Vincotech

10-EY232PB005ME01-PN99F08T
datasheet

flowDUAL E2 SiC **2300 V / 5 mΩ**

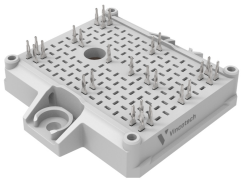
Topology features
- Temperature sensor
- Half Bridge

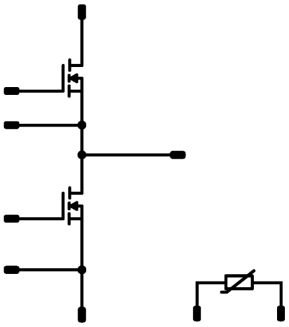
Component features
- Fast intrinsic diode with low reverse recovery
- High blocking voltage with low on-resistance
- High speed switching with low capacitance

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-EY232PB005ME01-PN99F08T

flow E2 12 mm housing


Schematic


Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Half-Bridge Switch				
Drain-source voltage	V_{DSS}		2300	V
Drain current (DC current)	I_D	T_j = T_{jmax} T_s = 80 °C	220	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	996	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	676	W
Gate-source voltage	V_{GSS}	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 s	6800	V
Creepage distance			>12,7	mm
Clearance			9,05	mm
Comparative Tracking Index	CTI		≥ 600	

*100 % tested in production

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	
Half-Bridge Switch										
Static										
Drain-source on-state resistance(1)	$r_{DS(on)}$		15		414	25 175		5 14,5	6,5	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$			0,114	25	1,8	2,5	3,6	V
Gate to Source Leakage Current	I_{GSS}		15	0		25		60	600	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	2300		25		6	60	µA
Internal gate resistance	r_g							1		Ω
Gate charge	Q_g		-4/15	1500	414	25		882		nC
Short-circuit input capacitance	C_{iss}	f = 100 kHz	0	1500	0	25		36000		pF
Short-circuit output capacitance	C_{oss}							612		
Reverse transfer capacitance	C_{rss}							60		
Diode forward voltage	V_{SD}		0		210	25		5,5		V
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,14		K/W

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} = 0,5 Ω R_{goff} = 0,5 Ω	-4/15	1200	420	25 125 150		31,08 29,59 29,23		ns
Rise time	t_r					25 125 150		20,04 18,16 17,96		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		130,5 146,58 150,93		ns
Fall time	t_f					25 125 150		16,85 18,4 18,41		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=3,74 µC Q_{rFWD}=8,55 µC Q_{rFWD}=13,5 µC				25 125 150		8,49 8,25 9,1		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		12,26 13 13,37		mWs
Peak recovery current	I_{RRM}	di/dt=26330 A/µs di/dt=27663 A/µs di/dt=26551 A/µs				25 125 150		252,83 333,67 419,3		A
Reverse recovery time	t_{rr}					25 125 150		24,79 41,6 51,51		ns
Recovered charge	Q_r					25 125 150		3,74 8,55 13,5		µC
Reverse recovered energy	E_{rec}					25 125 150		3,45 8,8 14,15		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		23214,9 17624,76 19392,74		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		5		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 499 Ω				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. ±1 %						3380		K
Vincotech Thermistor Reference									V	

(1) Value at chip level

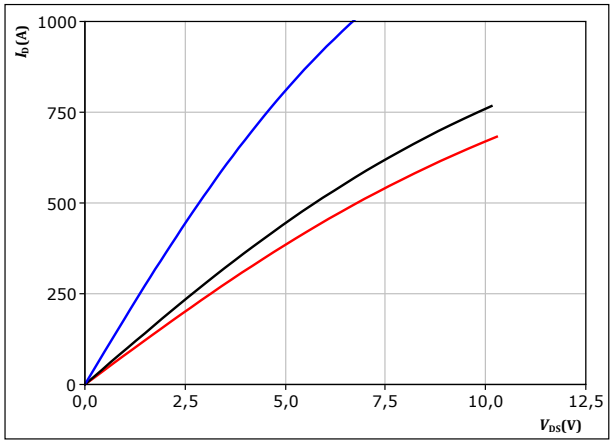
(2) Only valid with pre-applied Vincotech thermal interface material.

