10-EY234PB010ME01-PR39F08T
datasheet

fastPACK E2 SiC | 2300 V / 10 mΩ

Topology features

- Kelvin Emitter for improved switching performance
- Open Emitter configuration
- 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
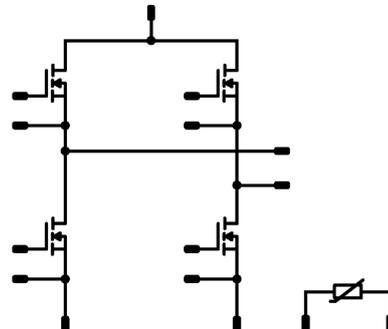- Power Supply
- Solar Inverters
- UPS

Types

- 10-EY234PB010ME01-PR39F08T

flow E2 12 mm housing

Schematic

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Inverter Switch					
Drain-source voltage	V_{DSS}			2300	V
Drain current (DC current)	I_D	$T_j = T_{jmax}$	T_s = 80 °C	115	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}		498	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	384	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

Parameter	Symbol	Conditions	Value	Unit
Storage temperature	T_{stg}		-40…+125	°C
Operation temperature under switching condition	T_{jop}		-40…+(T_{jmax} - 25)	°C

Isolation Properties

Parameter	Symbol	Conditions		Value	Unit
Isolation voltage	V_{isol}	DC Test Voltage*	t_p = 2 s	6800	V
Creepage distance				>12,7	mm
Clearance				9,28	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

Parameter	Symbol	V_{GE}/V_{GS}	V_{CE}/V_{DS}/V_F	I_C/I_D/I_F	T_j	Min	Typ	Max	Unit
Drain-source on-state resistance	$r_{DS(on)}$	15		207	25 125 150		11,7 23,2 27,6	13[1]	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$		0,057	25	1,8	2,5	3,6	V
Gate to Source Leakage Current	I_{GSS}	15	0		25		30	300	nA
Zero Gate Voltage Drain Current	I_{DSS}	0	2300		25		3	30	µA
Internal gate resistance	r_{g}						3,33		Ω
Gate charge	Q_{g}	-4/15	1500	207	25		441		nC
Short-circuit input capacitance	C_{iss}						18000		pF
Short-circuit output capacitance	C_{oss}	f = 100 kHz, 0	1500	0	25		306		
Reverse transfer capacitance	C_{rss}						30		
Diode forward voltage	V_{SD}	0		105	25		5,5		V

Thermal

Parameter	Symbol	Conditions				Min	Typ	Max	Unit
Thermal resistance junction to sink[2]	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)					0,25		K/W

Vincotech

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	$t_{d(on)}$				25 125 150		42,03 38,86 38,68		ns
Rise time	t_{r}				25 125 150		50,31 48,34 47,9		ns
Turn-off delay time	$t_{d(off)}$	R_{gon} = 1 Ω R_{goff} = 1 Ω			25 125 150		163,4 183,85 189,96		ns
Fall time	t_{f}				25 125 150		20,87 27,48 29,11		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,943 µC Q_{rFWD}=3,44 µC Q_{rFWD}=5,48 µC			25 125 150		14,69 16,61 18,66		mWs
Turn-off energy (per pulse)	E_{off}		-4/15	1200	210	25 125 150		8,38 9,67 10,07		mWs
Peak recovery current	I_{RRM}				25 125 150		42,22 80,6 106,03		A
Reverse recovery time	t_{rr}				25 125 150		48,72 72,11 83,37		ns
Recovered charge	Q_{r}	di/dt=4336 A/µs di/dt=3477 A/µs di/dt=3631 A/µs			25 125 150		0,943 3,44 5,48		µC
Reverse recovered energy	E_{rec}				25 125 150		0,438 2,6 4,22		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$				25 125 150		4666,77 4137,12 5735,85		A/µs

15 Aug. 2025 / Revision 2

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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

Parameter	Symbol	Conditions				Values			Unit
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.

