



Vincotech

10-EZ122PA020MS-LJ66F78T

datasheet

flowDUAL E1 SiC

1200 V / 20 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

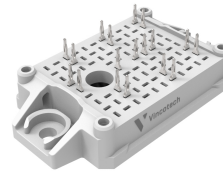
Target applications

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

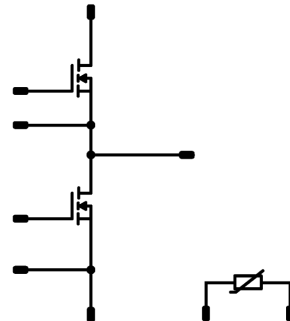
Types

- 10-EZ122PA020MS-LJ66F78T

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	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	71	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	240	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	147	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		60	25 125 150		22,5 26,2 28,3	29,5 ⁽¹⁾	mΩ
Gate-source threshold voltage	$V_{GS(th)}$				0,006	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		170		nC
Short-circuit input capacitance	C_{iss}	$f = 500 \text{ kHz}$	0	800	0	25		4000		pF
Short-circuit output capacitance	C_{oss}							224		
Reverse transfer capacitance	C_{rss}							10		
Diode forward voltage	V_{SD}		0		60	25		4,1		V

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{\text{paste}} = 5,2 \text{ W/mK}$ (PTM)						0,65		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	$t_{d(on)}$	$R_{gon} = 4\ \Omega$ $R_{goff} = 4\ \Omega$	-5/18	600	60	25		26,44		ns	
						125		24,07			
						150		23,52			
Rise time	t_r					25		11,11		ns	
						125		9,99			
						150		9,74			
Turn-off delay time	$t_{d(off)}$					25		48,43		ns	
						125		54,67			
						150		56,35			
Fall time	t_f					25		18,35		ns	
						125		21,36			
						150		22,88			
Turn-on energy (per pulse)	E_{on}	$Q_{rFWD}=0,467\ \mu C$ $Q_{rFWD}=1,09\ \mu C$ $Q_{rFWD}=1,34\ \mu C$	25		0,617		mWs				
			125		0,686						
			150		0,711						
Turn-off energy (per pulse)	E_{off}		25		0,174		mWs				
			125		0,205						
			150		0,209						
Peak recovery current	I_{RRM}	$di/dt=7715\ A/\mu s$ $di/dt=8238\ A/\mu s$ $di/dt=9445\ A/\mu s$	25		51,01		A				
			125		89,39						
			150		101,53						
Reverse recovery time	t_{rr}		25		16,4		ns				
			125		23,45						
			150		24,09						
Recovered charge	Q_r		25		0,467		μC				
			125		1,09						
			150		1,34						
Reverse recovered energy	E_{rec}		25		0,093		mWs				
			125		0,249						
			150		0,339						
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$		25		8900,62		A/ μs				
			125		18979,08						
			150		27157,73						



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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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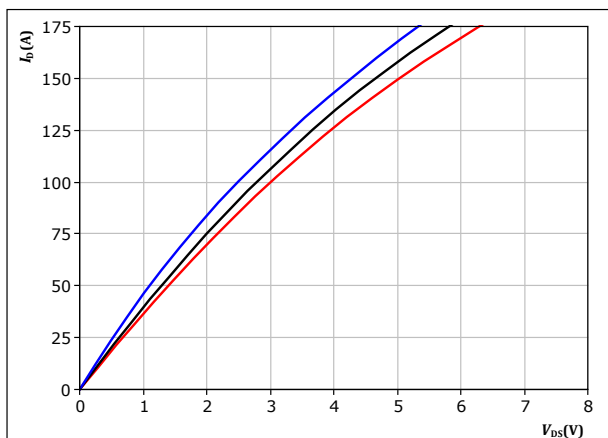
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Inverter Switch Characteristics