Half-Bridge Switch Characteristics

figure 1. **MOSFET**

Typical output characteristics including $R_{DD'} + R_{SS'}$

$I_D = f(V_{DS})$

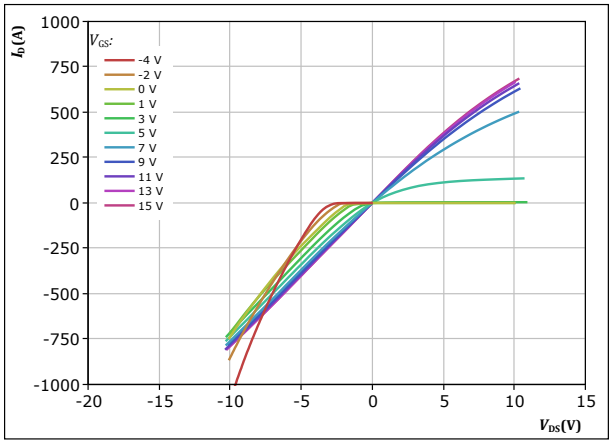


t_p =	250	µs		
V_{GS} =	15	V	T_j:	25 °C
				125 °C
				150 °C

figure 2. **MOSFET**

Typical output characteristics including $R_{DD'} + R_{SS'}$

$I_D = f(V_{DS})$



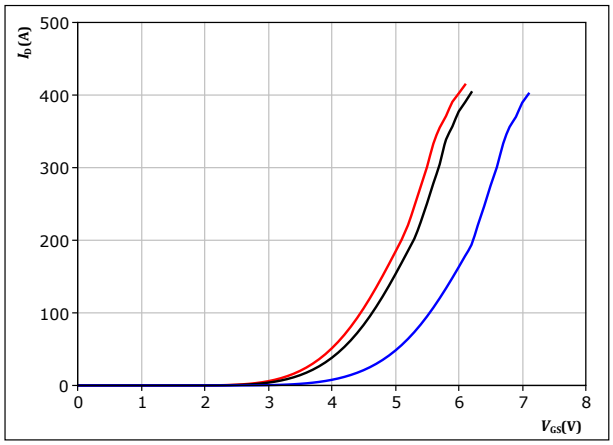
t_p =	250	µs
T_j =	150	°C

V_{GS} from -4 V to 15 V in steps of 2 V

figure 3. **MOSFET**

Typical transfer characteristics

$I_D = f(V_{GS})$

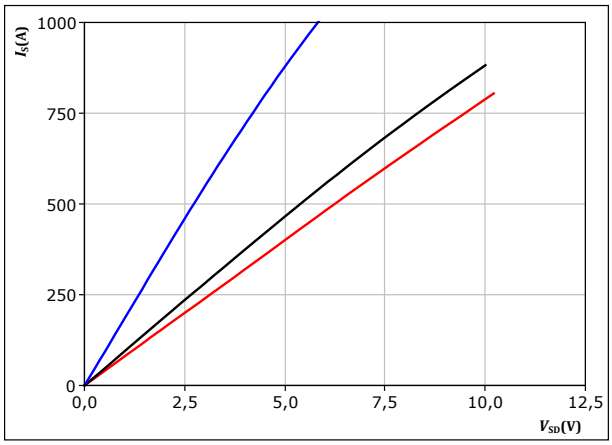


t_p =	250	µs		
V_{DS} =	42	V	T_j:	25 °C
				125 °C
				150 °C

figure 4. **MOSFET**

Typical reverse drain current characteristics including $R_{DD'} + R_{SS'}$

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



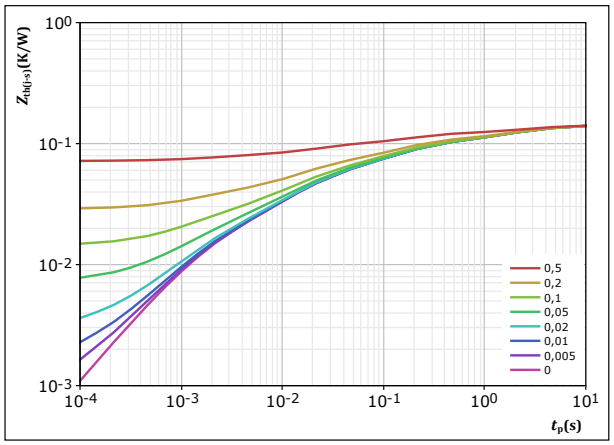
t_p =	250	µs		
V_{GS} =	15	V	T_j:	25 °C
				125 °C
				150 °C

Half-Bridge Switch Characteristics

figure 5. **MOSFET**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,141	K/W