Inverter Switch Characteristics

figure 1.   MOSFET

Typical output characteristics

$I_D = f(V_{DS})$

| $t_p =$ | 250 | µs |
| $V_{GS} =$ | 15 | V |

		25 °C
T_j:		125 °C
		150 °C
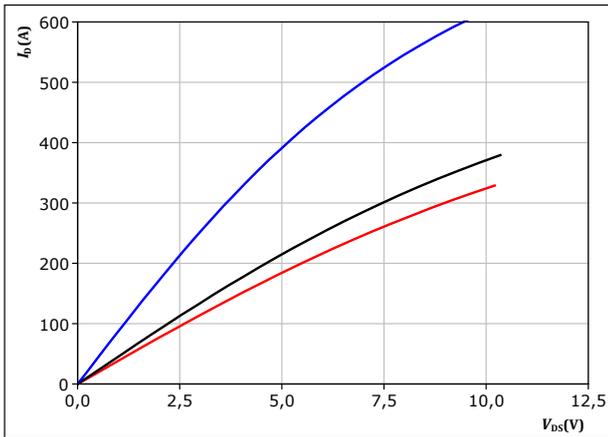
figure 2.   MOSFET

Typical output characteristics

$I_D = f(V_{DS})$

V_{GS}:
-4 V
-2 V
0 V
1 V
3 V
5 V
7 V
9 V
11 V
13 V
15 V
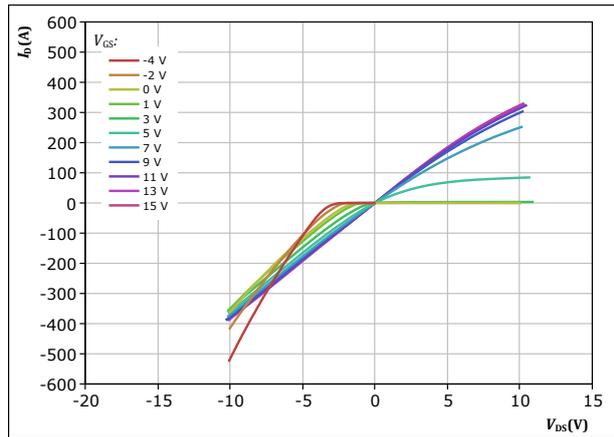
| $t_p =$ | 250 | µs |
| $T_j =$ | 150 | °C |

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 |
| $V_{DS} =$ | 10 | V |

		25 °C
T_j:		125 °C
		150 °C
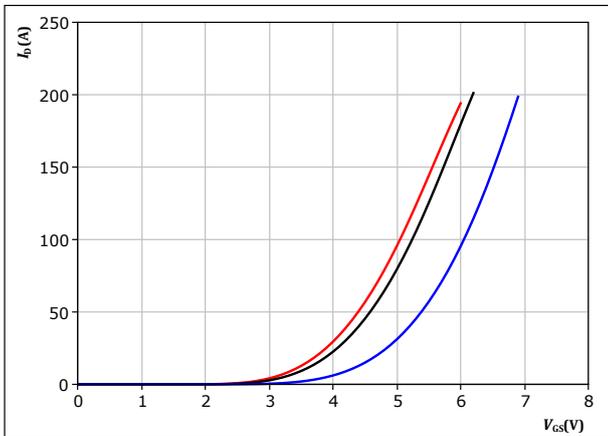
figure 4.   MOSFET

Typical reverse drain current characteristics

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

| $t_p =$ | 250 | µs |
| $V_{GS} =$ | 15 | V |

		25 °C
T_j:		125 °C
		150 °C
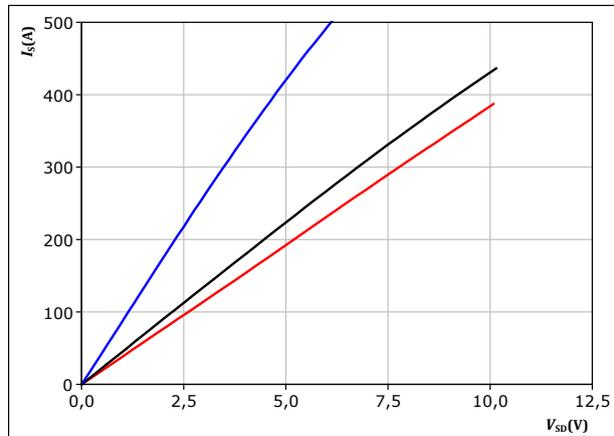
Inverter Switch Characteristics

