



Vincotech

10-RZ126PA008SC-M627F41

datasheet

flow90PACK 0

1200 V / 8 A

Topology features

- Inverter
- Open Emitter configuration
- Temperature sensor

Component features

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

Housing features

- Base isolation: Al_2O_3
- 90° mounting angle between heatsink and PCB
- Screw-on heatsink mounting
- Thermo-mechanical push-and-pull force relief
- Solder pin

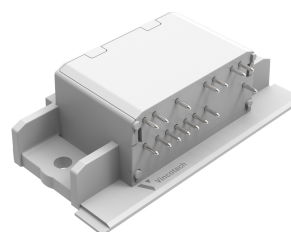
Target applications

- Standard Drive
- Servo Drive
- Bookshelf Inverter

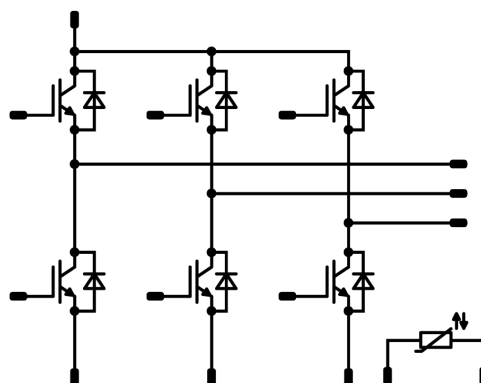
Types

- 10-RZ126PA008SC-M627F41

flow90 0 housing



Schematic





Vincotech

10-RZ126PA008SC-M627F41
datasheet

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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	14	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	24	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	51	W
Gate-emitter voltage	V_{GES}		± 20	V
Short circuit ratings	t_{SC}	$V_{GE} = 15\text{ V}$, $V_{CC} = 800\text{ V}$ $T_j = 150\text{ °C}$	10	μs
Maximum junction temperature	T_{jmax}		175	$^{\circ}\text{C}$

Inverter Diode

Peak repetitive reverse voltage	V_{RRM}		1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	20	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	20	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	49	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* $t_p = 2\text{ s}$	6000	V
Isolation voltage	V_{isol}	AC Voltage $t_p = 1\text{ min}$	2500	V
Creepage distance			> 12,7	mm
Clearance			10,93	mm
Comparative Tracking Index	CTI		≥ 200	

*100 % tested in production



Vincotech

10-RZ126PA008SC-M627F41
datasheet

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	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,00015	25	5,3	5,8	6,3	V
Collector-emitter saturation voltage	$V_{CE(sat)}$		15		8	25 125 150	1,58	1,91 2,14 2,22	2,07 ⁽¹⁾	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			1	µA
Gate-emitter leakage current	I_{GES}		20	0		25			120	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	$f = 1 \text{ Mhz}$	0	25		25		490		pF
Reverse transfer capacitance	C_{res}							30		pF

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 3,4 \text{ W/mK}$ (PSX)						1,85		K/W
--	---------------	---	--	--	--	--	--	------	--	-----

Dynamic

Turn-on delay time	$t_{d(on)}$	$R_{gon} = 32 \Omega$ $R_{goff} = 32 \Omega$	± 15	600	8	25 150		55 54		ns
Rise time	t_r					25 150		22,6 24,4		ns
Turn-off delay time	$t_{d(off)}$					25 150		176,8 240,4		ns
Fall time	t_f					25 150		66,98 120,68		ns
Turn-on energy (per pulse)	E_{on}					25 150		0,555 0,87		mWs
Turn-off energy (per pulse)	E_{off}					25 150		0,434 0,733		mWs



Vincotech

10-RZ126PA008SC-M627F41
datasheet

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				10	25 150	1,35	1,83 1,75	2,05 ⁽¹⁾	V
Reverse leakage current	I_R	$V_r = 1200$ V				25			2,7	μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,95		K/W
--	---------------	---------------------------------------	--	--	--	--	--	------	--	-----

Dynamic

Peak recovery current	I_{RRM}	$di/dt=362$ A/μs $di/dt=293$ A/μs	± 15	600	8	25 150		7,09 9,08		A
Reverse recovery time	t_{rr}					25 150		246,73 428,03		ns
Recovered charge	Q_r					25 150		0,852 1,77		μC
Reverse recovered energy	E_{rec}					25 150		0,327 0,714		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 150		79,73 44,4		A/μs



Vincotech

10-RZ126PA008SC-M627F41
datasheet

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		4,7		kΩ
Deviation of R_{100}	$\Delta_{R/R}$	$R_{100} = 426 \Omega$				100	-12		11	%
Power dissipation	P							200		mW
Power dissipation constant	d					25		2		mW/K
B-value	$B_{(25/50)}$	Tol. $\pm 3 \%$						3500		K
B-value	$B_{(25/100)}$	Tol. $\pm 3 \%$						3560		K
Vincotech Thermistor Reference									G	