figure 1. MOSFET

Typical output characteristics

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

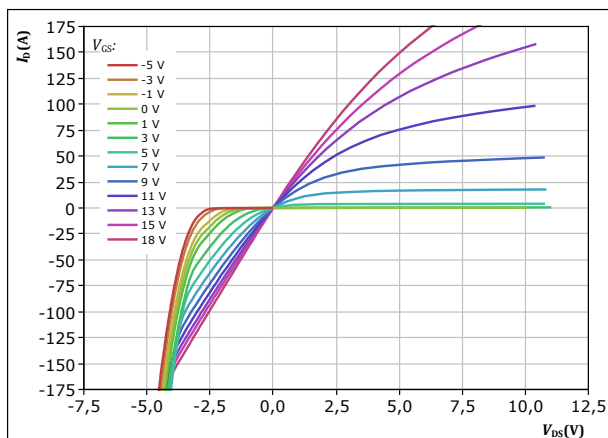


$t_p = 250 \mu s$
 $V_{GS} = 18 V$
 $T_j: 25 ^\circ C$
 $125 ^\circ C$
 $150 ^\circ C$

figure 2. MOSFET

Typical output characteristics

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

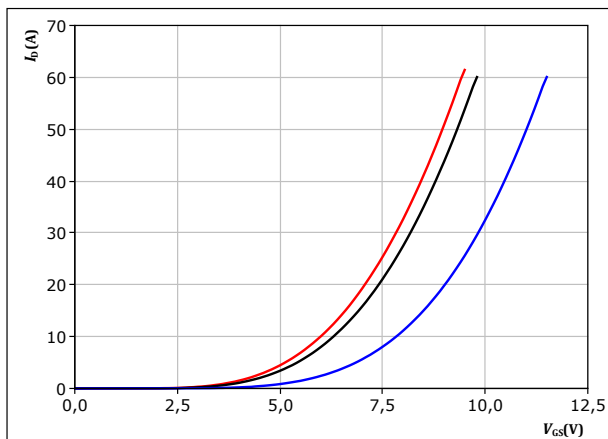


$t_p = 250 \mu s$
 $T_j = 150 ^\circ C$
 V_{GS} from -5 V to 18 V in steps of 2 V

figure 3. MOSFET

Typical transfer characteristics

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

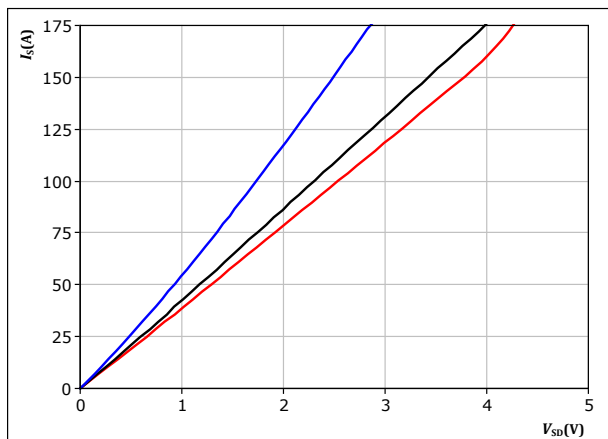


$t_p = 250 \mu s$
 $V_{DS} = 10 V$
 $T_j: 25 ^\circ C$
 $125 ^\circ C$
 $150 ^\circ C$

