



Vincotech

10-EZ122PA015MS-LJ67F78T

datasheet

flowDUAL E1 SiC

1200 V / 15 mΩ

Topology features

- Temperature sensor
- Half Bridge

Component features

- High Blocking Voltage with low drain source on state resistance
- High speed SiC-MOSFET technology
- Resistant to Latch-up

Housing features

- Base isolation: Al₂O₃
- 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
- Servo Drives
- Solar Inverters
- UPS

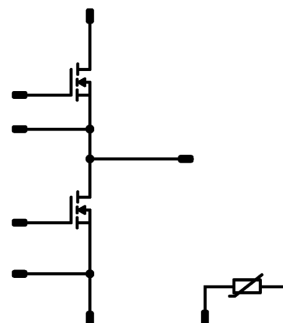
Types

- 10-EZ122PA015MS-LJ67F78T

flow E1 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}		1200	V
Drain current (DC current)	I_D	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	87	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	320	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	166	W
Gate-source voltage	V_{GS}	static	-5 / 18	V
		dynamic	-10 / 22	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* $t_p = 2\text{ s}$	6000	V
Creepage distance			>12,7	mm
Clearance			8,62	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	$r_{DS(on)}$		18		80	25 125 150		14,8 18,5 20,4	22,5 ⁽¹⁾	mΩ
Gate-source threshold voltage	$V_{GS(th)}$				0,008	25	1,7	2,25	2,75	V
Gate to Source Leakage Current	I_{GSS}		22	0		25			200	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1200		25			20	μA
Internal gate resistance	r_g							1		Ω
Gate charge	Q_g		-5/18	800	80	25		216		nC
Short-circuit input capacitance	C_{iss}	$f = 500$ kHz	0	800	0	25		5200		pF
Short-circuit output capacitance	C_{oss}							270		
Reverse transfer capacitance	C_{rss}							12		
Diode forward voltage	V_{SD}		0		80	25		4,1		V

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,57		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	$t_{d(on)}$	$R_{gon} = 8 \Omega$ $R_{goff} = 8 \Omega$	-5/18	600	80	25		40,95		ns	
						125		45,76			
						150		44,28			
Rise time	t_r					25		26,13		ns	
						125		20,66			
						150		20,2			
Turn-off delay time	$t_{d(off)}$					25		75,98		ns	
						125		88,65			
						150		91,17			
Fall time	t_f					25		14,06		ns	
						125		12,26			
						150		11,42			
Turn-on energy (per pulse)	E_{on}	$Q_{rFWD}=0,345 \mu C$ $Q_{rFWD}=1,1 \mu C$ $Q_{rFWD}=1,32 \mu C$	25		1,77		mWs				
			125		1,85						
			150		1,91						
Turn-off energy (per pulse)	E_{off}		25		0,449		mWs				
			125		0,501						
			150		0,511						
Peak recovery current	I_{RRM}	$di/dt=3585 A/\mu s$ $di/dt=4277 A/\mu s$ $di/dt=4335 A/\mu s$	25		31,14		A				
			125		56,86						
			150		64,83						
Reverse recovery time	t_{rr}		25		19,41		ns				
			125		30,96						
			150		32						
Recovered charge	Q_r		25		0,345		μC				
			125		1,1						
			150		1,32						
Reverse recovered energy	E_{rec}		25		0,04		mWs				
			125		0,231						
			150		0,272						
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$	25		4041,86		A/ μs					
		125		4072,4							
		150		5110,61							



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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.



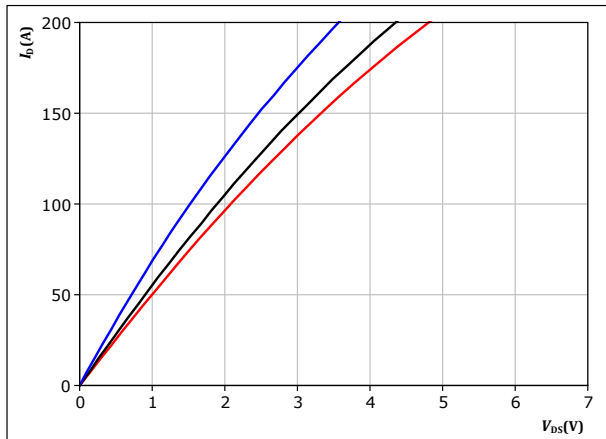
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Inverter Switch Characteristics

