



Vincotech

10-EY232PB008ME01-PN97F08T

datasheet

flowDUAL E2 SiC

2300 V / 8 mΩ

Topology features

- Half Bridge
- Temperature sensor

Component features

- Fast intrinsic diode with low reverse recovery
- High blocking voltage with low on-resistance
- High speed switching with low capacitance

Housing features

- Base isolation: AlN
- Convex shaped substrate for superior thermal contact
- Compact housing
- CTI600 housing material
- Thermo-mechanical push-and-pull force relief
- Press-fit pin
- Reliable cold welding connection

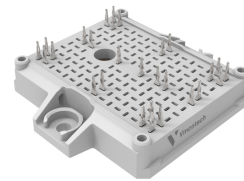
Target applications

- Charging Stations
- Energy Storage Systems
- General
- Industrial Drives
- Power Supply
- UPS
- Welding & Cutting

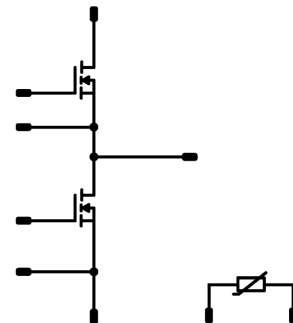
Types

- 10-EY232PB008ME01-PN97F08T

flow E2 12 mm housing



Schematic





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Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
Inverter Switch				
Drain-source voltage	V_{DS}		2300	V
Drain current (DC current)	I_D	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	157	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	664	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	499	W
Gate-source voltage	V_{GS}	static	-4 / 15	V
		dynamic	-8 / 19	V
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* $t_p = 2\text{ s}$	6800	V
Creepage distance			>12,7	mm
Clearance			9,05	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

Drain-source on-state resistance	$r_{DS(on)}$		15		276	25 125 150		8,2 16 19,1	9,75 ⁽¹⁾	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$			0,076	25	1,8	2,5	3,6	V
Gate to Source Leakage Current	I_{GSS}		15	0		25		40	400	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	2300		25		4	40	μA
Internal gate resistance	r_g							2,5		Ω
Gate charge	Q_g		-4/15	1500	276	25		588		nC
Short-circuit input capacitance	C_{iss}	$f = 100$ kHz	0	1500	0	25		24000		pF
Short-circuit output capacitance	C_{oss}							408		
Reverse transfer capacitance	C_{rss}							40		
Diode forward voltage	V_{SD}		0		140	25		5,5		V

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,19		K/W
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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	
Dynamic										
Turn-on delay time	$t_{d(on)}$	$R_{gon} = 1\ \Omega$ $R_{goff} = 1\ \Omega$	-4/15	1500	280	25 125 150		34,01 30,83 30,59		ns
Rise time	t_r					25 125 150		26,78 25,23 24,73		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		170,43 192,06 198,46		ns
Fall time	t_f					25 125 150		14,99 16,45 17,11		ns
Turn-on energy (per pulse)	E_{on}					25 125 150		17,03 19,77 27,32		mWs
Turn-off energy (per pulse)	E_{off}	25 125 150					11,65 12,7 13,09		mWs	
Peak recovery current	I_{RRM}	$di/dt=14286\ A/\mu s$ $di/dt=12701\ A/\mu s$ $di/dt=14015\ A/\mu s$				25 125 150		153,71 174,66 190,27		A
Reverse recovery time	t_{rr}					25 125 150		22,49 168,32 190,46		ns
Recovered charge	Q_r					25 125 150		1,98 5,84 8,8		μC
Reverse recovered energy	E_{rec}					25 125 150		0,984 5,54 8,77		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		17651,33 9117,75 2369,28		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		5		kΩ
Deviation of R100	$\Delta_{R/R}$	$R_{100} = 499 \Omega$				100	3,2		3,3	%
Power dissipation	P					25		130		mW
Power dissipation constant	d					25		1,3		mW/K
B-value	$B_{(25/50)}$	Tol. $\pm 1 \%$						3380		K
Vincotech Thermistor Reference									V	

⁽¹⁾ Value at chip level

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



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Inverter Switch Characteristics