⁽¹⁾ Value at chip level

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



Vincotech

10-RZ126PA008SC-M627F41 datasheet

Inverter Switch Characteristics

figure 1. IGBT

Typical output characteristics

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

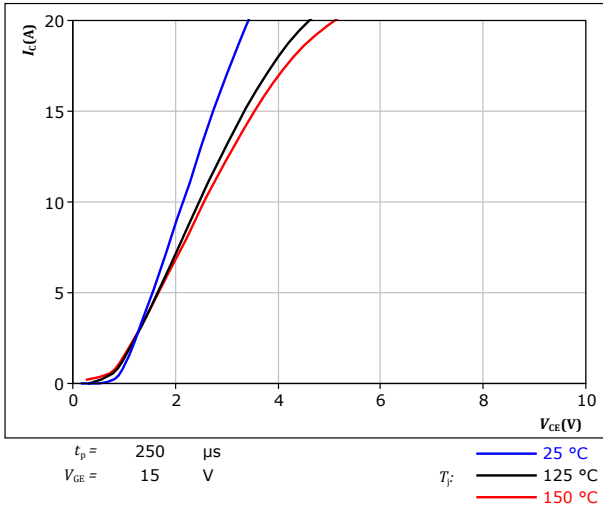


figure 2. IGBT

Typical output characteristics

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

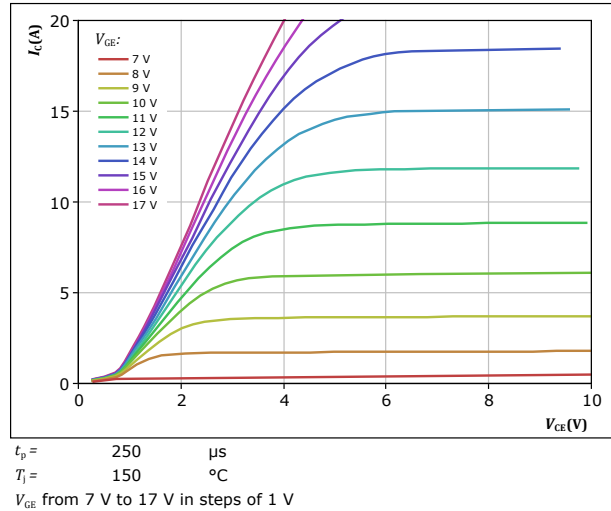


figure 3. IGBT

Typical transfer characteristics

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

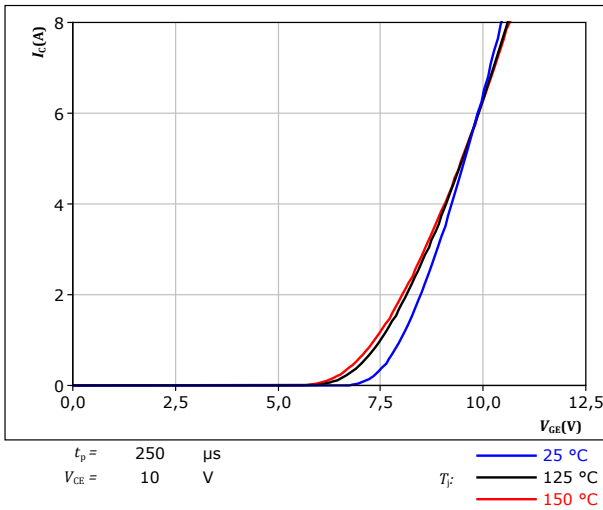
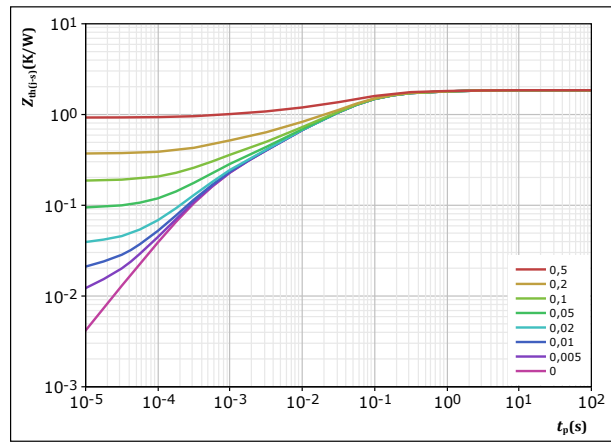


figure 4. IGBT

Transient thermal impedance as a function of pulse width

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



IGBT thermal model values	
R (K/W)	τ (s)
1,07E-01	1,43E+00
3,06E-01	1,62E-01
8,20E-01	4,85E-02
2,99E-01	1,03E-02
1,69E-01	2,84E-03
1,52E-01	4,86E-04



Vincotech

10-RZ126PA008SC-M627F41
datasheet

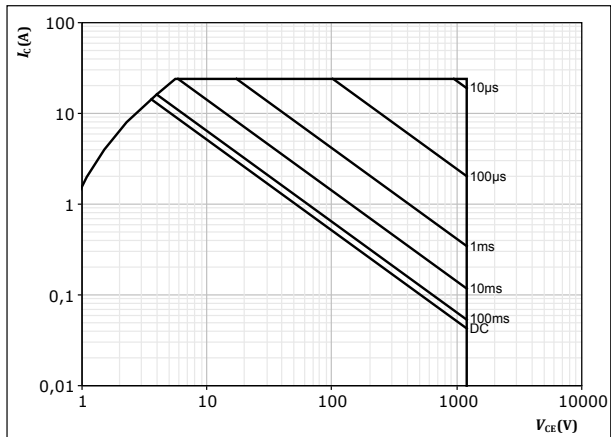
Inverter Switch Characteristics

figure 5.