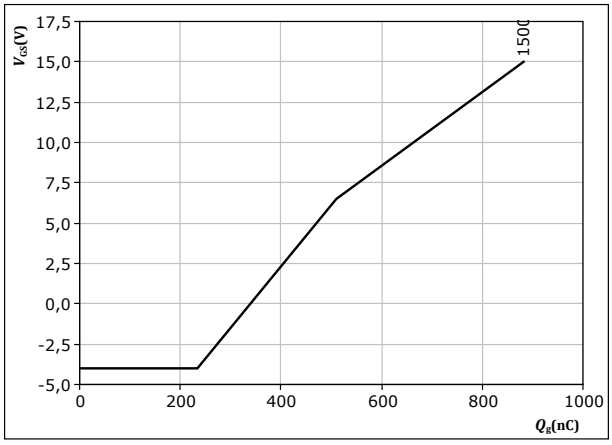
MOSFET thermal model values

R (K/W)	τ (s)
1,37E-02	7,18E+00
3,54E-02	1,56E+00
4,68E-02	1,29E-01
3,56E-02	1,47E-02
1,18E-02	1,40E-03

figure 6. **MOSFET**

Gate voltage vs gate charge

$V_{GS} = f(Q_g)$



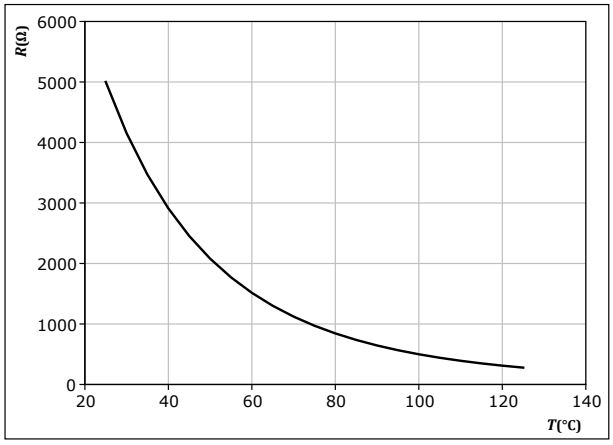
I_D =	300	A
T_j =	25	°C

Thermistor Characteristics

figure 7. **Thermistor**

Typical NTC characteristic as function of temperature

$R_T = f(T)$

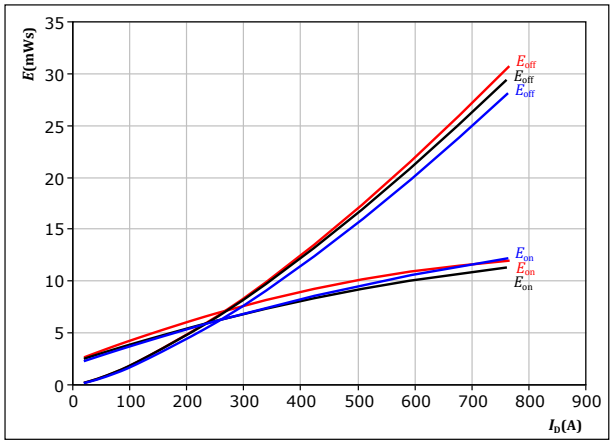


Half-Bridge Switching Characteristics

figure 8. **MOSFET**

Typical switching energy losses as a function of drain current

$E = f(I_D)$



With an inductive load at

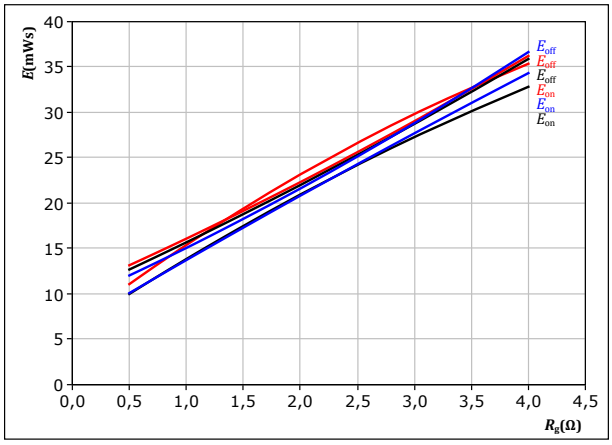
V_{DS} =	1200	V	
V_{GS} =	-4/15	V	
R_{gon} =	0,5	Ω	
R_{goff} =	0,5	Ω	

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

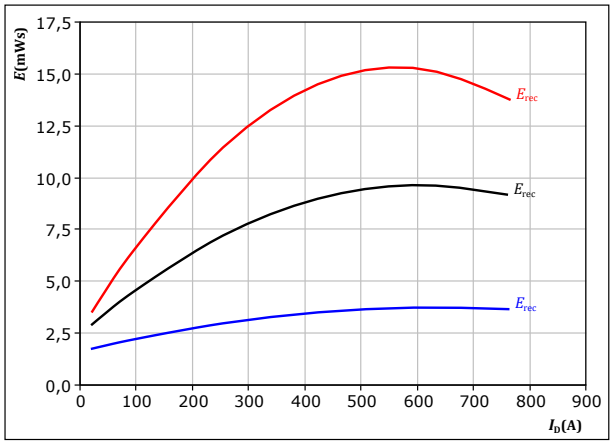
V_{DS} =	1200	V	
V_{GS} =	-4/15	V	
I_D =	420	A	