figure 5. MOSFET

Transient thermal impedance as a function of pulse width

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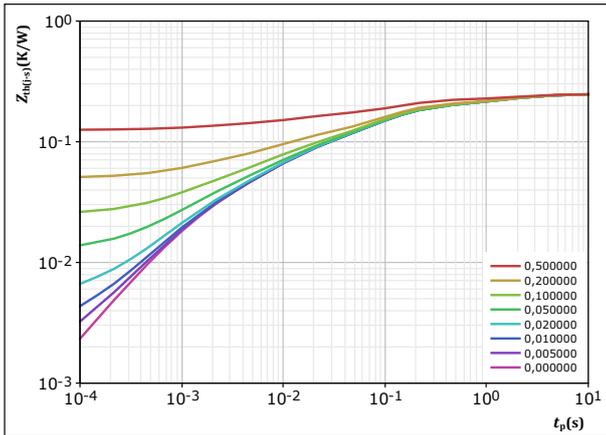
$D = t_p / T$

$R_{th(j-s)} = 0,248$ K/W

MOSFET thermal model values

R (K/W)	τ (s)
1,15E-02	8,20E+00
5,13E-02	1,34E+00
1,17E-01	9,67E-02
5,09E-02	8,78E-03
1,98E-02	1,16E-03

figure 6. MOSFET

Gate voltage vs gate charge

$V_{GS} = f(Q_g)$
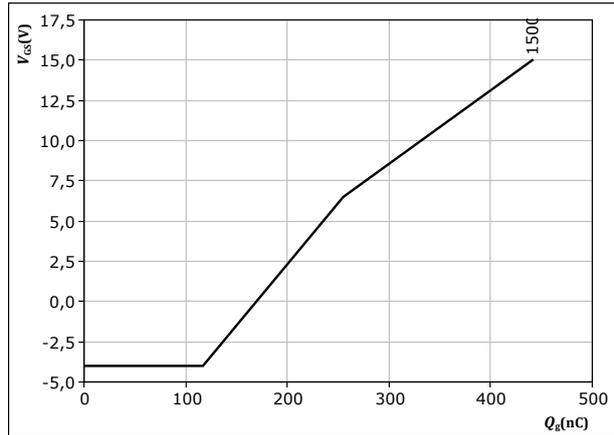
$I_D = 150$ A

$T_j = 25$ °C

Thermistor Characteristics

figure 7.	Thermistor

Typical NTC characteristic as function of temperature

$R_T = f(T)$
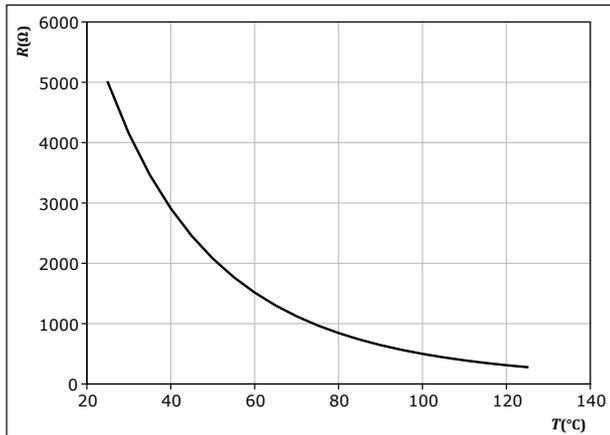
Inverter Switching Characteristics