IGBT

Safe operating area

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



D = single pulse

$T_s = 80$ °C

$V_{GE} = 15$ V

$T_j = T_{jmax}$



Vincotech

10-RZ126PA008SC-M627F41 datasheet

Inverter Diode Characteristics

figure 6. FWD

Typical forward characteristics

$$I_F = f(V_F)$$

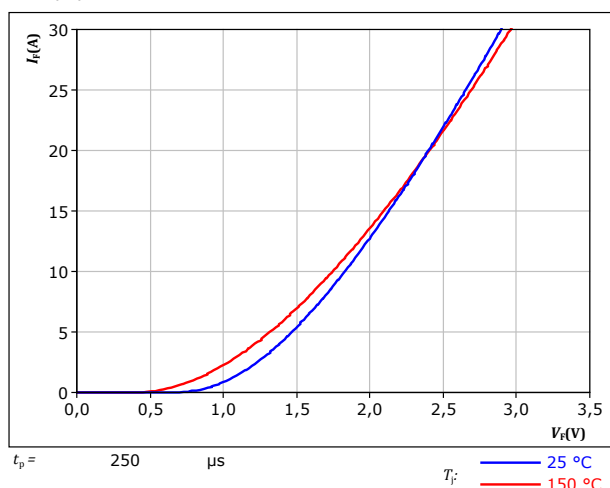
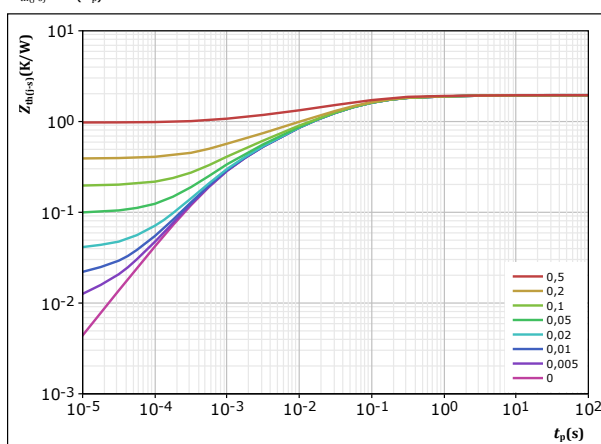


figure 7. FWD

Transient thermal impedance as a function of pulse width

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



$D =$	t_p / T	
$R_{th(j-s)} =$	1,952	K/W
FWD thermal model values		
R (K/W)	τ (s)	
5,14E-02	4,05E+00	
1,26E-01	5,34E-01	
6,86E-01	7,62E-02	
5,26E-01	1,70E-02	
3,32E-01	3,96E-03	
2,31E-01	7,27E-04	



Vincotech

10-RZ126PA008SC-M627F41
datasheet

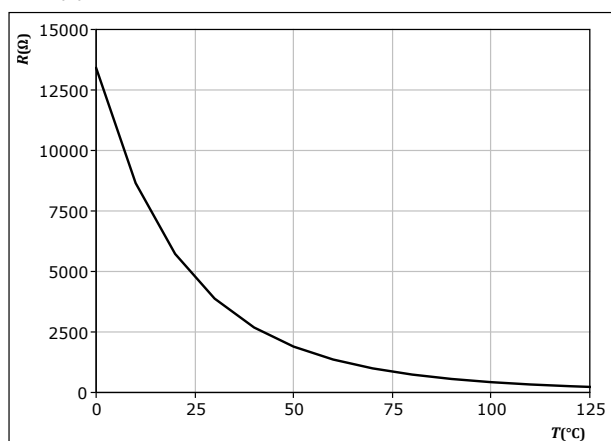
Thermistor Characteristics

figure 8.

Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$





Vincotech

10-RZ126PA008SC-M627F41 datasheet

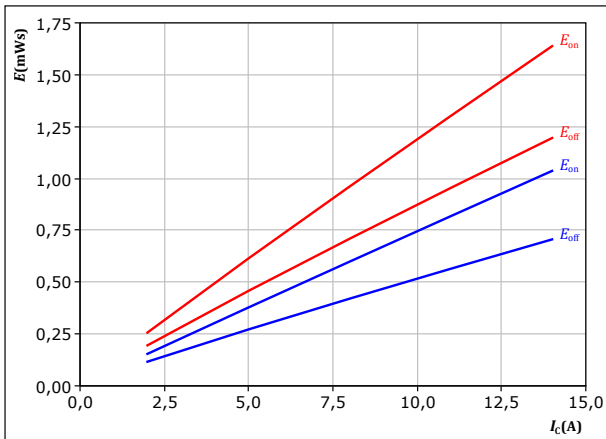
Inverter Switching Characteristics

figure 9.