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

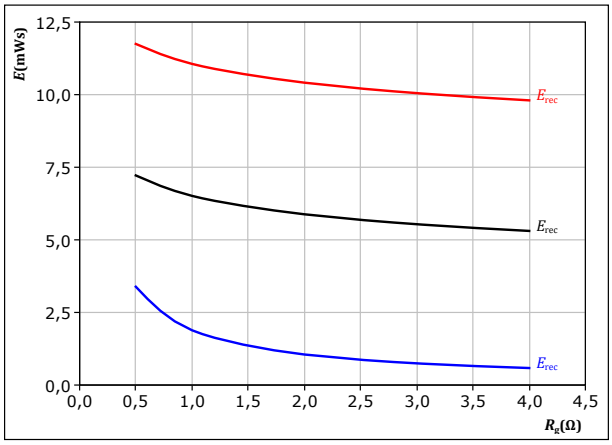
V_{DS} =	1200	V	
V_{GS} =	-4/15	V	
R_{gon} =	0,5	Ω	

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} =	1200	V	
V_{GS} =	-4/15	V	
I_D =	420	A	

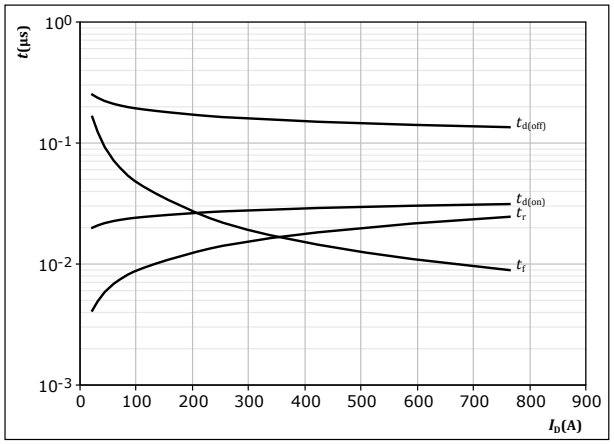
T_j: 25 °C, 125 °C, 150 °C

Half-Bridge Switching Characteristics

figure 12. **MOSFET**

Typical switching times as a function of drain current

$t = f(I_D)$



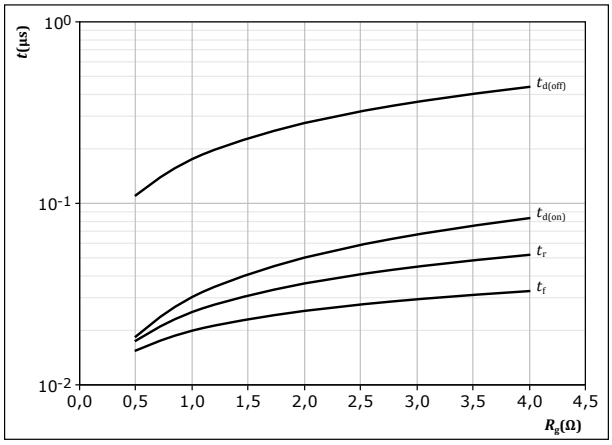
With an inductive load at

T_j =	150	°C
V_{DS} =	1200	V
V_{GS} =	-4/15	V
R_{gon} =	0,5	Ω
R_{goff} =	0,5	Ω

figure 13. **MOSFET**

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

$t = f(R_g)$



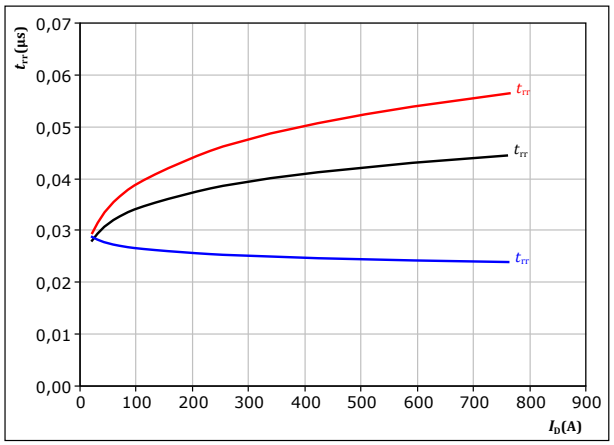