figure 1. MOSFET

Typical output characteristics

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

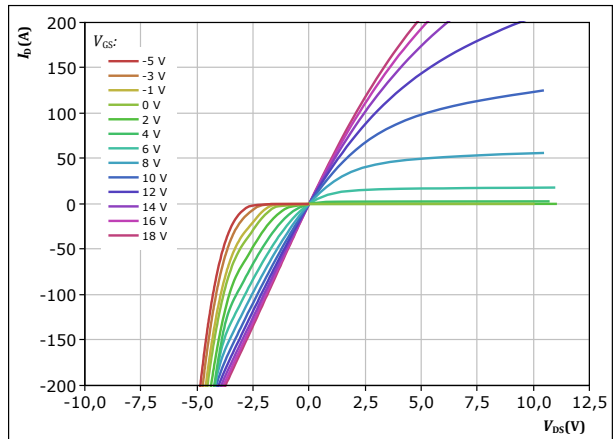


$t_p = 250 \mu s$
 $V_{GS} = 18 V$
 $T_j: 25 ^\circ C$
 $125 ^\circ C$
 $150 ^\circ C$

figure 2. MOSFET

Typical output characteristics

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

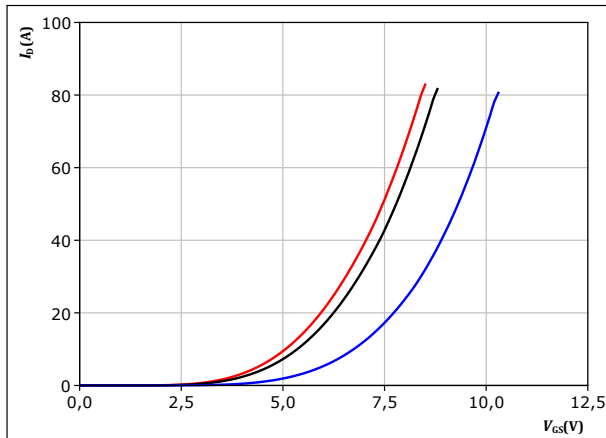


$t_p = 250 \mu s$
 $T_j = 150 ^\circ C$
 V_{GS} from -5 V to 18 V in steps of 2 V

figure 3. MOSFET

Typical transfer characteristics

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

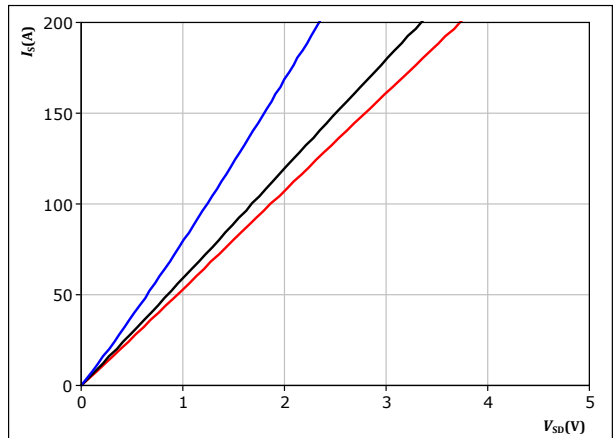


$t_p = 250 \mu s$
 $V_{DS} = 30 V$
 $T_j: 25 ^\circ C$
 $125 ^\circ C$
 $150 ^\circ C$

figure 4. MOSFET

Typical reverse drain current characteristics

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



$t_p = 250 \mu s$
 $V_{GS} = 18 V$
 $T_j: 25 ^\circ C$
 $125 ^\circ C$
 $150 ^\circ C$



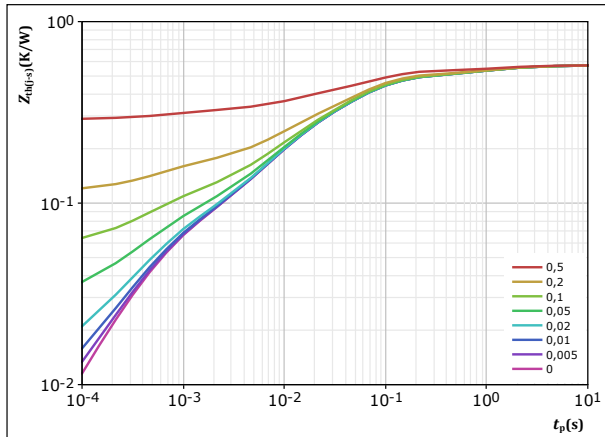
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Inverter Switch Characteristics