IGBT

Typical switching energy losses as a function of collector current

$$E = f(I_C)$$



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 $R_{goff} = 32$ Ω

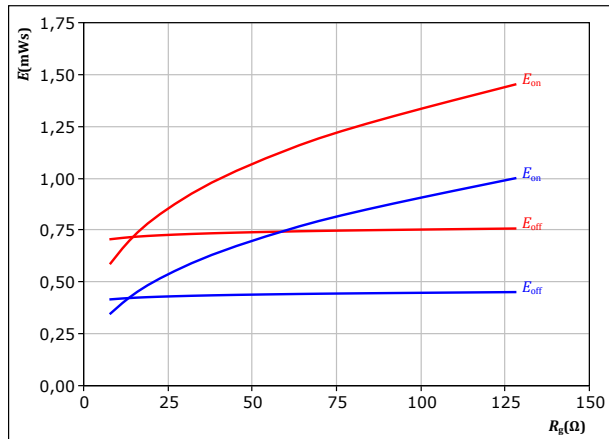
T_j : — 25 °C
— 150 °C

figure 10.

IGBT

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

$$E = f(R_g)$$



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_C = 8$ A

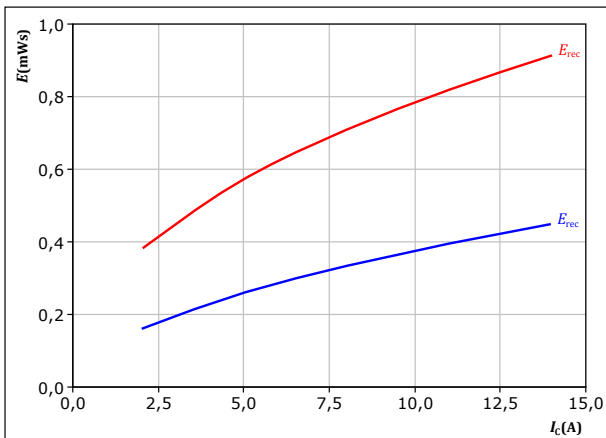
T_j : — 25 °C
— 150 °C

figure 11.

FWD

Typical reverse recovered energy loss as a function of collector current

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



With an inductive load at

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω

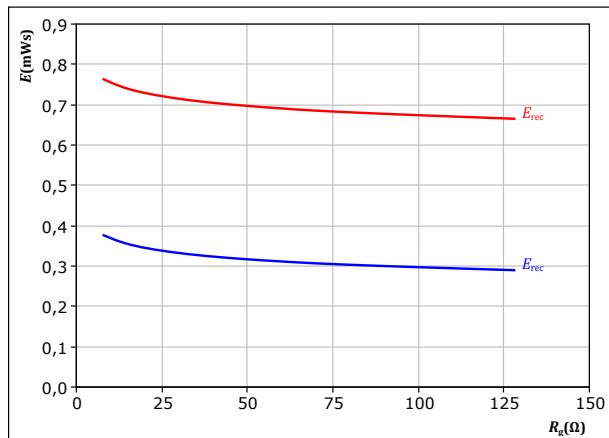
T_j : — 25 °C
— 150 °C

figure 12.

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

$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_C = 8$ A

T_j : — 25 °C
— 150 °C



Vincotech

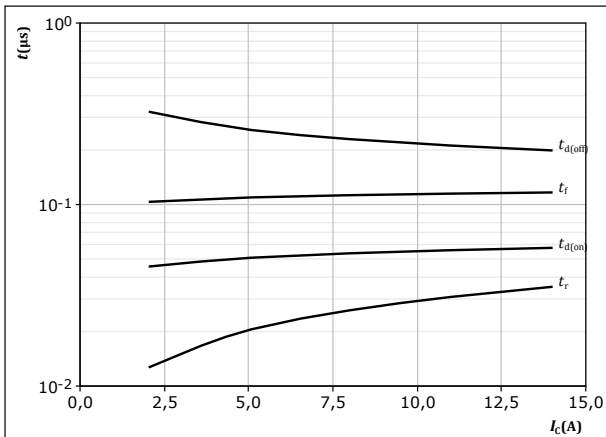
10-RZ126PA008SC-M627F41
datasheet

Inverter Switching Characteristics

figure 13.

IGBT

Typical switching times as a function of collector current
 $t = f(I_C)$



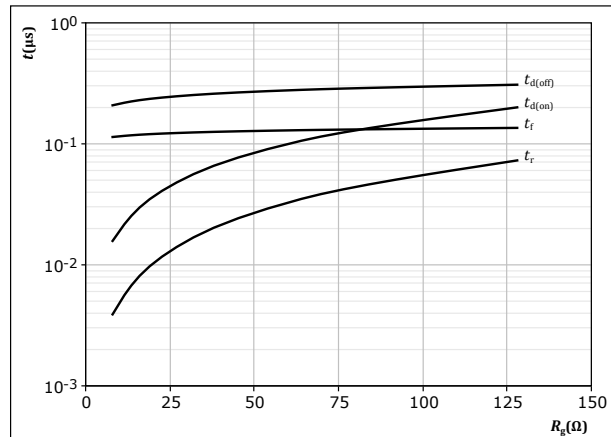
With an inductive load at

$T_j = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω
 $R_{goff} = 32$ Ω

figure 14.