With an inductive load at

T_j =	150	°C
V_{DS} =	1200	V
V_{GS} =	-4/15	V
I_D =	420	A

figure 14. **MOSFET**

Typical reverse recovery time as a function of drain current

$t_{rr} = f(I_D)$



At

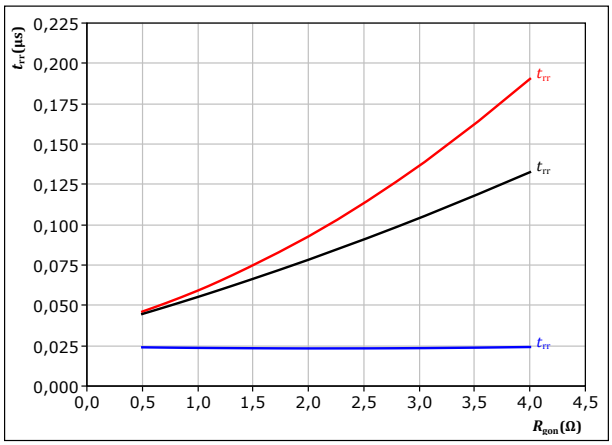
V_{DS} =	1200	V
V_{GS} =	-4/15	V
R_{gon} =	0,5	Ω

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} =	1200	V
V_{GS} =	-4/15	V
I_D =	420	A

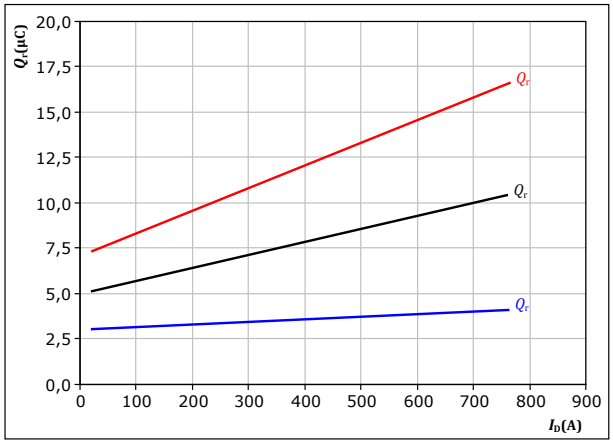
T_j: 25 °C, 125 °C, 150 °C

Half-Bridge Switching Characteristics

figure 16. **MOSFET**

Typical recovered charge as a function of drain current

$Q_r = f(I_D)$

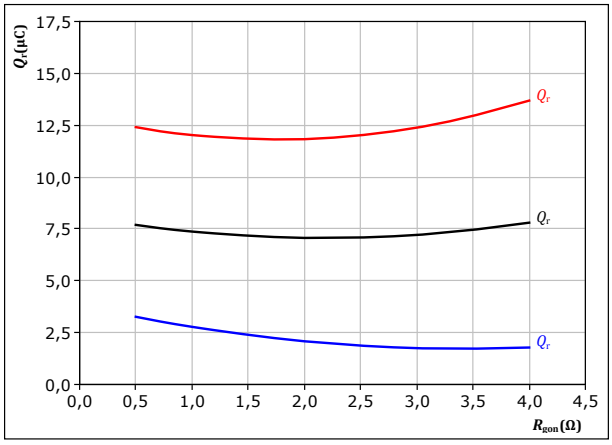


At					
	V_{DS} =	1200	V	T_j:	25 °C
	V_{GS} =	-4/15	V		125 °C
	R_{gon} =	0,5	Ω		150 °C