figure 1. MOSFET

Typical output characteristics

$$I_D = f(V_{DS})$$

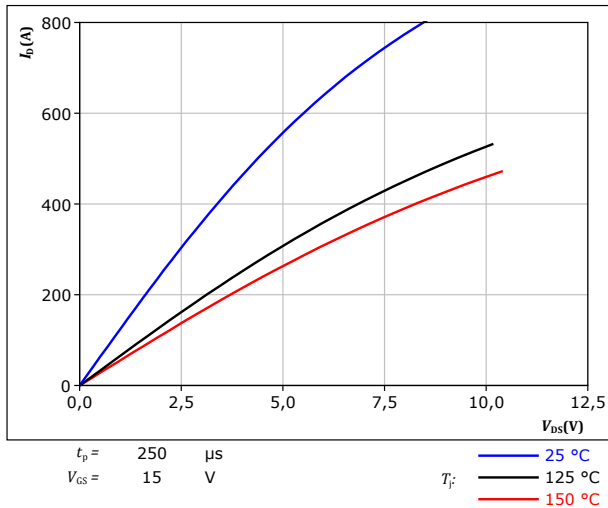


figure 2. MOSFET

Typical output characteristics

$$I_D = f(V_{DS})$$

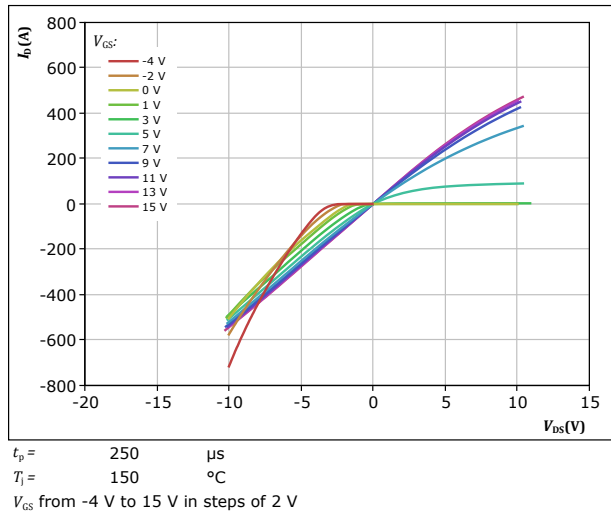


figure 3. MOSFET

Typical transfer characteristics

$$I_D = f(V_{GS})$$

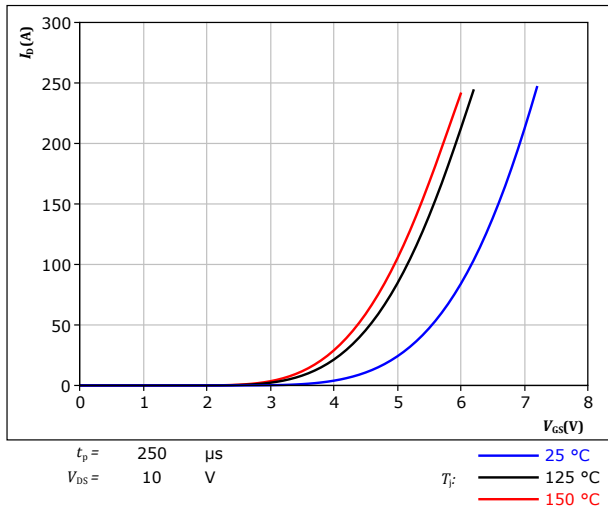
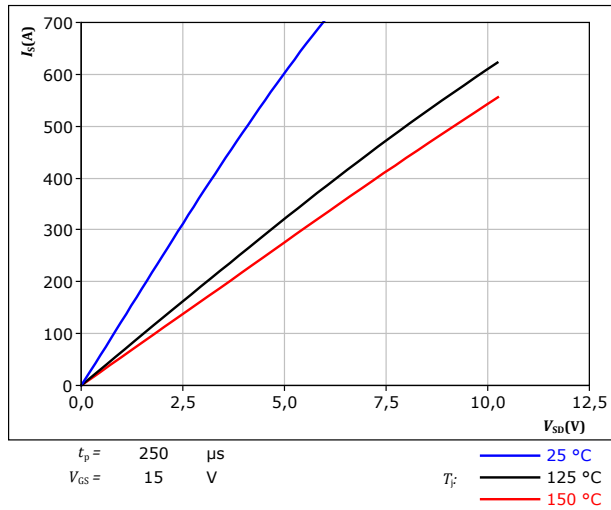


figure 4. MOSFET

Typical reverse drain current characteristics

$$I_{SD} = f(V_{SD})$$





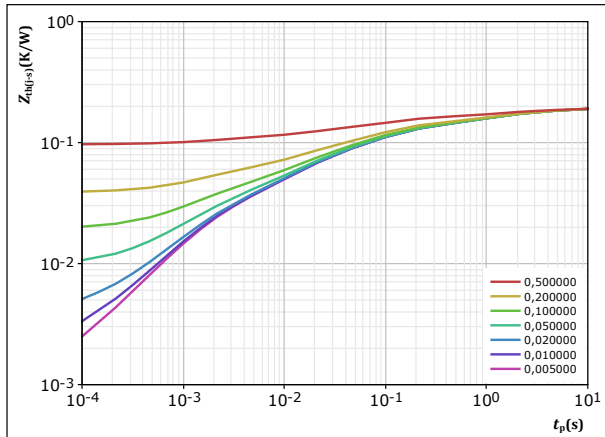
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Inverter Switch Characteristics