IGBT

Typical switching times as a function of IGBT turn on gate resistor
 $t = f(R_g)$



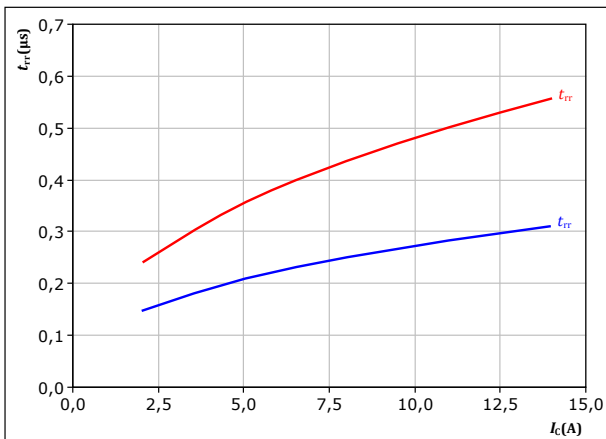
With an inductive load at

$T_j = 150$ °C
 $V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $I_C = 8$ A

figure 15.

FWD

Typical reverse recovery time as a function of collector current
 $t_{rr} = f(I_C)$



With an inductive load at

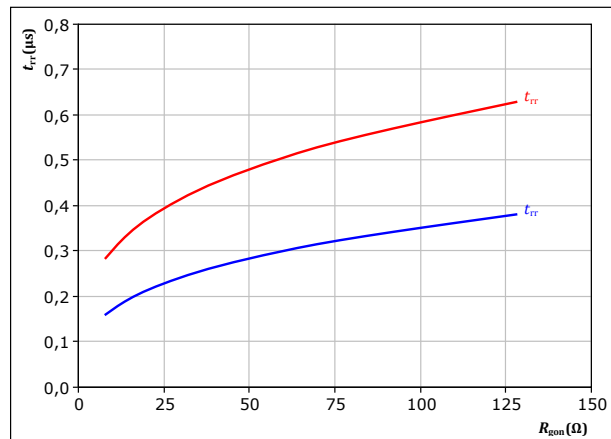
$V_{CE} = 600$ V
 $V_{GE} = \pm 15$ V
 $R_{gon} = 32$ Ω

T_j : — 25 °C
— 150 °C

figure 16.

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
 $I_C = 8$ A

T_j : — 25 °C
— 150 °C



Vincotech

10-RZ126PA008SC-M627F41
datasheet

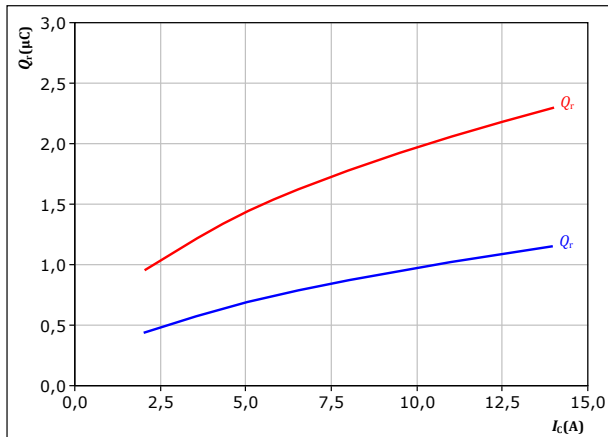
Inverter Switching Characteristics

figure 17.

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
 $R_{gon} = 32$ Ω

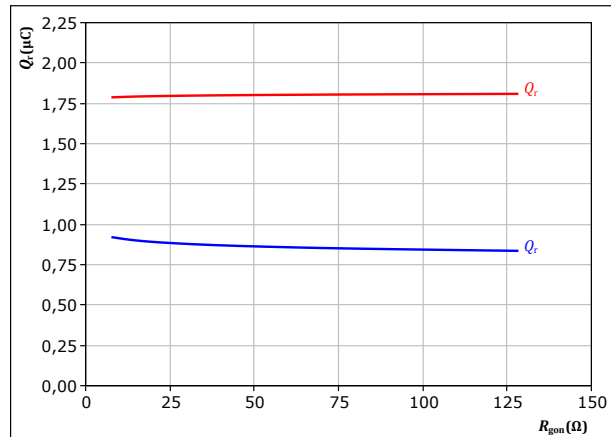
T_j : — 25 °C
— 150 °C

figure 18.

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
 $I_c = 8$ A

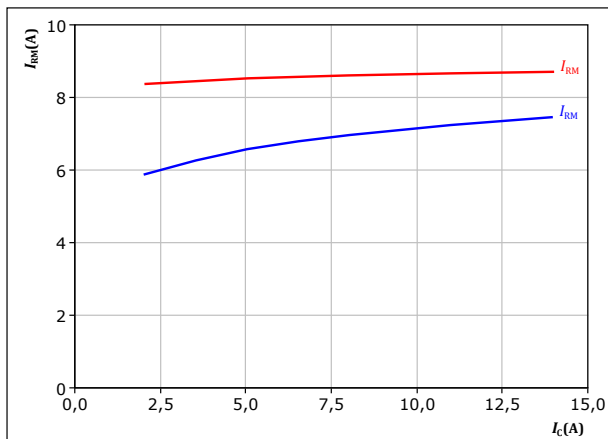
T_j : — 25 °C
— 150 °C

figure 19.