figure 17. **MOSFET**

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

$Q_r = f(R_{gon})$

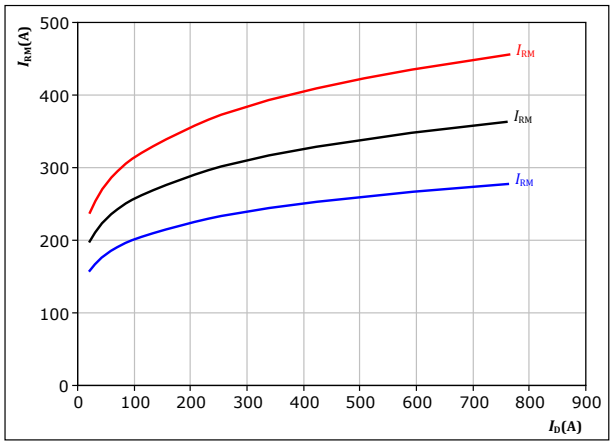


At					
	V_{DS} =	1200	V	T_j:	25 °C
	V_{GS} =	-4/15	V		125 °C
	I_D =	420	A		150 °C

figure 18. **MOSFET**

Typical peak reverse recovery current as a function of drain current

$I_{RM} = f(I_D)$

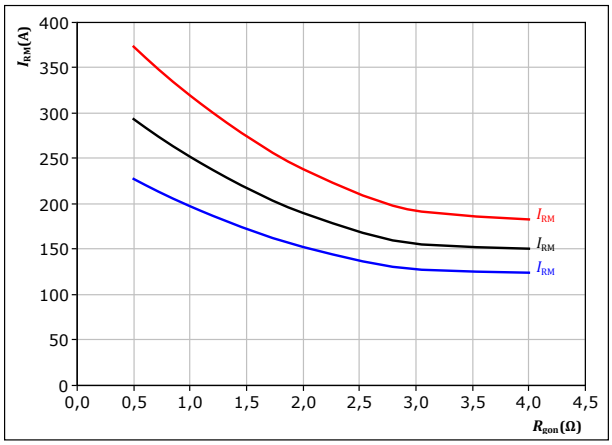


At					
	V_{DS} =	1200	V	T_j:	25 °C
	V_{GS} =	-4/15	V		125 °C
	R_{gon} =	0,5	Ω		150 °C

figure 19. **MOSFET**

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

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



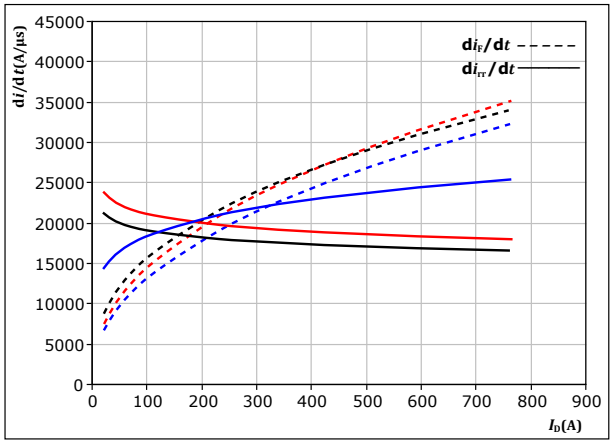
At					
	V_{DS} =	1200	V	T_j:	25 °C
	V_{GS} =	-4/15	V		125 °C
	I_D =	420	A		150 °C

Half-Bridge 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_{rr}/dt = f(I_D)

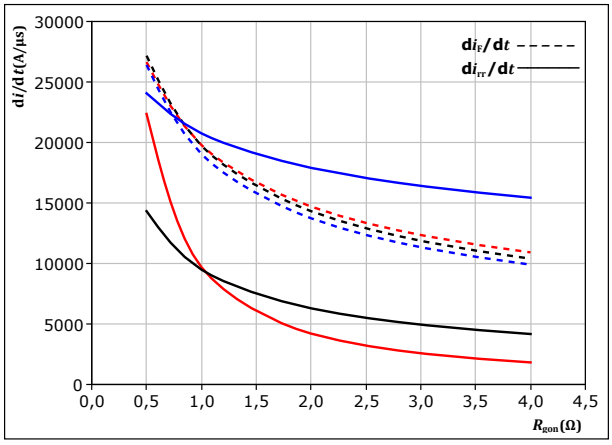


At	V_{DS} =	1200	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	R_{gon} =	0,5	Ω		125 °C
					150 °C

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_{rr}/dt = f(R_{gon})

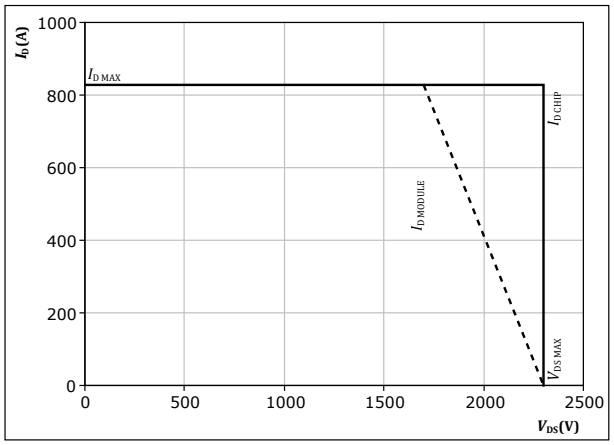


At	V_{DS} =	1200	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	I_D =	420	A		125 °C
					150 °C

figure 22. **MOSFET**

Reverse bias safe operating area

I_D = f(V_{DS})