figure 5. MOSFET

Transient thermal impedance as a function of pulse width

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



$$D = \frac{t_p}{T}$$

$$R_{th(j-a)} = 0,574 \text{ K/W}$$

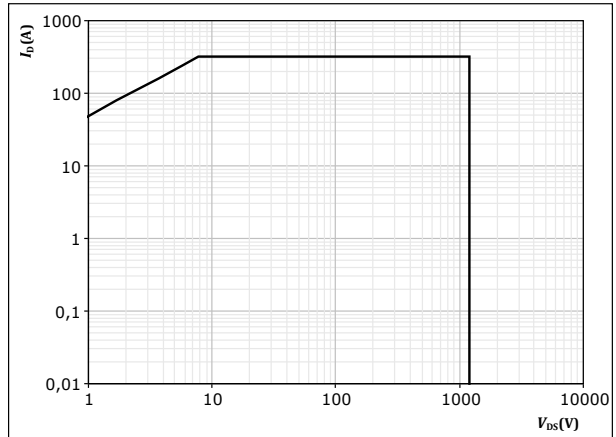
MOSFET thermal model values

R (K/W)	τ (s)
1,49E-02	7,19E+00
7,90E-02	9,10E-01
2,88E-01	5,48E-02
1,41E-01	8,91E-03
5,45E-02	5,28E-04

figure 6. MOSFET

Safe operating area

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



D = single pulse

$$T_a = 80 \text{ }^{\circ}\text{C}$$

$$V_{GS} = 18 \text{ V}$$

$$T_j = T_{jmax}$$



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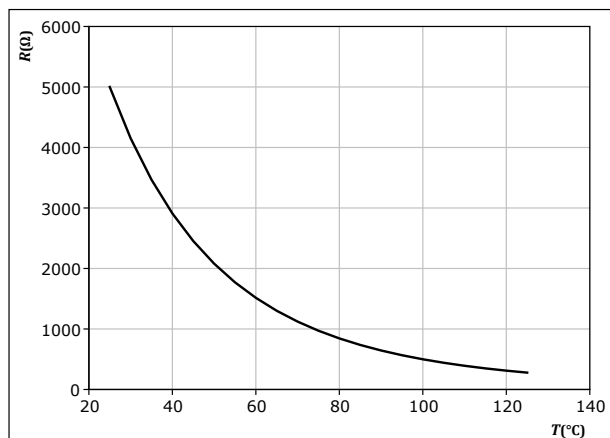
Thermistor Characteristics

figure 7.

Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$





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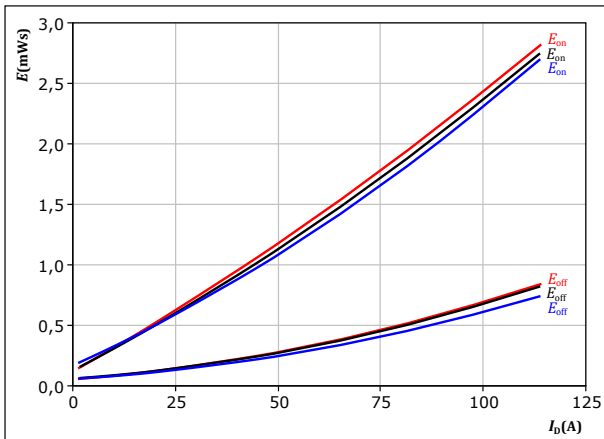
Inverter Switching Characteristics

figure 8.

MOSFET

Typical switching energy losses as a function of drain current

$$E = f(I_D)$$



With an inductive load at

$V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 8$ Ω
 $R_{goff} = 8$ Ω

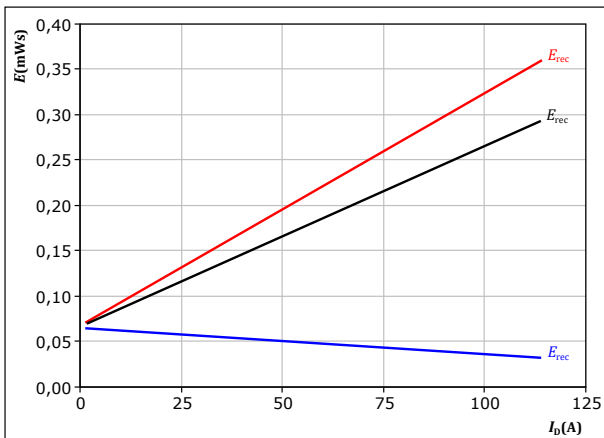
T_j :
— 25 °C
— 125 °C
— 150 °C

figure 10.