figure 5. MOSFET

Transient thermal impedance as a function of pulse width

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



$$D = t_p / T$$

$$R_{th(j-a)} = 0,19 \text{ K/W}$$

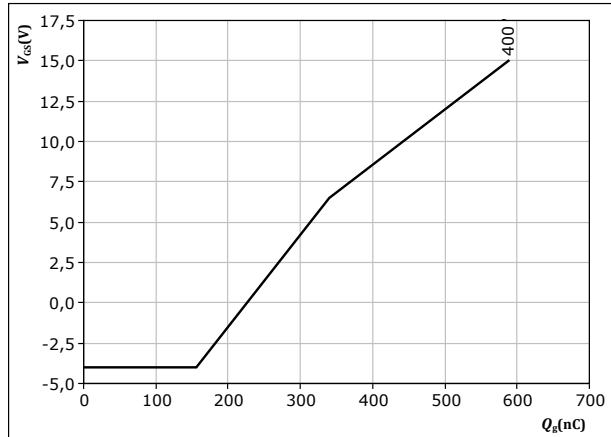
MOSFET thermal model values

R (K/W)	τ (s)
2,58E-02	4,66E+00
4,25E-02	8,61E-01
6,53E-02	7,99E-02
3,83E-02	1,32E-02
2,11E-02	1,44E-03

figure 6. MOSFET

Gate voltage vs gate charge

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



$$I_D = 200 \text{ A}$$

$$T_j = 25 \text{ }^{\circ}\text{C}$$



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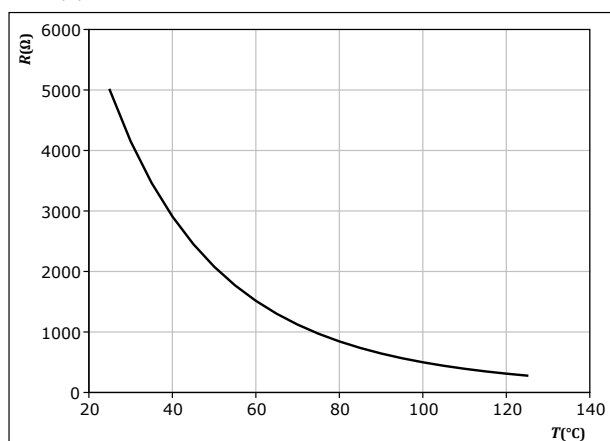
Thermistor Characteristics

figure 7.

Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$





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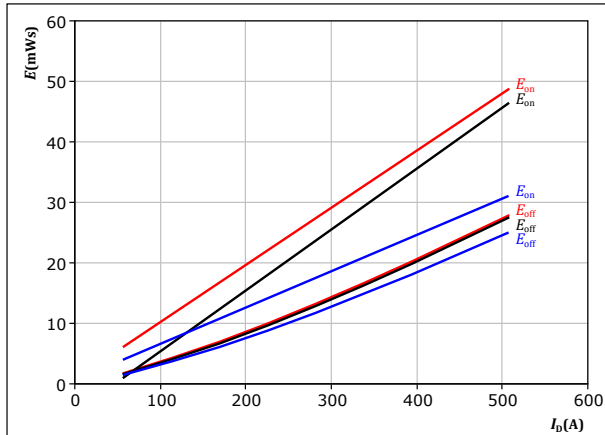
Inverter Switching Characteristics

figure 8.

MOSFET

Typical switching energy losses as a function of drain current

$$E = f(I_D)$$



With an inductive load at

$V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $R_{gon} = 1$ Ω
 $R_{goff} = 1$ Ω

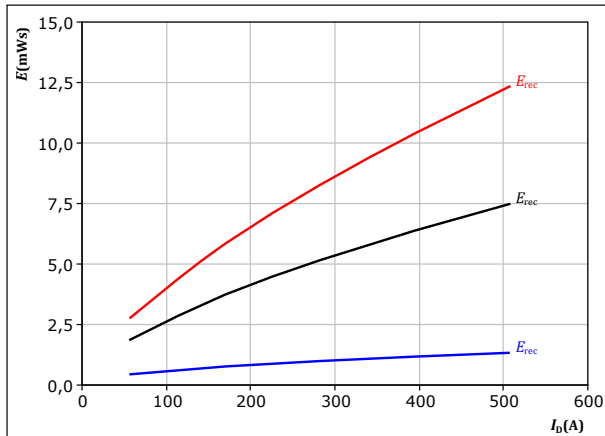
T_j : 25 °C
125 °C
150 °C

figure 10.

MOSFET

Typical reverse recovered energy loss as a function of drain current

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



With an inductive load at

$V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $R_{gon} = 1$ Ω

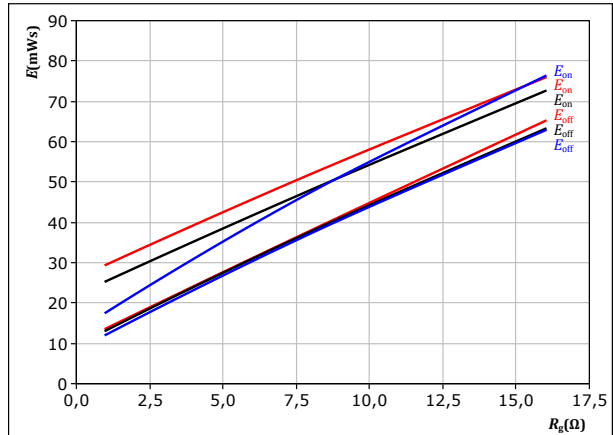
T_j : 25 °C
125 °C
150 °C

figure 9.