figure 8. MOSFET
Typical switching energy losses as a function of drain current
$E = f(I_D)$
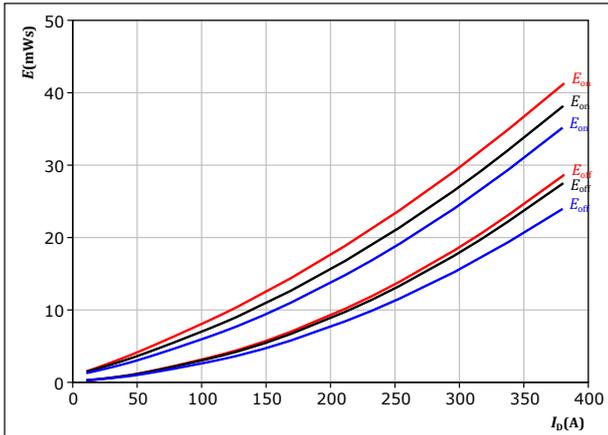
figure 9. MOSFET
Typical switching energy losses as a function of MOSFET turn on gate resistor
$E = f(R_g)$
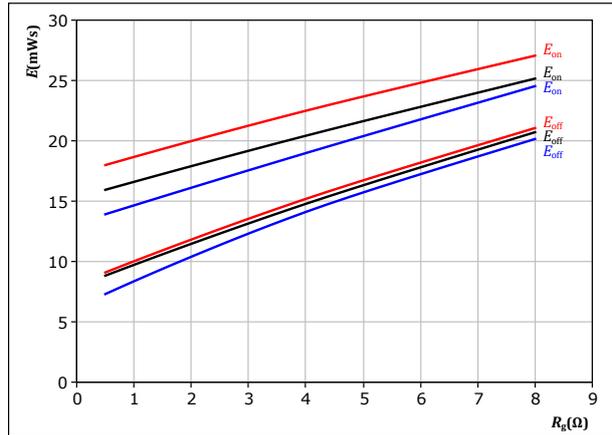
figure 10. MOSFET
Typical reverse recovered energy loss as a function of drain current
$E_{rec} = f(I_D)$
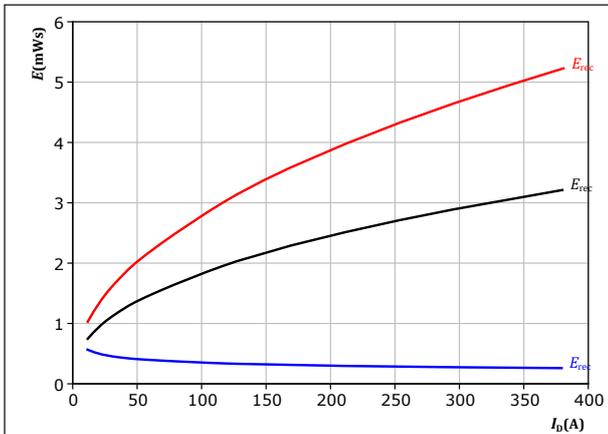
figure 11. MOSFET
Typical reverse recovered energy loss as a function of MOSFET turn on gate resistor
$E_{rec} = f(R_g)$

With an inductive load at
$V_{DS} = 1200$ V
$V_{GS} = -4/15$ V
$R_{gon} = 1$ Ω
$R_{goff} = 1$ Ω
T_j: 25 °C, 125 °C, 150 °C

With an inductive load at
$V_{DS} = 1200$ V
$V_{GS} = -4/15$ V
$I_D = 210$ A
T_j: 25 °C, 125 °C, 150 °C

With an inductive load at
$V_{DS} = 1200$ V
$V_{GS} = -4/15$ V
$R_{gon} = 1$ Ω
T_j: 25 °C, 125 °C, 150 °C
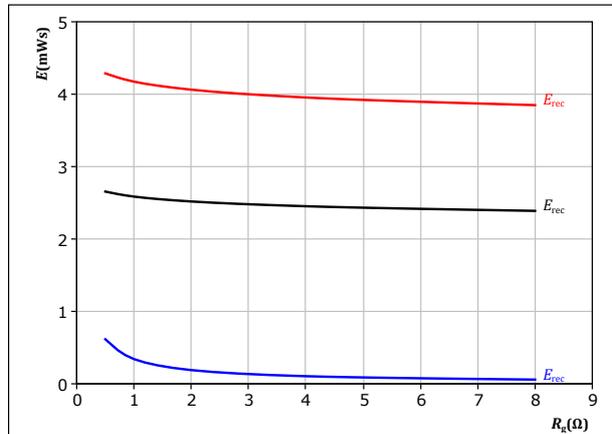
With an inductive load at
$V_{DS} = 1200$ V
$V_{GS} = -4/15$ V
$I_D = 210$ A
T_j: 25 °C, 125 °C, 150 °C