MOSFET

Typical reverse recovered energy loss as a function of drain current

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



With an inductive load at

$V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 8$ Ω

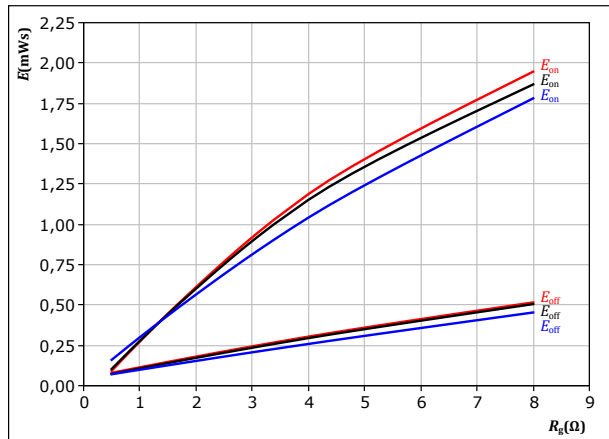
T_j :
— 25 °C
— 125 °C
— 150 °C

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

$V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 80$ A

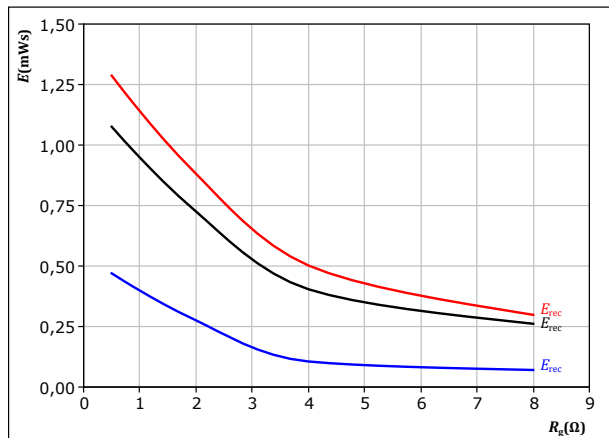
T_j :
— 25 °C
— 125 °C
— 150 °C

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

$V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 80$ A

T_j :
— 25 °C
— 125 °C
— 150 °C



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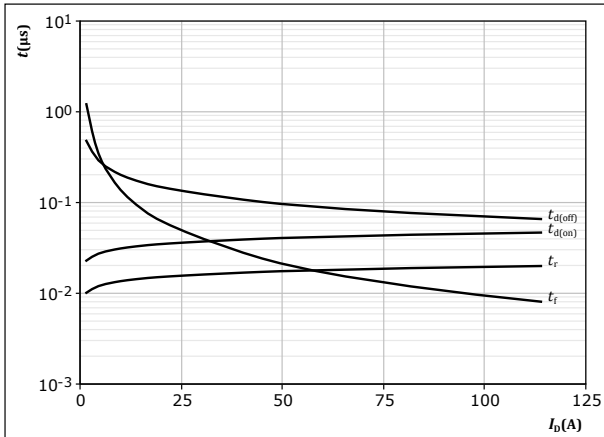
10-EZ122PA015MS-LJ67F78T datasheet

Inverter Switching Characteristics

figure 12.

MOSFET

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



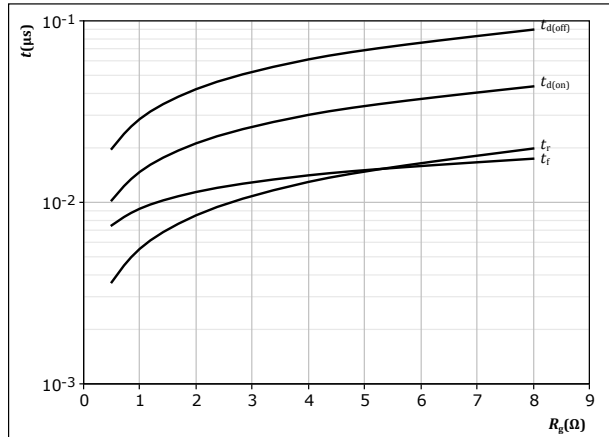
With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 8$ Ω
 $R_{goff} = 8$ Ω

figure 13.