MOSFET

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

$$E = f(R_g)$$



With an inductive load at

$V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $I_D = 280$ A

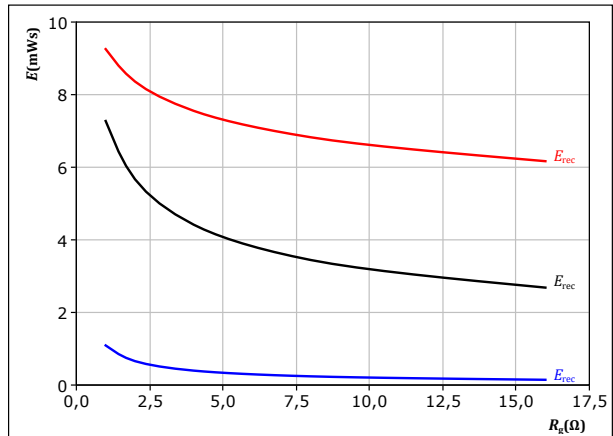
T_j : 25 °C
125 °C
150 °C

figure 11.

MOSFET

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

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



With an inductive load at

$V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $I_D = 280$ A

T_j : 25 °C
125 °C
150 °C



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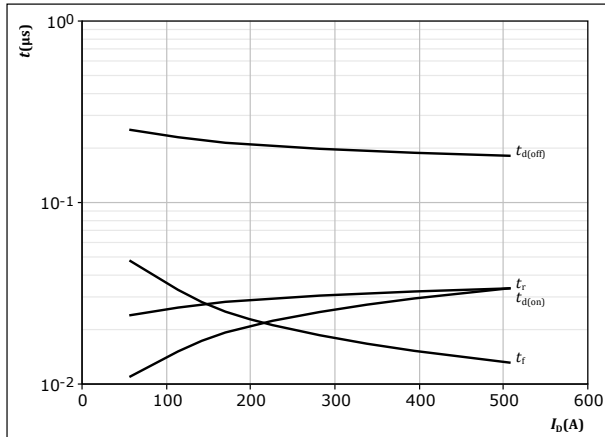
10-EY232PB008ME01-PN97F08T datasheet

Inverter Switching Characteristics

figure 12.

MOSFET

Typical switching times as a function of drain current
 $t = f(I_D)$



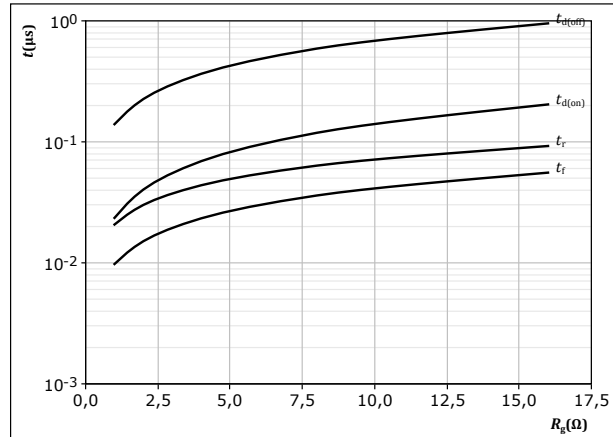
With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $R_{gon} = 1$ Ω
 $R_{goff} = 1$ Ω

figure 13.

MOSFET

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



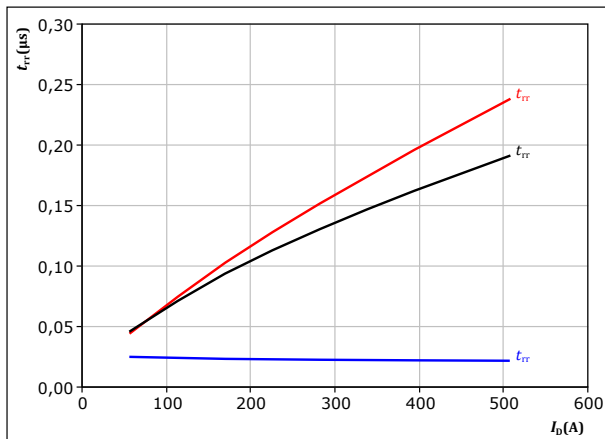
With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $I_D = 280$ A

figure 14.

MOSFET

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

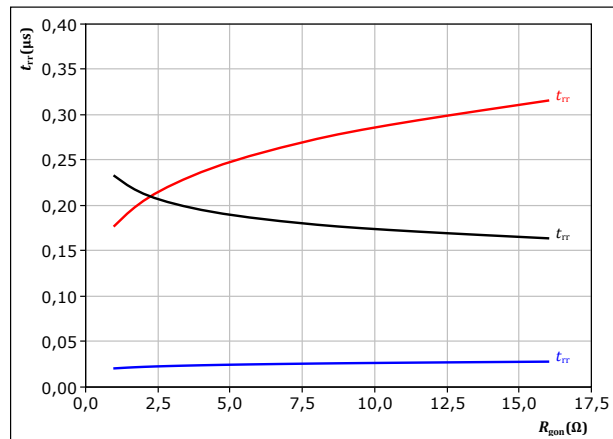


At $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $R_{gon} = 1$ Ω
 $T_j: 25$ °C
 125 °C
 150 °C

figure 15.