At	T_j =	150	°C
	R_{gon} =	0,5	Ω
	R_{goff} =	0,5	Ω

Half-Bridge Switching Definitions

figure 23. **MOSFET**

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

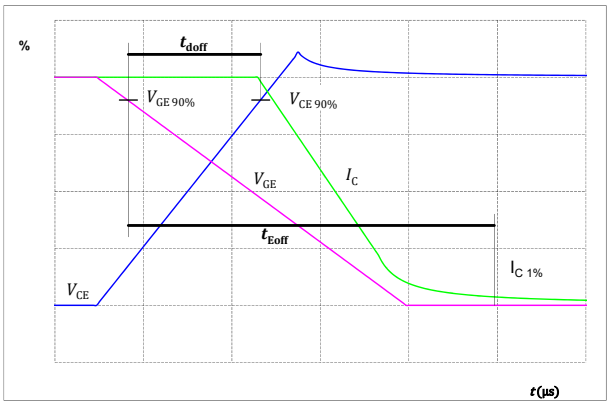


figure 24. **MOSFET**

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

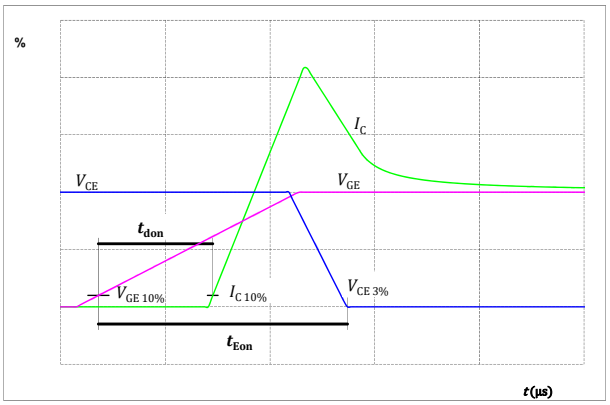


figure 25. **MOSFET**

Turn-off Switching Waveforms & definition of t_f

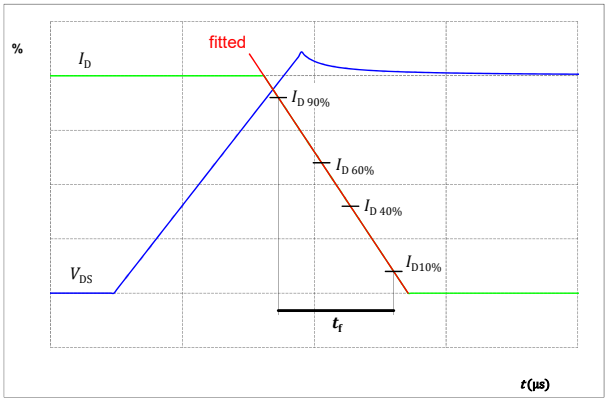
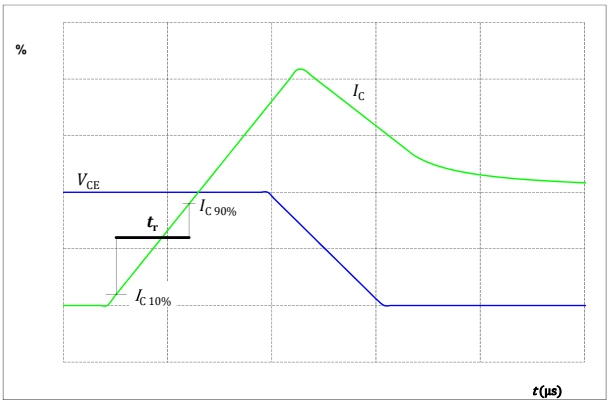


figure 26. **MOSFET**

Turn-on Switching Waveforms & definition of t_r



Half-Bridge Switching Definitions

figure 27. **FWD**

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

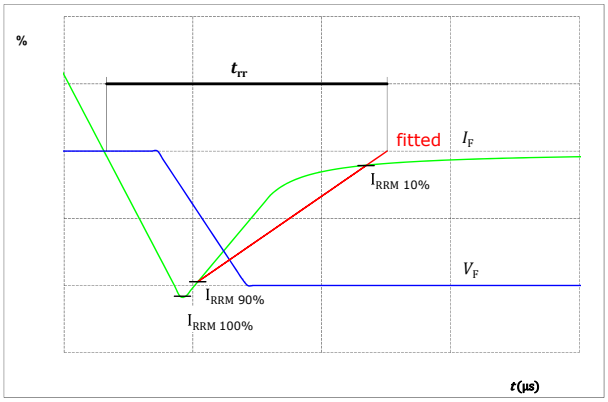


figure 28. **FWD**

Turn-on Switching Waveforms & definition of t_{Qrr} (t_{Qrr} = integrating time for Q_{rr})