MOSFET

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



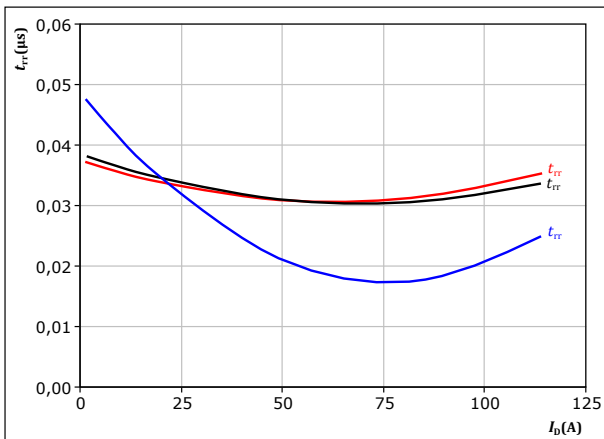
With an inductive load at

$T_j = 150$ °C
 $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 80$ A

figure 14.

MOSFET

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



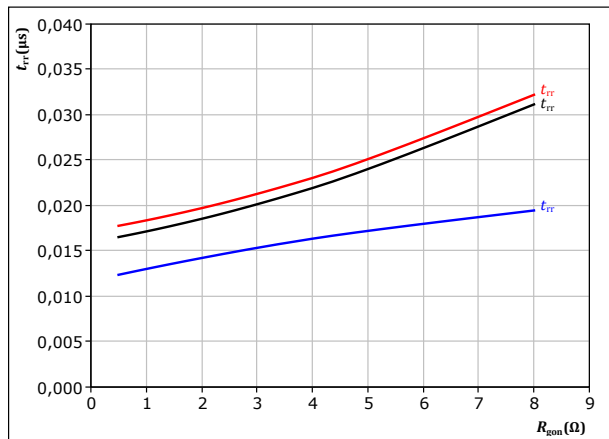
At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 8$ Ω

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 $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 80$ A

T_j : — 25 °C
— 125 °C
— 150 °C



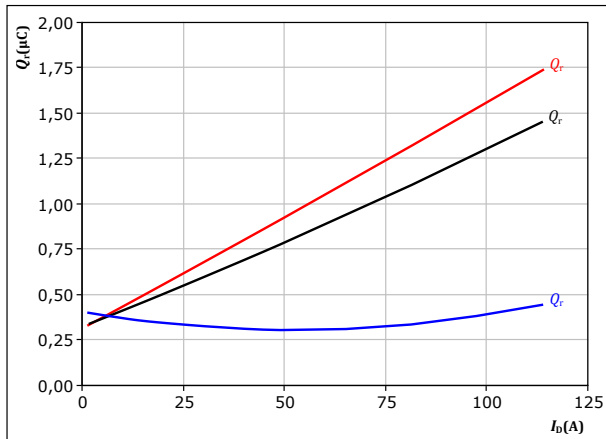
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Inverter Switching Characteristics

figure 16. MOSFET

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$

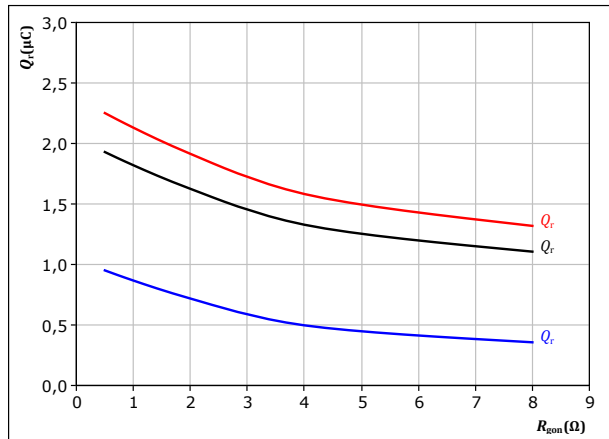


At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 8$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 17. MOSFET

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

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

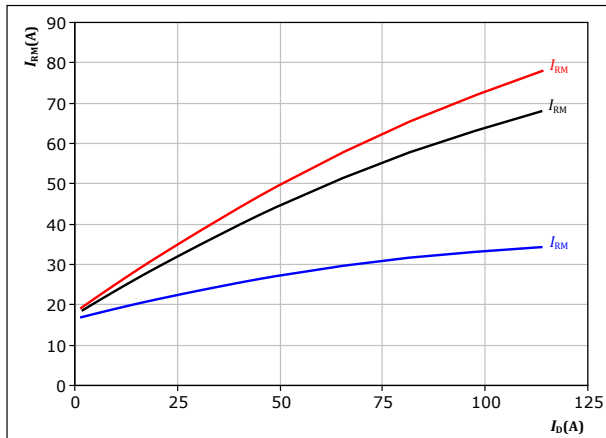


At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 80$ A
 T_j : 25 °C
125 °C
150 °C