MOSFET

Typical reverse recovery time as a function of MOSFET turn on gate resistor
 $t_{rr} = f(R_{gon})$



At $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $I_D = 280$ A
 $T_j: 25$ °C
 125 °C
 150 °C



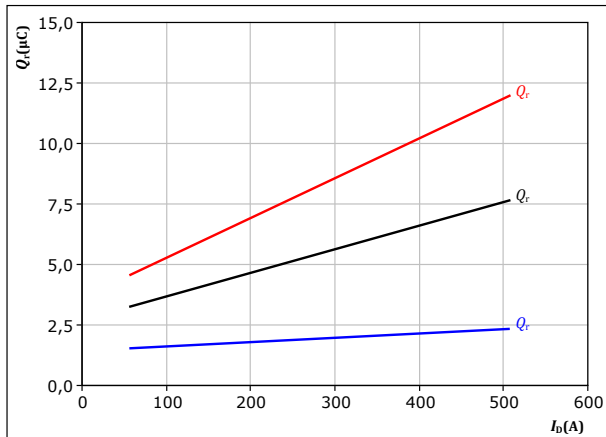
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Inverter Switching Characteristics

figure 16. MOSFET

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$

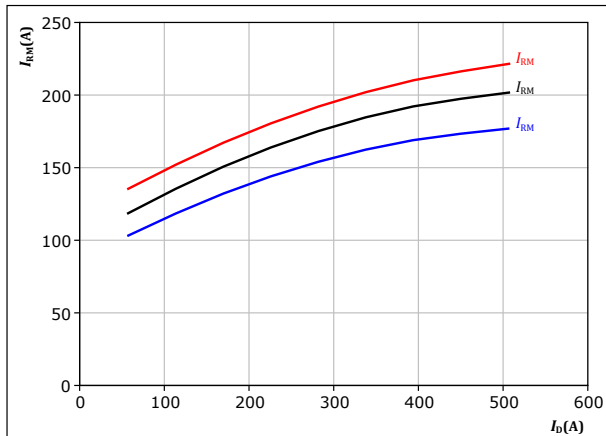


At $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $R_{gon} = 1$ Ω
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 18. MOSFET

Typical peak reverse recovery current as a function of drain current

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

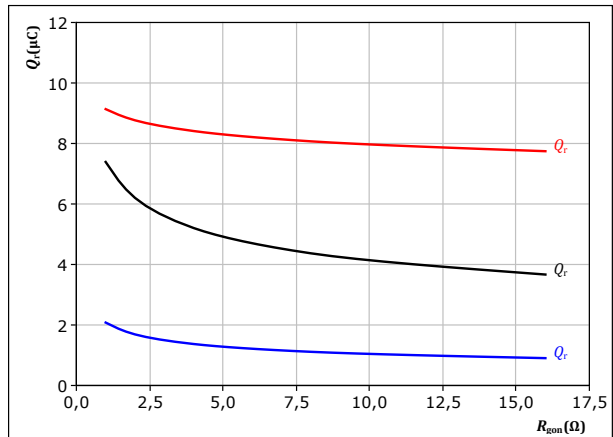


At $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $R_{gon} = 1$ Ω
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 17. MOSFET

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

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

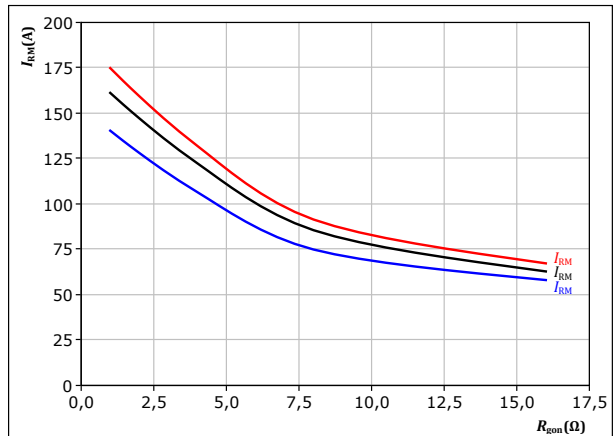


At $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $I_D = 280$ A
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 19. MOSFET

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

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



At $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $I_D = 280$ A
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