figure 4. MOSFET

Typical reverse drain current characteristics

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



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

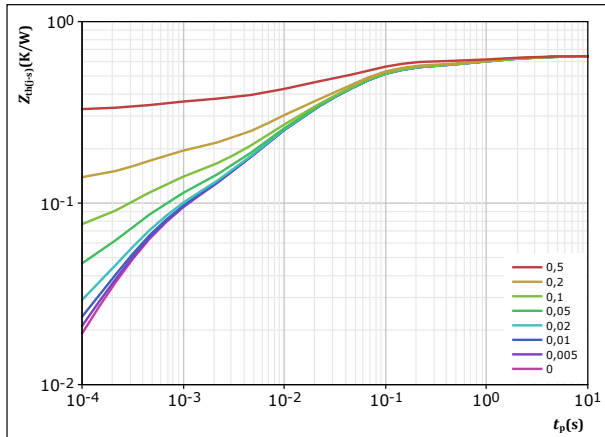


Inverter Switch Characteristics

figure 5. MOSFET

Transient thermal impedance as a function of pulse width

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



$$D = t_p / T$$

$$R_{th(j-a)} = 0,645 \text{ K/W}$$

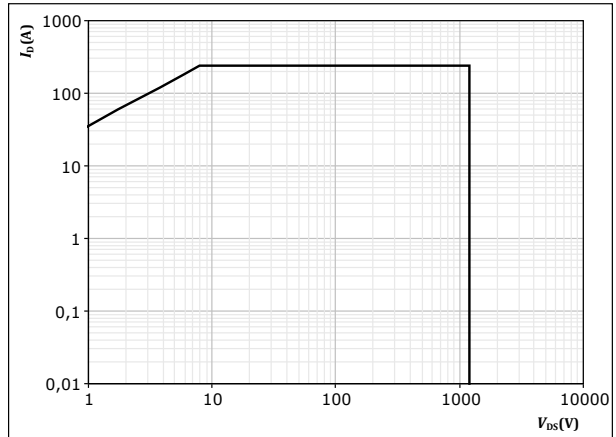
MOSFET thermal model values

R (K/W)	τ (s)
1,69E-02	7,08E+00
8,50E-02	9,54E-01
3,19E-01	4,78E-02
1,54E-01	6,83E-03
7,33E-02	4,00E-04

figure 6. MOSFET

Safe operating area

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



$D = \text{single pulse}$

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

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

$$T_j = T_{jmax}$$



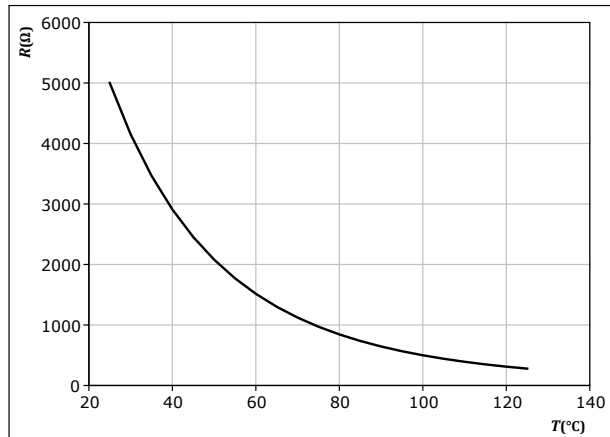
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Thermistor Characteristics

figure 7. Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$





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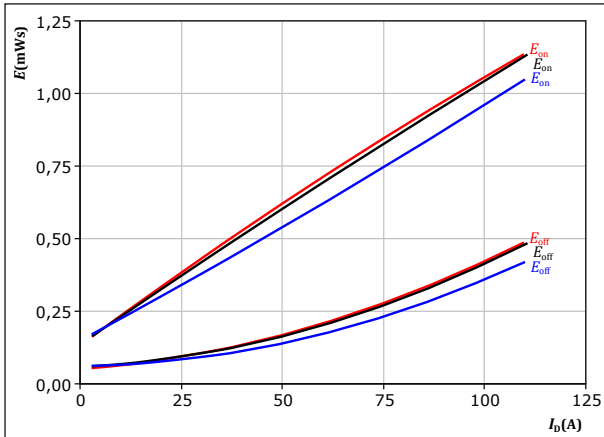
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Inverter Switching Characteristics