figure 18. MOSFET

Typical peak reverse recovery current as a function of drain current

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

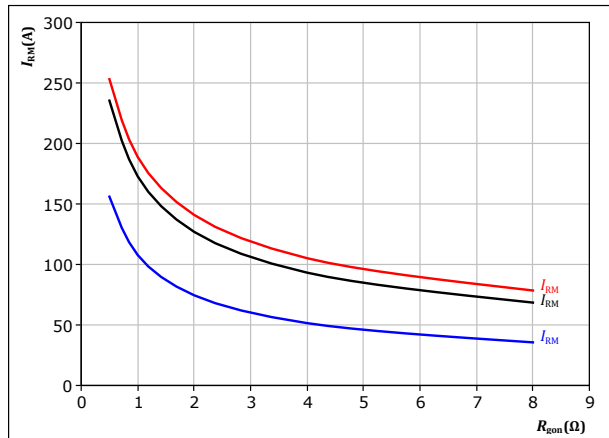


At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 8$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 19. MOSFET

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

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



At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 80$ A
 T_j : 25 °C
125 °C
150 °C



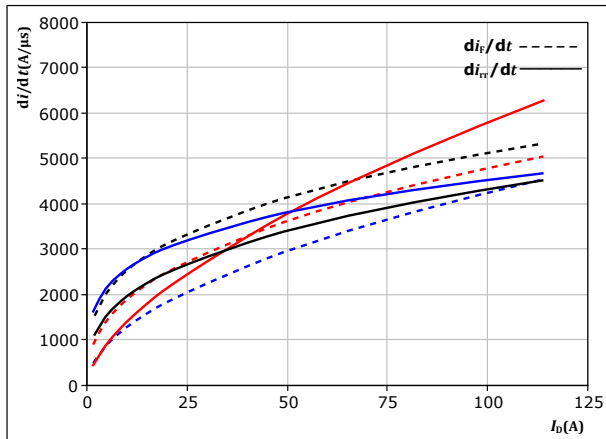
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Inverter Switching Characteristics

figure 20. MOSFET

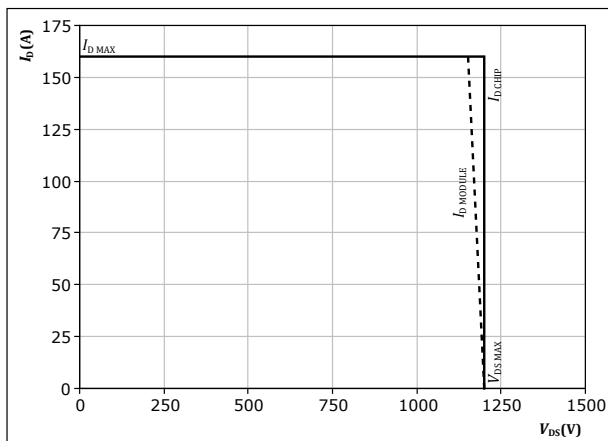
Typical rate of fall of forward and reverse recovery current as a function of drain current
 $di_f/dt, di_r/dt = f(I_D)$



At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 8$ Ω
 $T_j = 25$ °C
 $T_j = 125$ °C
 $T_j = 150$ °C

figure 22. MOSFET

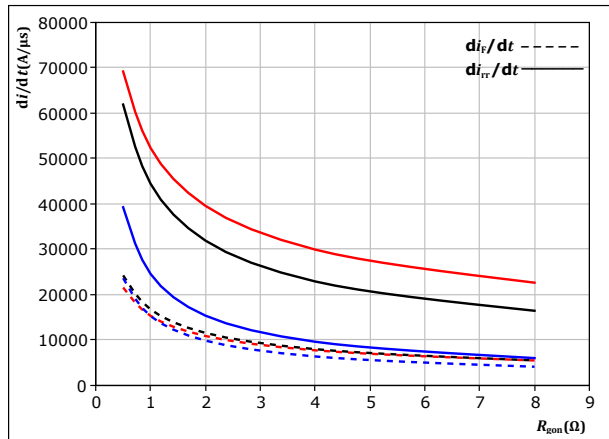
Reverse bias safe operating area
 $I_D = f(V_{DS})$



At $T_j = 150$ °C
 $R_{gon} = 8$ Ω
 $R_{goff} = 8$ 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 $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 80$ 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})