Inverter Switching Characteristics

figure 12.	MOSFET

Typical switching times as a function of drain current

$t = f(I_D)$
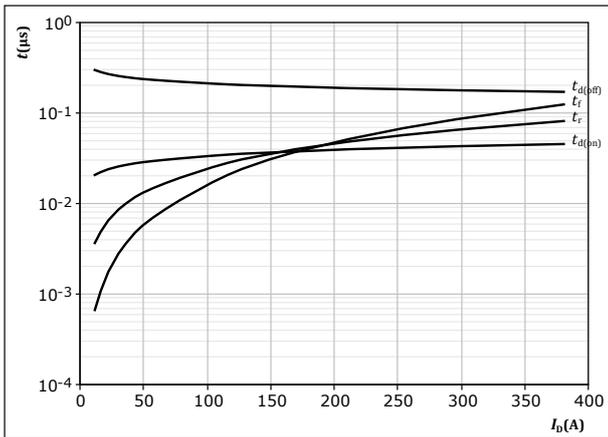
With an inductive load at

$T_j =$	150	°C
$V_{DS} =$	1200	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

$t = f(R_g)$
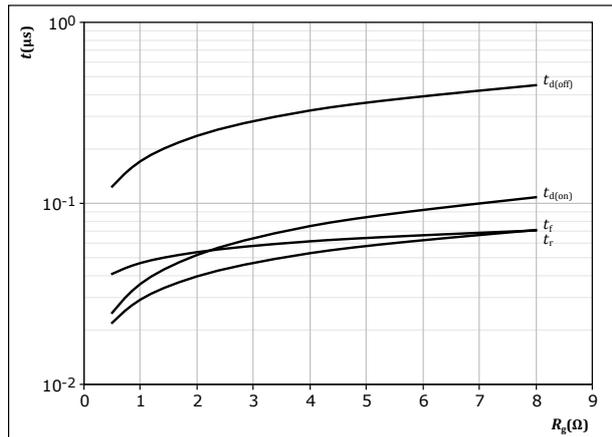
With an inductive load at

$T_j =$	150	°C
$V_{DS} =$	1200	V
$V_{GS} =$	-4/15	V
$I_D =$	210	A

figure 14.	MOSFET

Typical reverse recovery time as a function of drain current

$t_{rr} = f(I_D)$
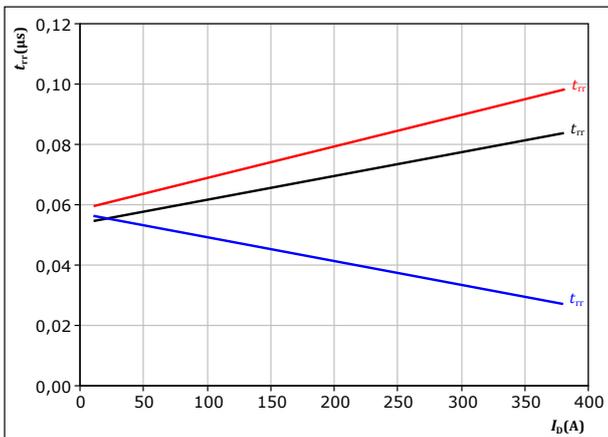
At	$V_{DS} =$	1200	V			25 °C
	$V_{GS} =$	-4/15	V	$T_j:$		125 °C
	$R_{gon} =$	1	Ω			150 °C

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			25 °C
	$V_{GS} =$	-4/15	V	$T_j:$		125 °C
	$I_D =$	210	A			150 °C

Inverter Switching Characteristics

figure 16.	MOSFET

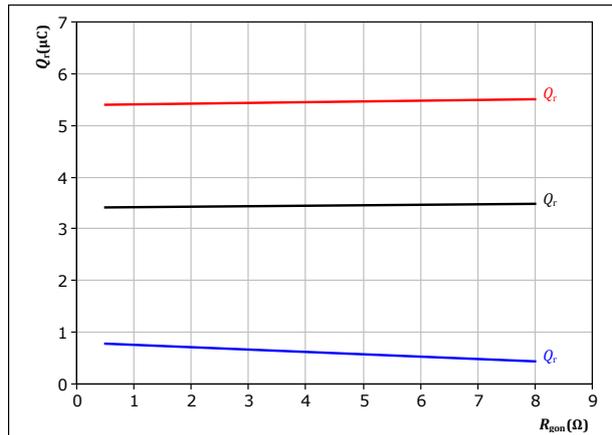**Typical recovered charge as a function of drain current**