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
 $R_{gon} = 32$ Ω

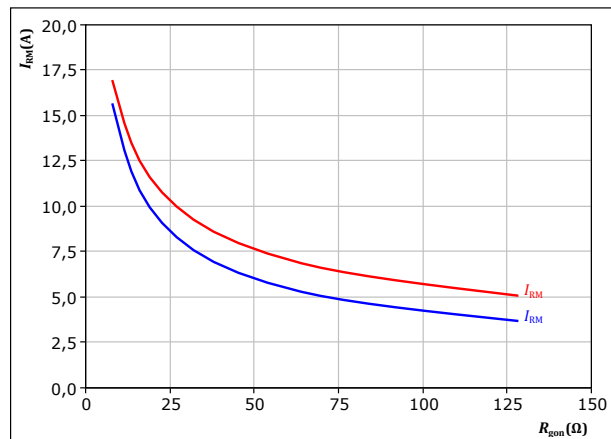
T_j : — 25 °C
— 150 °C

figure 20.

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
 $I_c = 8$ A

T_j : — 25 °C
— 150 °C



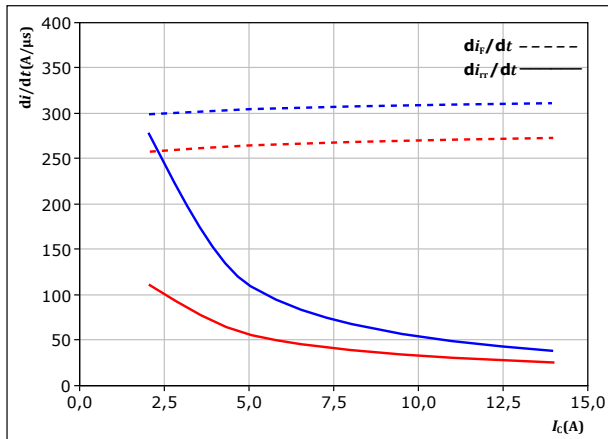
Vincotech

10-RZ126PA008SC-M627F41
datasheet

Inverter Switching Characteristics

figure 21. FWD

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



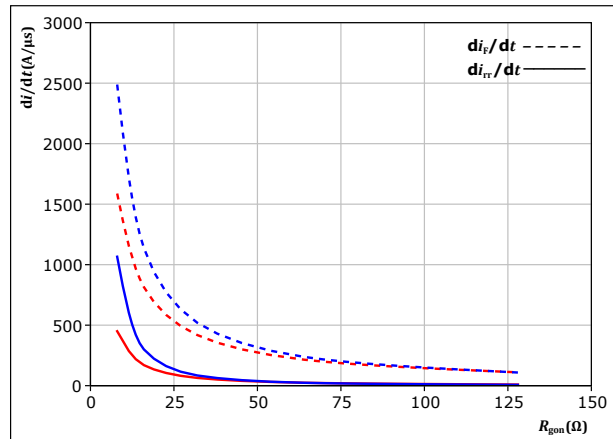
With an inductive load at

$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $R_{gon} = 32 \text{ } \Omega$

T_j : — 25 °C
— 150 °C

figure 22. 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

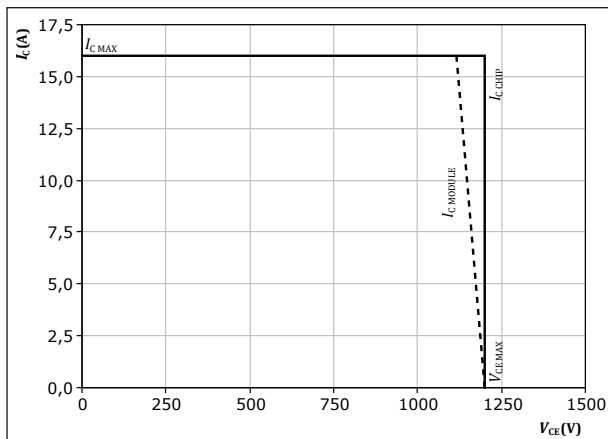
$V_{CE} = 600 \text{ V}$
 $V_{GE} = \pm 15 \text{ V}$
 $I_C = 8 \text{ A}$

T_j : — 25 °C
— 150 °C

figure 23. IGBT

Reverse bias safe operating area

$I_C = f(V_{CE})$



At $T_j = 150 \text{ } ^\circ\text{C}$
 $R_{gon} = 32 \text{ } \Omega$
 $R_{goff} = 32 \text{ } \Omega$