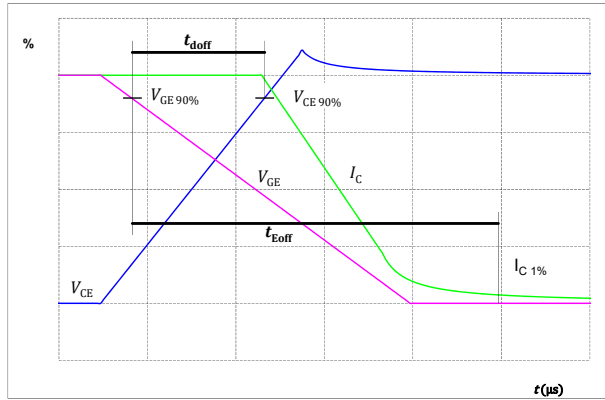


figure 24. MOSFET

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

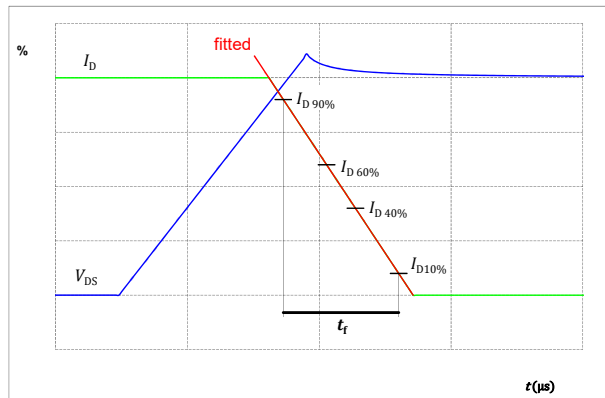
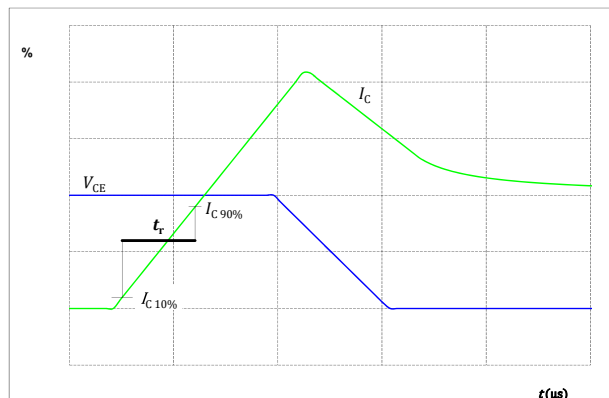


figure 26. MOSFET

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)

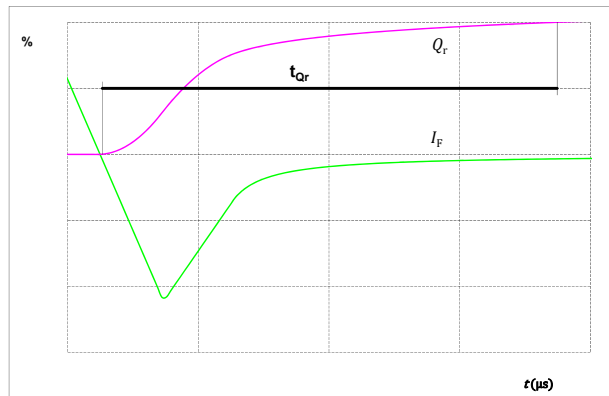
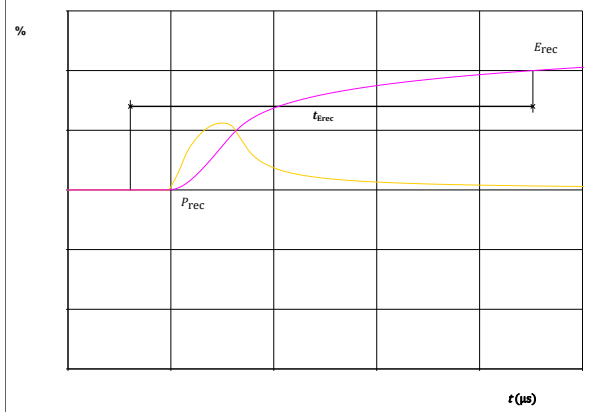


figure 29.