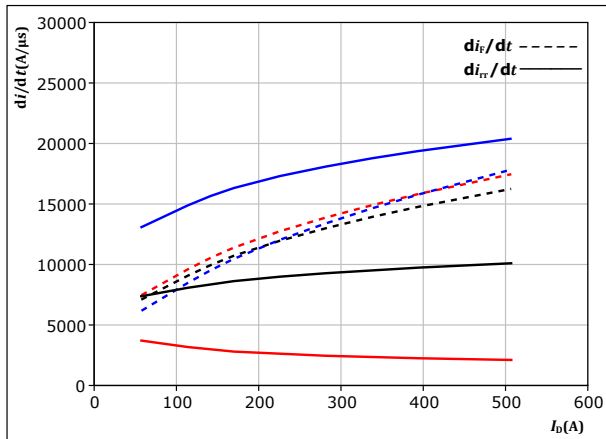


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Inverter Switching Characteristics

figure 20. MOSFET

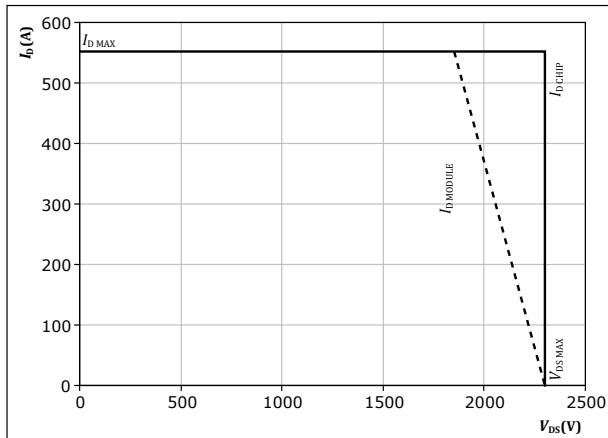
Typical rate of fall of forward and reverse recovery current as a function of drain current
 $di_f/dt, di_r/dt = f(I_D)$



At $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $R_{gon} = 1$ Ω
 $T_j = 25$ °C
 $T_j = 125$ °C
 $T_j = 150$ °C

figure 22. MOSFET

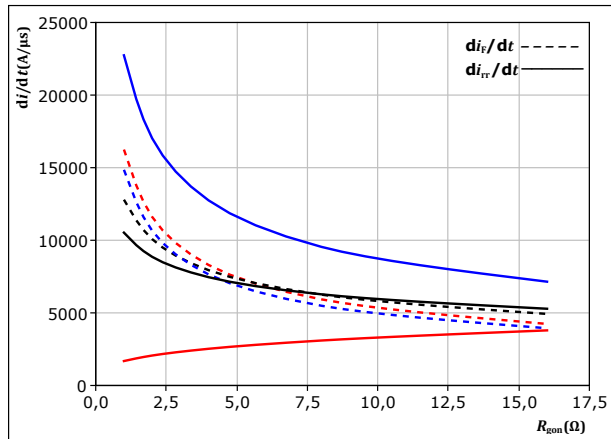
Reverse bias safe operating area
 $I_D = f(V_{DS})$



At $T_j = 150$ °C
 $R_{gon} = 1$ Ω
 $R_{goff} = 1$ Ω

figure 21. MOSFET

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



At $V_{DS} = 1500$ V
 $V_{GS} = -4/15$ V
 $I_D = 280$ A
 $T_j = 25$ °C
 $T_j = 125$ °C
 $T_j = 150$ °C



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Inverter Switching Definitions