$Q_r = f(I_D)$
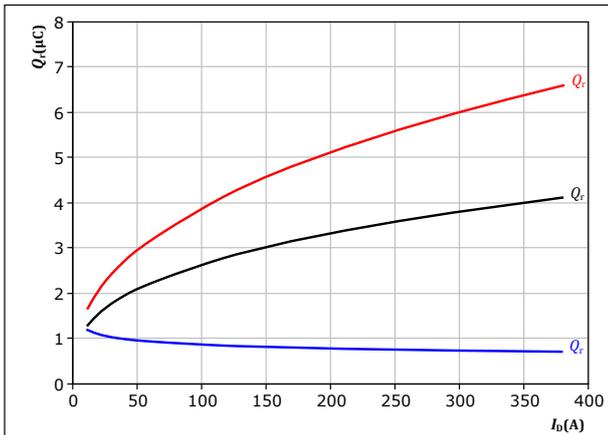
At	V_{DS} =	1200	V			25 °C
	V_{GS} =	-4/15	V	T_j:		125 °C
	R_{gon} =	1	Ω			150 °C

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			25 °C
	V_{GS} =	-4/15	V	T_j:		125 °C
	I_D =	210	A			150 °C

figure 18.	MOSFET

Typical peak reverse recovery current as a function of drain current

$I_{RM} = f(I_D)$
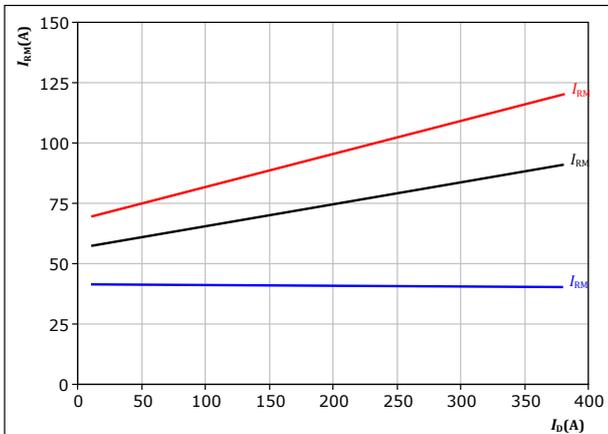
At	V_{DS} =	1200	V			25 °C
	V_{GS} =	-4/15	V	T_j:		125 °C
	R_{gon} =	1	Ω			150 °C

figure 19.	MOSFET

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

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

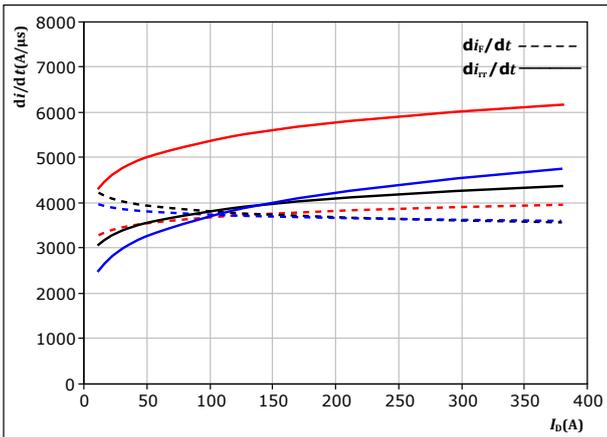| **At**	V_{DS} =	1200	V			25 °C
	V_{GS} =	-4/15	V	T_j:		125 °C
	I_D =	210	A			150 °C

Inverter Switching Characteristics

figure 20. MOSFET

Typical rate of fall of forward and reverse recovery current as a function of drain current
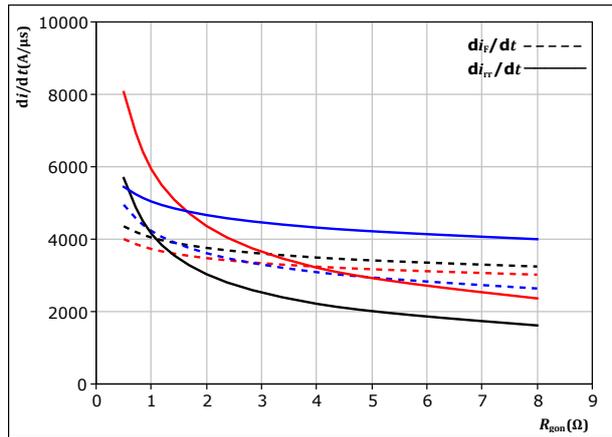
$\mathrm{d}i_F/\mathrm{d}t$, $\mathrm{d}i_{rr}/\mathrm{d}t = f(I_D)$