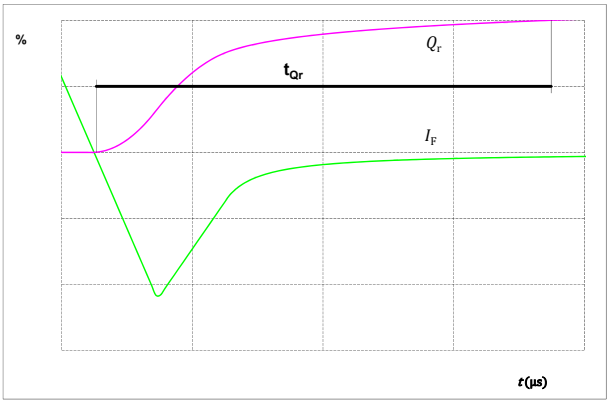
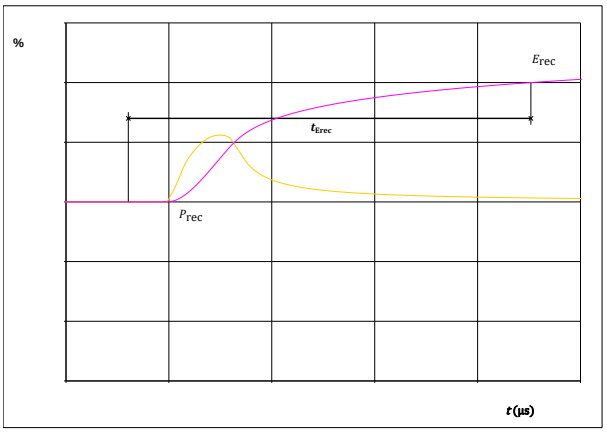


figure 29. **FWD**

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



Ordering Code

Version	Ordering Code
Without thermal paste	10-EY232PB005ME01-PN99F08T
With thermal paste (5,2 W/mK, PTM6000HV)	10-EY232PB005ME01-PN99F08T-/7/

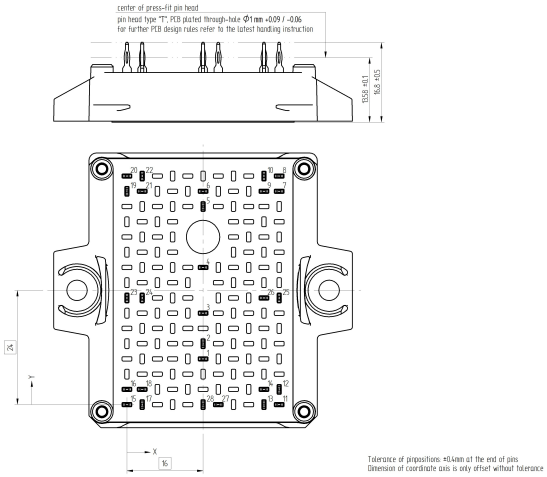
Marking

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

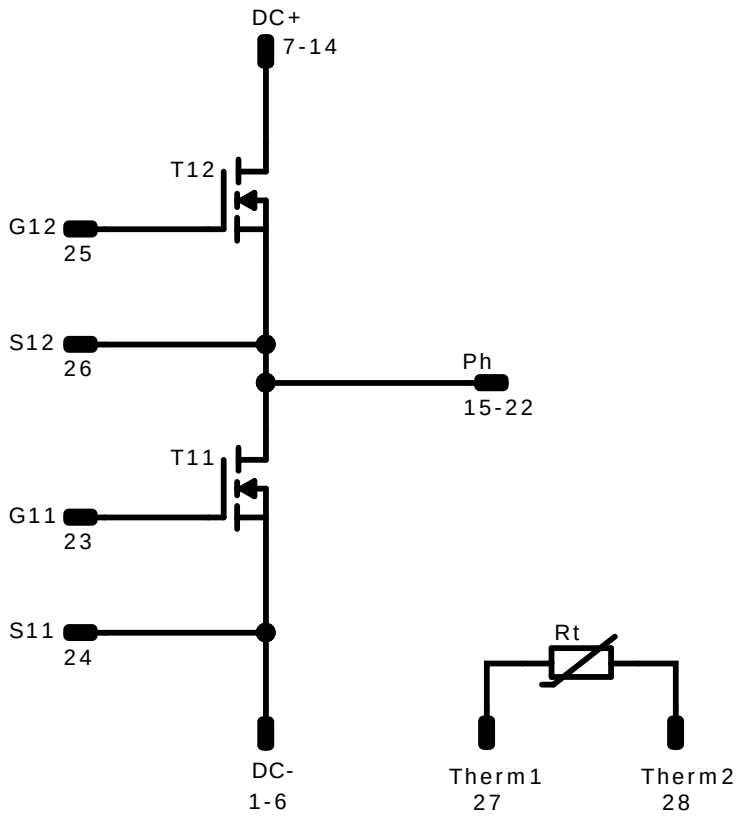
Outline

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



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12	MOSFET	2300 V	5 mΩ	Half-Bridge Switch	
Rt	Thermistor			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 100	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* E2 packages see vincotech.com website.

Package data
Package data for *flow* 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 $T_{j,op}$=175°C and up to 4000VAC/1min isolation voltage. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
10-EY232PB005ME01-PN99F08T-D2-14	26 Nov. 2025	Change Half-Bridge Switch	