figure 23. MOSFET

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

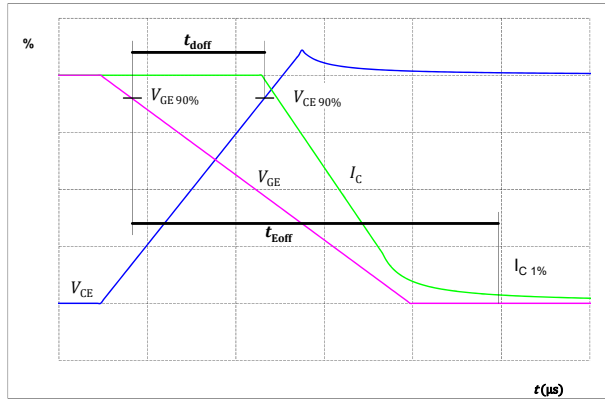


figure 24. MOSFET

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

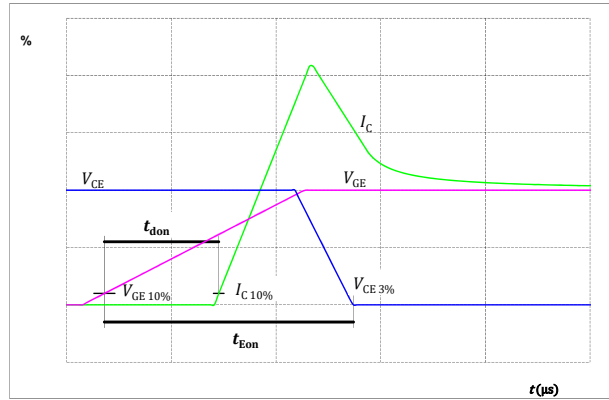


figure 25. MOSFET

Turn-off Switching Waveforms & definition of t_f

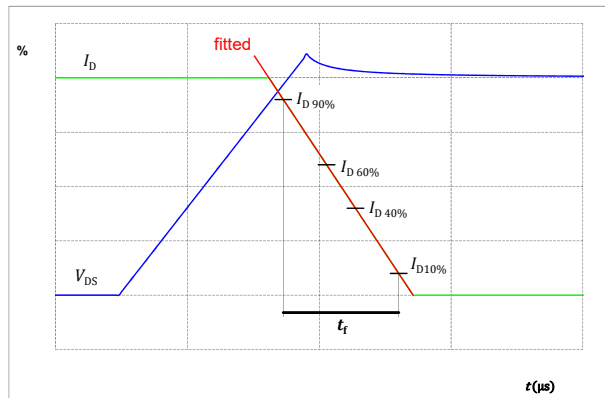
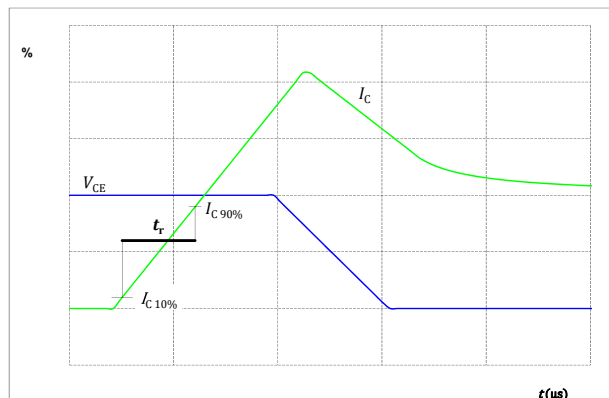


figure 26. MOSFET

Turn-on Switching Waveforms & definition of t_r





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Inverter Switching Definitions

figure 27. FWD

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

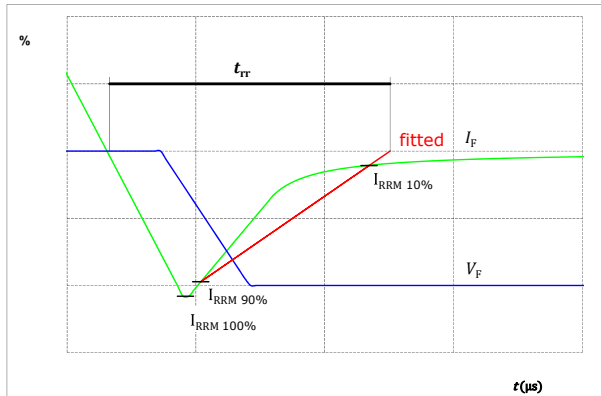


figure 28. FWD

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

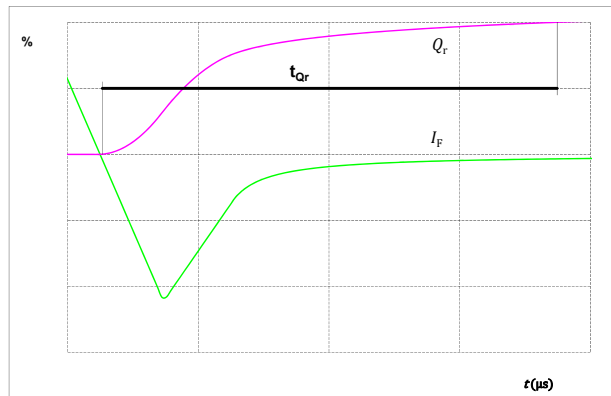
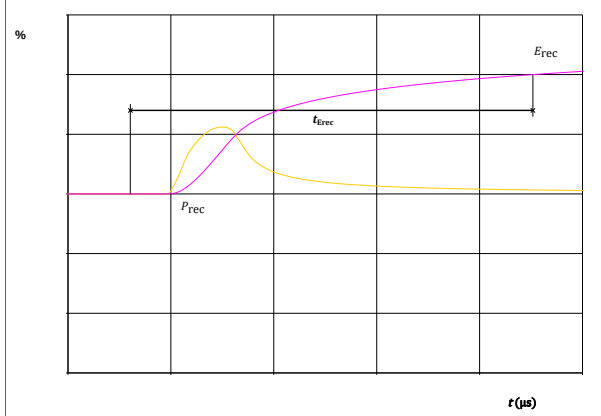


figure 29. FWD

Turn-on Switching Waveforms & definition of t_{Erec} (t_{Erec} = integrating time for E_{rec})





datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	10-EY232PB008ME01-PN97F08T
With thermal paste (5,2 W/mK, PTM6000HV)	10-EY232PB008ME01-PN97F08T-/7/