At	V_{DS} =	1200	V
	V_{GS} =	-4/15	V
	R_{gon} =	1	Ω

25 °C
T_j: 125 °C
150 °C

figure 21. MOSFET

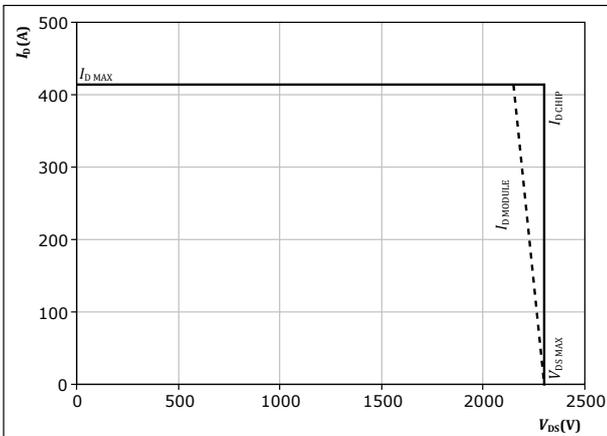Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor

$\mathrm{d}i_F/\mathrm{d}t$, $\mathrm{d}i_{rr}/\mathrm{d}t = f(R_{gon})$

At	V_{DS} =	1200	V
	V_{GS} =	-4/15	V
	I_D =	210	A

25 °C
T_j: 125 °C
150 °C

figure 22. MOSFET

Reverse bias safe operating area

$I_D = f(V_{DS})$
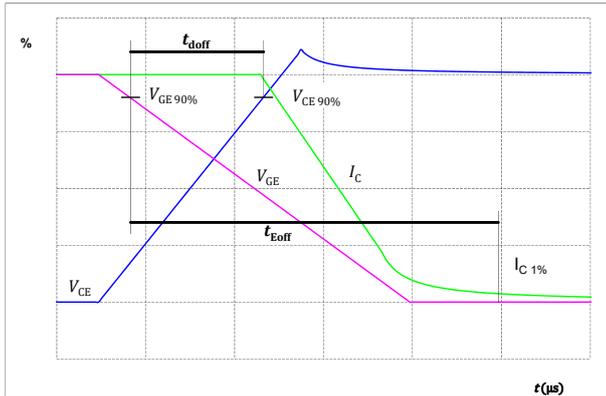
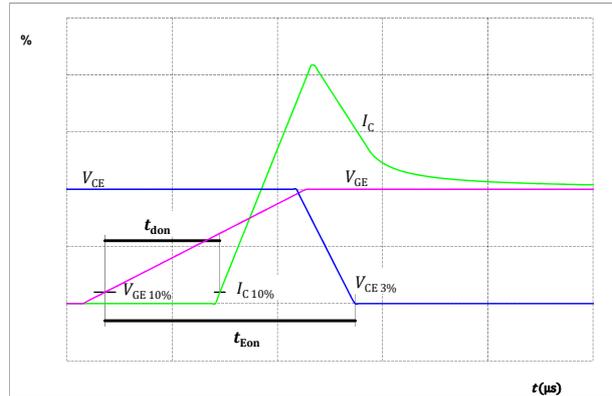| At	T_j =	150	°C
	R_{gon} =	1	Ω
	R_{goff} =	1	Ω