Vincotech

Inverter Switching Definitions

figure 24. IGBT

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

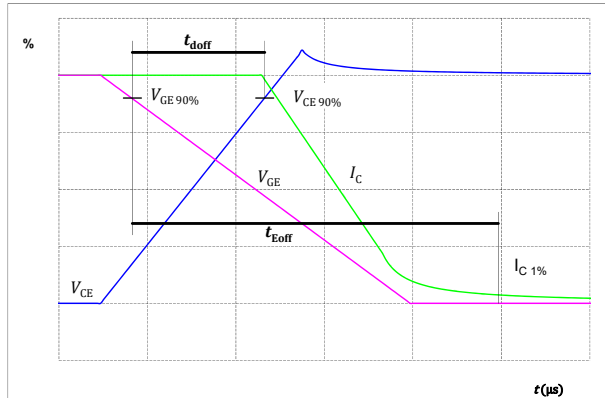


figure 25. IGBT

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

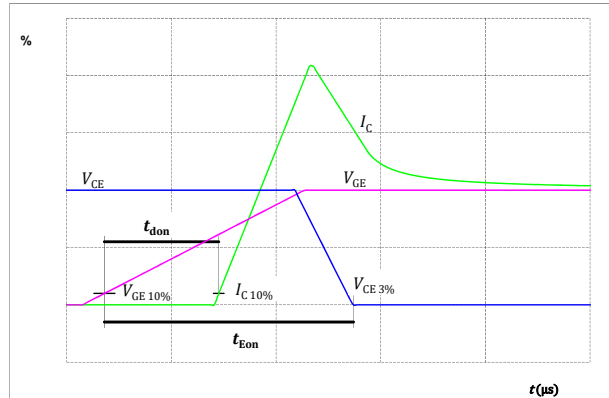


figure 26. IGBT

Turn-off Switching Waveforms & definition of t_f

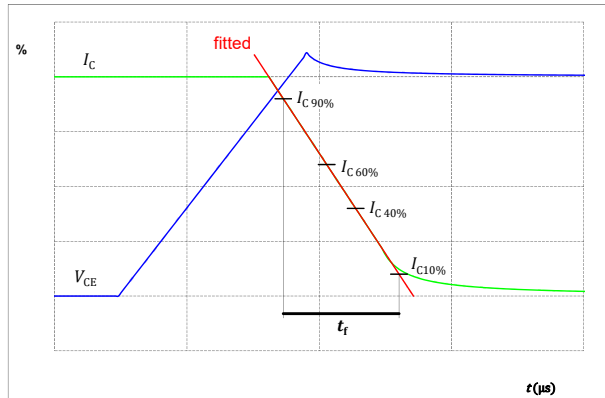
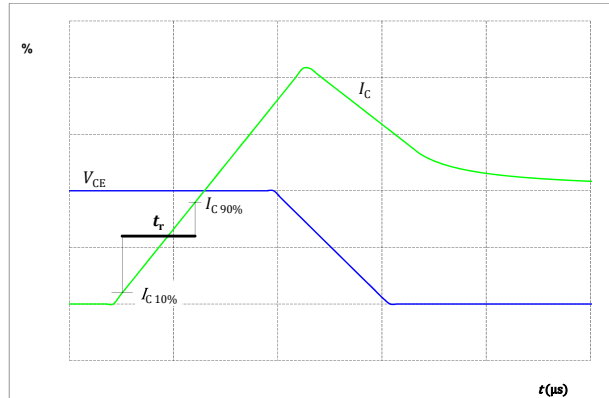


figure 27. IGBT

Turn-on Switching Waveforms & definition of t_r





Vincotech

Inverter Switching Definitions

figure 28.

FWD

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

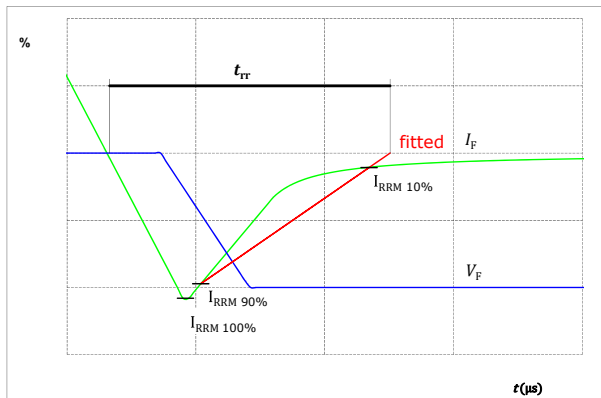
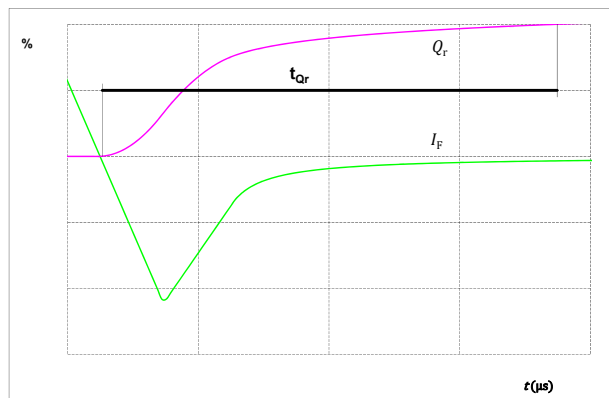


figure 29.