FWD

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





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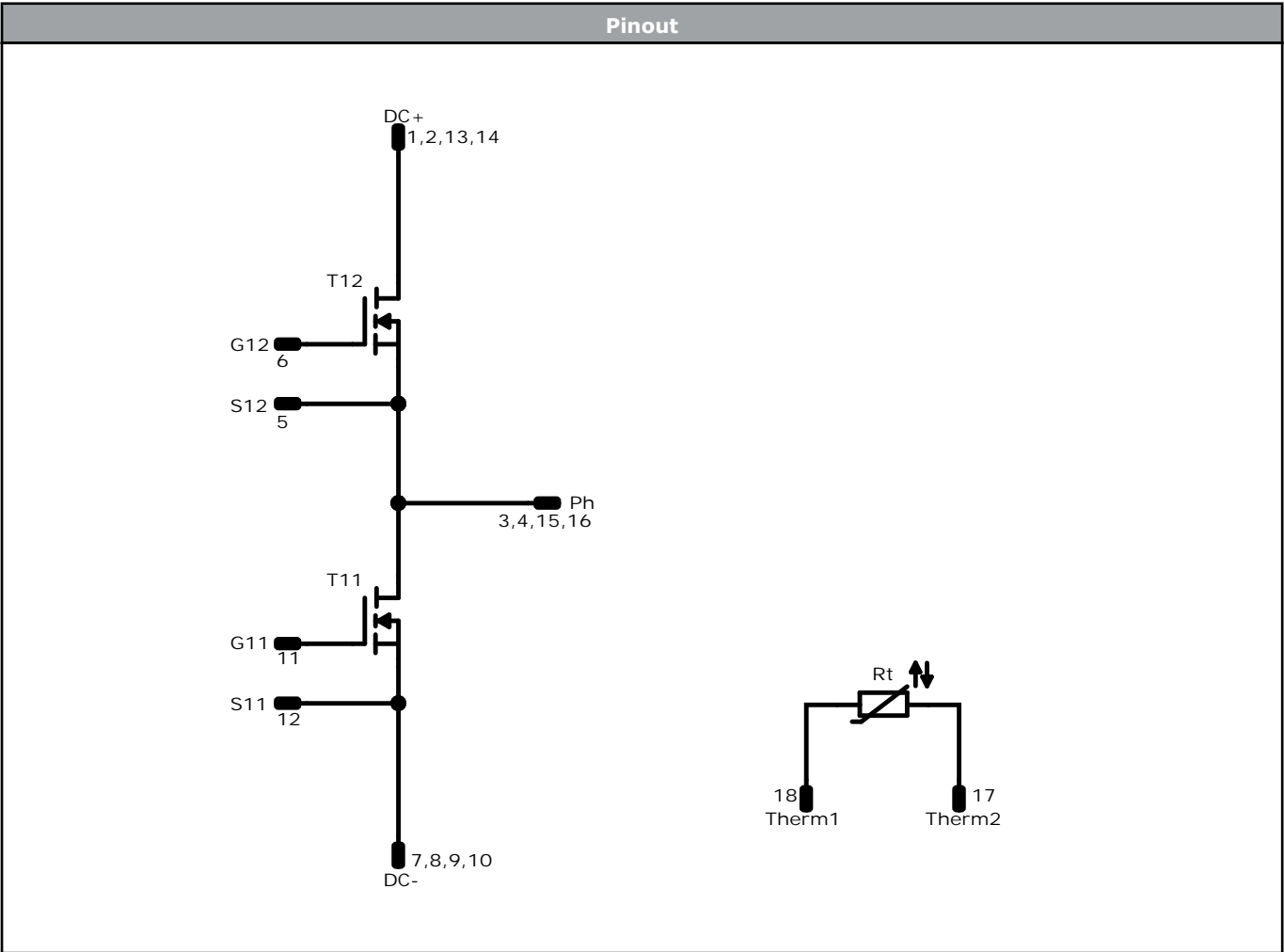
Ordering Code	
Version	Ordering Code
Without thermal paste	10-EZ122PA015MS-LJ67F78T
With thermal paste (5,2 W/mK, PTM6000HV)	10-EZ122PA015MS-LJ67F78T-/7/

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

Outline

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

Tolerance of pinpositions: ±0,4mm at the end of pins
Dimension of coordinate axis is only offset without tolerance




Identification					
ID	Component	Voltage	Current	Function	Comment
T11, T12	MOSFET	1200 V	15 mΩ	Inverter Switch	
Rt	Thermistor			Thermistor	



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Packaging instruction				
Standard packaging quantity (SPQ) 100	>SPQ	Standard	<SPQ	Sample
Handling instruction				
Handling instructions for <i>flow</i> E1 packages see vincotech.com website.				
Package data				
Package data for <i>flow</i> E1 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 3500VAC/1min isolation voltage. For more information see vincotech.com website.				

Document No.:	Date:	Modification:	Pages
10-EZ122PA015MS-LJ67F78T-D1-14	8 Jan. 2026	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.