M703-K828F73-/1A/
With thin lid (2.8mm height) + thermal grease (0,8 W/mK, P12, silicone-based)	80-M3126TA100M703-K828F73-/1B/
With std lid (6.5mm height) + thermal grease (2,5 W/mK, TG20032, silicone-free)	80-M3126TA100M703-K828F73-/4A/
With thin lid (2.8mm height) + thermal grease (2,5 W/mK, TG20032, silicone-free)	80-M3126TA100M703-K828F73-/4B/
With std lid (6.5mm height) + thermal grease (2,5 W/mK, HPTP, silicone-based)	80-M3126TA100M703-K828F73-/5A/
With thin lid (2.8mm height) + thermal grease (2,5 W/mK, HPTP, silicone-based)	80-M3126TA100M703-K828F73-/5B/

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

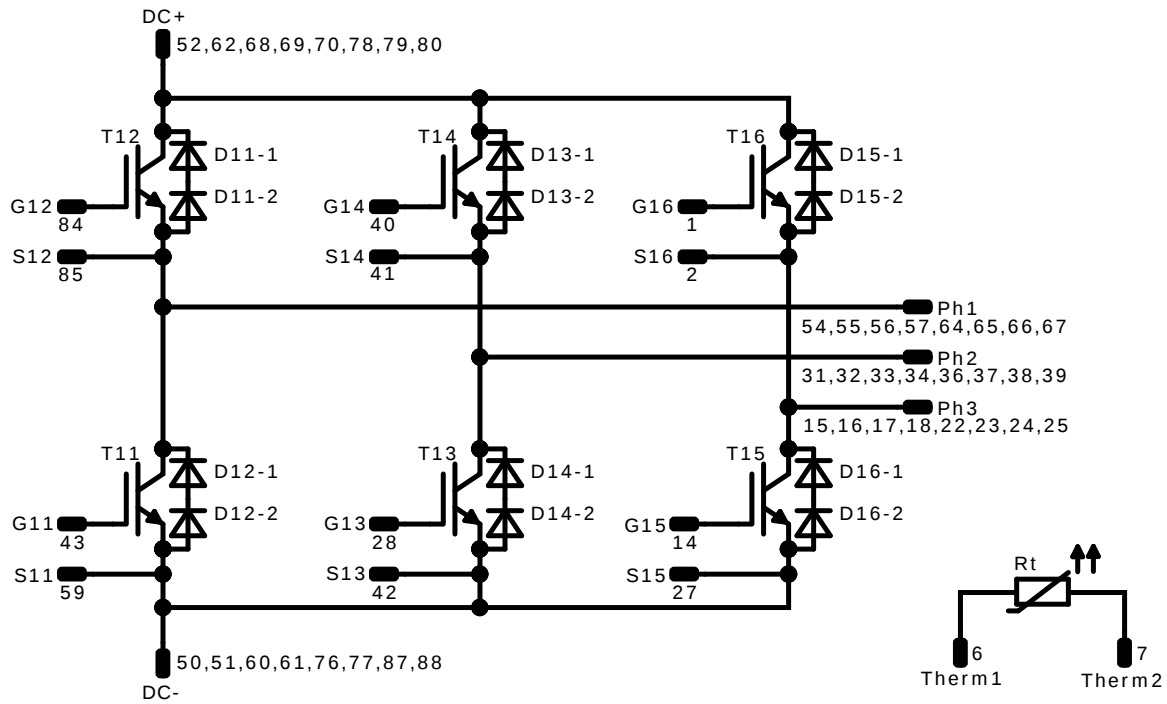
Outline						
Pin table [mm]						
Pin	X	Y	Function	45	not assembled	
1	15,83	-25,3	G16	46	not assembled	
2	15,83	-6,4	S16	47	not assembled	
3	not assembled			48	not assembled	
4	not assembled			49	not assembled	
5	not assembled			50	-35,68	22,1 DC-
6	15,83	6,4	Therm1	51	-35,68	25,3 DC-
7	15,83	15,7	Therm2	52	-36,58	-25,3 DC+
8	not assembled			53	not assembled	
9	not assembled			54	-36,58	-15,7 Ph1
10	not assembled			55	-36,58	-12,5 Ph1
11	not assembled			56	-36,58	-9,3 Ph1
12	not assembled			57	-36,58	-6,1 Ph1
13	not assembled			58	not assembled	
14	8,13	25,3	G15	59	-39,32	18,9 S11
15	1,82	-15,38	Ph3	60	-39,32	22,1 DC-
16	1,82	-12,18	Ph3	61	-39,32	25,3 DC-
17	1,82	-8,98	Ph3	62	-40,22	-25,3 DC+
18	1,82	-5,79	Ph3	63	not assembled	
19	not assembled			64	-40,22	-15,7 Ph1
20	not assembled			65	-40,22	-12,5 Ph1
21	not assembled			66	-40,22	-9,3 Ph1
22	-1,82	-15,38	Ph3	67	-40,22	-6,09 Ph1
23	-1,82	-12,18	Ph3	68	-50,18	-25,3 DC+
24	-1,82	-8,98	Ph3	69	-50,18	-22,1 DC+
25	-1,82	-5,79	Ph3	70	-50,18	-18,9 DC+
26	not assembled			71	not assembled	
27	-7,27	22,1	S15	72	not assembled	
28	-7,27	25,3	G13	73	not assembled	
29	not assembled			74	not assembled	
30	not assembled			75	not assembled	
31	-16,05	-15,02	Ph2	76	-50,18	22,1 DC-
32	-16,05	-11,82	Ph2	77	-50,18	25,3 DC-
33	-16,05	-8,63	Ph2	78	-53,82	-25,3 DC+
34	-16,05	-5,42	Ph2	79	-53,82	-22,1 DC+
35	not assembled			80	-53,82	-18,9 DC+
36	-19,7	-15,02	Ph2	81	not assembled	
37	-19,7	-11,82	Ph2	82	not assembled	
38	-19,7	-8,62	Ph2	83	not assembled	
39	-19,7	-5,42	Ph2	84	-53,82	3,1 G12
40	-22,26	-1	G14	85	-53,82	6,3 S12
41	-22,26	2,2	S14	86	not assembled	
42	-22,67	22,1	S13	87	-53,82	22,1 DC-
43	-22,67	25,3	G11	88	-53,82	25,3 DC-
44	not assembled					

Pad positions refers to center point. For more informations on pad design please see package data



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Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14, T15, T16	IGBT	1200 V	100 A	Inverter Switch	
D11, D12, D13, D14, D15, D16	FWD	1300 V	75 A	Inverter Diode	
Rt	PTC			Thermistor	



Vincotech

80-M3126TA100M703-K828F73
datasheet

Packaging instruction				
Standard packaging quantity (SPQ) 48	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for MiniSKiiP® 3 packages see vincotech.com website.

Package data
Package data for MiniSKiiP® 3 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 UL 1557 recognized under E192116 up to a junction temperature under switching condition $T_{j,op}=150^{\circ}\text{C}$ and up to 2500VAC/1min isolation voltage. For more information see vincotech.com website.



Document No.:	Date:	Modification:	Pages
80-M3126TA100M703-K828F73-D1-14	5 Aug. 2026	Initial Release	

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