Inverter Switching Definitions

figure 23. MOSFET

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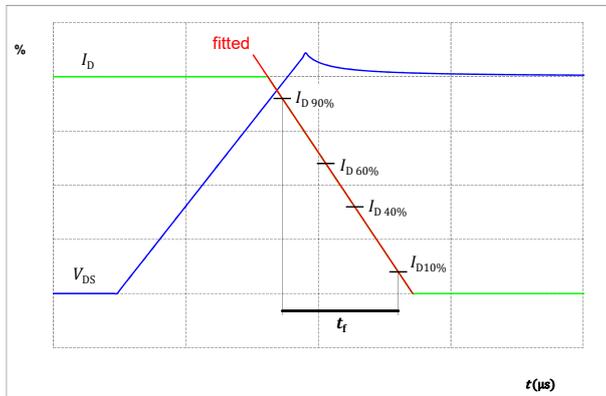

figure 24. MOSFET

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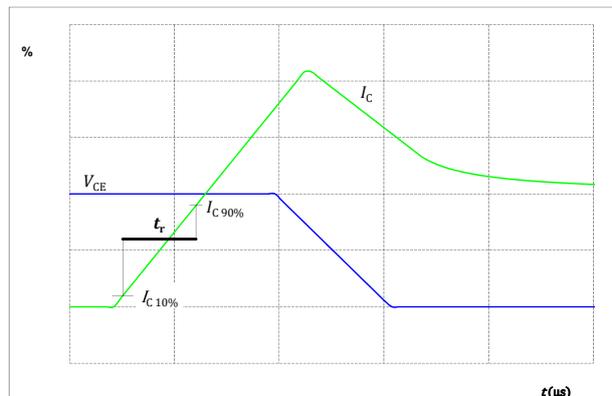

figure 25. MOSFET

Turn-off Switching Waveforms & definition of t_f

figure 26. MOSFET

Turn-on Switching Waveforms & definition of t_r

Vincotech

Ordering Code	
Version	**Ordering Code**
Without thermal paste	10-EY234PB010ME01-PR39F08T
With thermal paste (5,2 W/mK, PTM6000HV)	10-EY234PB010ME01-PR39F08T-/7/

Marking

		Name	Date code	UL & VIN	Lot	Serial
Text		NN-NNNNNNNNNNNNNNN-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	0	0	Ph2
2	3,2	0	Ph2
3	6,4	0	Ph2
4	0	3,25	Ph2
5	3,2	3,2	Ph2
6	6,4	3,2	Ph2
7	3,2	6,4	Ph2
8	3,2	41,6	Ph1
9	6,4	44,8	Ph1
10	3,2	44,8	Ph1
11	0	44,8	Ph1
12	0	48	Ph1
13	3,2	48	Ph1
14	6,4	48	Ph1
15	28,8	48	DC-1
16	32	48	DC-1
17	25,6	44,8	DC-1
18	28,8	44,8	DC-1
19	32	44,8	DC-1
20	28,8	28,8	DC+
21	32	28,8	DC+
22	28,8	25,6	DC+
23	32	25,6	DC+
24	28,8	22,4	DC+
25	32	22,4	DC+
26	32	19,2	DC+
27	28,8	19,2	DC+
28	32	3,2	DC-2
29	32	0	DC-2
30	28,8	3,2	DC-2
31	28,8	0	DC-2
32	25,6	3,2	DC-2
33	22,4	0	G13
34	25,6	0	S13
35	0	9,6	G14
36	0	6,4	S14
37	0	38,4	G12
38	0	41,6	S12
39	22,4	48	G11
40	25,6	48	S11
41	3,2	25,6	Therm1
42	3,2	22,4	Therm2

center of press-fit pin head
pin head type "T", PCB plated through-hole Φ1mm +0.09 / -0.06
for further PCB design rules refer to the latest handling instruction

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

Pinout

DC+
20-27

T12
G12
37
S12
38

T14
G14
35
S14
36

Ph1
8-14

Ph2
1-7

T11
G11
39
S11
40

T13
G13
33
S13
34

Rt

15-19
DC-1

28-32
DC-2

41
Therm1

42
Therm2

Identification					
ID	**Component**	**Voltage**	**Current**	**Function**	**Comment**
T11, T12, T13, T14	MOSFET	2300 V	10 mΩ	Inverter Switch	
Rt	Thermistor			Thermistor	

Vincotech

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.	®UL

Document No.:	Date:	Modification:	Pages
10-EY234PB010ME01-PR39F08T-D1-14	5 Jun. 2025	Initial Release	
10-EY234PB010ME01-PR39F08T-D2-14	15 Aug. 2025	Add low current measurements to Dynamic Characteristics	