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

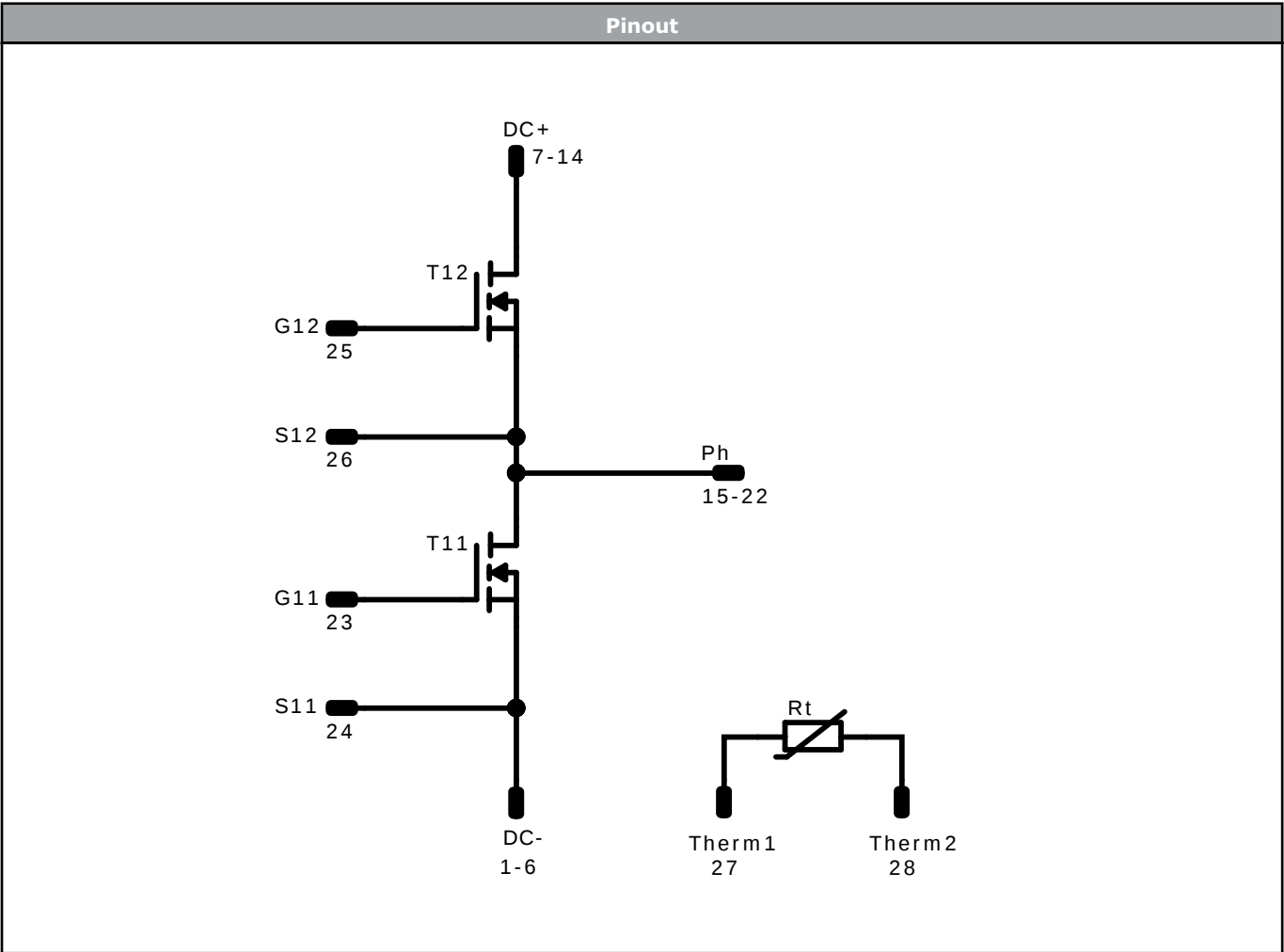
Pin table [mm]			
Pin	X	Y	Function
1	16	9,6	DC-
2	16	12,8	DC-
3	16	19,2	DC-
4	16	28,8	DC-
5	16	41,6	DC-
6	16	44,8	DC-
7	32	44,8	DC+
8	32	48	DC+
9	28,8	44,8	DC+
10	28,8	48	DC+
11	32	0	DC+
12	32	3,2	DC+
13	28,8	0	DC+
14	28,8	3,2	DC+
15	0	0	Ph
16	0	3,2	Ph
17	3,2	0	Ph
18	3,2	3,2	Ph
19	0	44,8	Ph
20	0	48	Ph
21	3,2	44,8	Ph
22	3,2	48	Ph
23	0	22,4	G11
24	3,2	22,4	S11
25	32	22,4	G12
26	28,8	22,4	S12
27	19,2	0	Therm1
28	16	0	Therm2

center of press-fit pin head
pin head type "T": P/B plated through-hole Ø1mm ±0.09 / -0.06
for further FEB design rules refer to the latest handling instruction

Tolerance of positions: ±0.4mm at the end of pins
Dimension of coordinate axis is only offset without tolerance



Vincotech



Identification					
ID	Component	Voltage	Current	Function	Comment
T11, T12	MOSFET	2300 V	7,5 mΩ	Inverter Switch	
Rt	Thermistor			Thermistor	



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datasheet

Packaging instruction				
Standard packaging quantity (SPQ) 100	>SPQ	Standard	<SPQ	Sample
Handling instruction				
Handling instructions for <i>flow</i> E2 packages see vincotech.com website.				
Package data				
Package data for <i>flow</i> E2 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 $T_{j,sp}=175^{\circ}\text{C}$ and up to 4000VAC/1min isolation voltage. For more information see vincotech.com website.				

Document No.:	Date:	Modification:	Pages
10-EY232PB008ME01-PN97F08T-D1-14	19 May. 2025	Initial Release	

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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.