FWD

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





Vincotech

10-RZ126PA008SC-M627F41

datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	10-RZ126PA008SC-M627F41
With thermal paste (3,4 W/mK, PSX-P7)	10-RZ126PA008SC-M627F41-/3/

Marking						
	Text	Name	Date code	UL & VIN	Lot	Serial
		NN-NNNNNNNNNNNNNNNN- TTTTIV	WWYY	UL VIN	LLLL	SSSS
	Datamatrix	Type&Ver TTTTTIV	Lot number LLLLL	Serial SSSS	Date code WWYY	

Outline

Pin table [mm]

Pin	X	Y	Function
1	33,6	0	+UB
2	19,85	0	GWL
3	15,95	0	E6
4	12,95	0	E5
5	9,95	0	GVL
6	6,95	0	NTC1
7	3,95	0	GUL
8	0	0	E4
9	0	7	U
10	3	7	GUH
11	10	7	NTC2
12	19,3	7	V
13	22,3	7	GVH
14	28,5	7	W
15	31,5	7	GWH

The image shows two views of a 15-pin connector. The top view is a plan view showing the 15 pins arranged in two rows of 8 and 7 pins. The pins are numbered 1 to 15. The dimensions shown are 11.2 mm for the height of the top row of pins and 16.8 mm for the width of the top row of pins. The bottom view is a perspective view showing the connector housing and the pins. The dimensions shown are 19.32 ±0.5 mm for the height of the connector housing and 1 ±0.05 mm for the width of the pins.

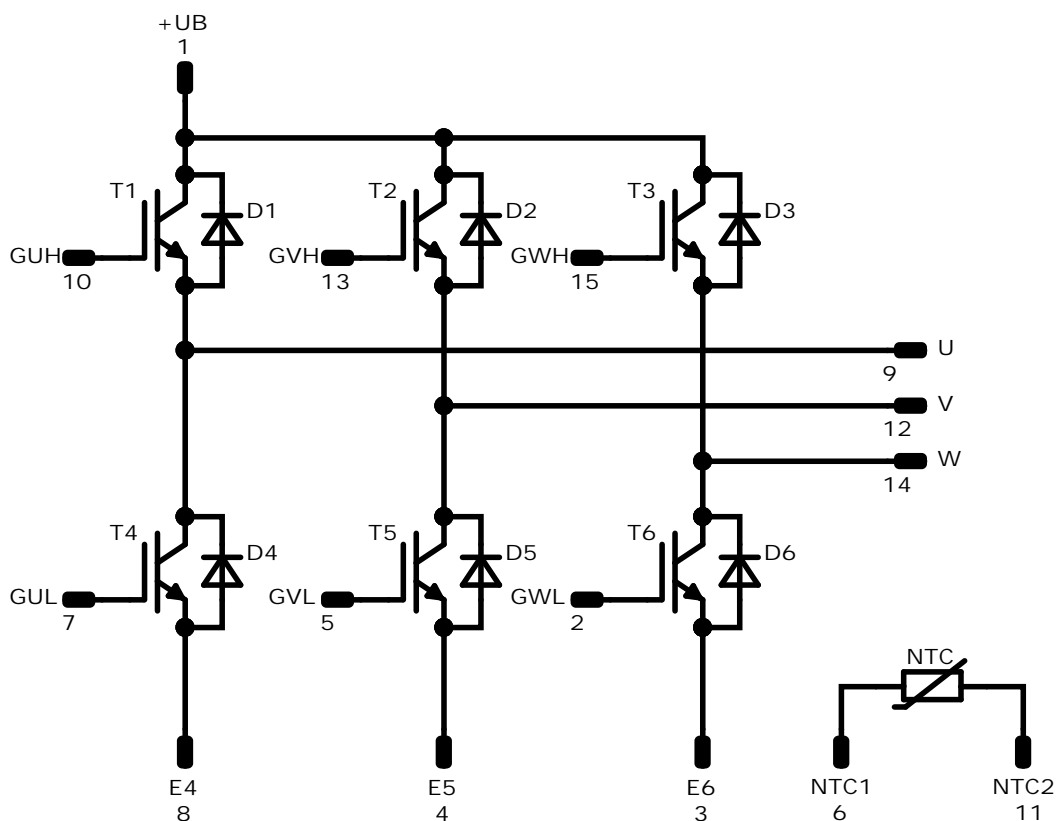
Tolerance of pinpositions: ±0.5mm at the end of pins
Dimension of coordinate axis is only offset without tolerance



Vincotech

10-RZ126PA008SC-M627F41
datasheet

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T4, T1, T5, T2, T6, T3	IGBT	1200 V	8 A	Inverter Switch	
D1, D4, D2, D5, D3, D6	FWD	1200 V	10 A	Inverter Diode	
NTC	Thermistor			Thermistor	



Vincotech

10-RZ126PA008SC-M627F41
datasheet

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

Handling instruction
Handling instructions for <i>flow90 0</i> packages see vincotech.com website.

Package data
Package data for <i>flow90 0</i> 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-RZ126PA008SC-M627F41-D3-14	4 May. 2022	New Datasheet format, module is unchanged	

DISCLAIMER

The information, specifications, procedures, methods and recommendations herein (together "information") are presented by Vincotech to reader in good faith, are believed to be accurate and reliable, but may well be incomplete and/or not applicable to all conditions or situations that may exist or occur. Vincotech reserves the right to make any changes without further notice to any products to improve reliability, function or design. No representation, guarantee or warranty is made to reader as to the accuracy, reliability or completeness of said information or that the application or use of any of the same will avoid hazards, accidents, losses, damages or injury of any kind to persons or property or that the same will not infringe third parties rights or give desired results. It is reader's sole responsibility to test and determine the suitability of the information and the product for reader's intended use.

LIFE SUPPORT POLICY

Vincotech products are not authorised for use as critical components in life support devices or systems without the express written approval of Vincotech.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in labelling can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.