figure 8. MOSFET

Typical switching energy losses as a function of drain current

$$E = f(I_D)$$



With an inductive load at

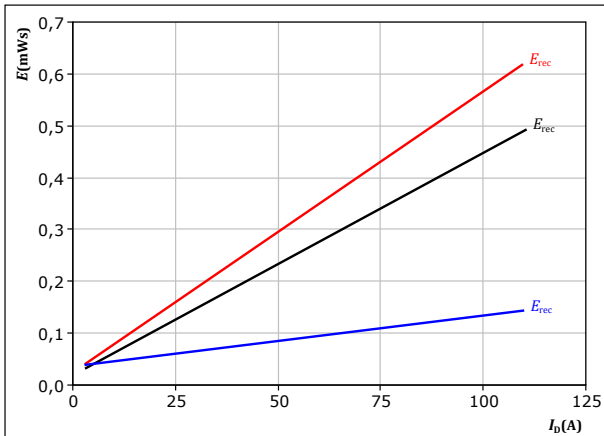
$V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 4$ Ω
 $R_{goff} = 4$ Ω

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

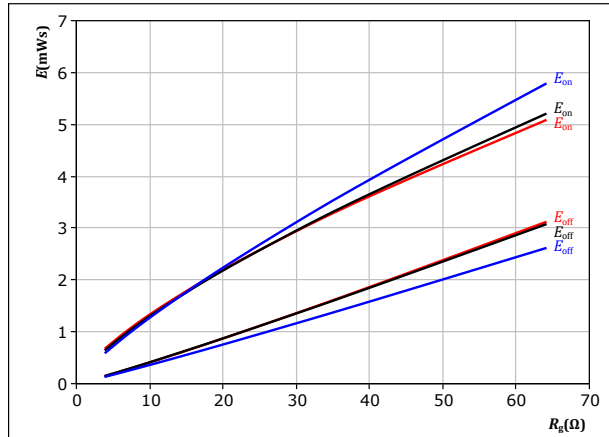
$V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 4$ Ω

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

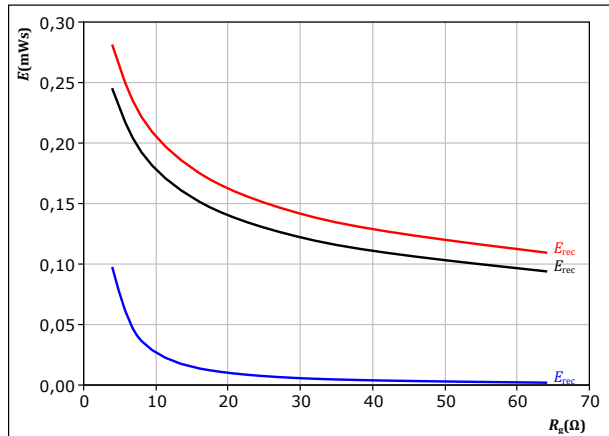
$V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 60$ A

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
 $I_D = 60$ A

T_j : 25 °C
125 °C
150 °C



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Inverter Switching Characteristics

figure 12.

MOSFET

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

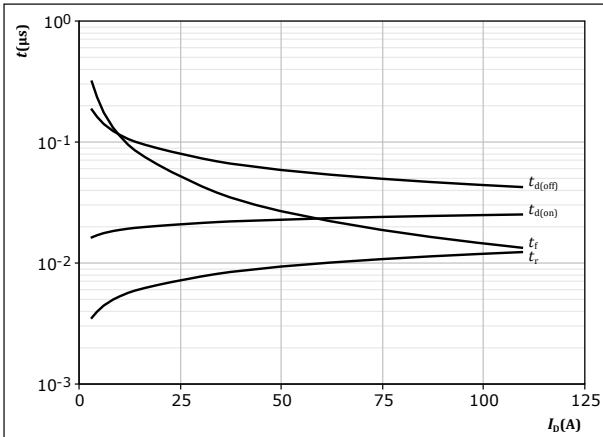


figure 13.

MOSFET

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

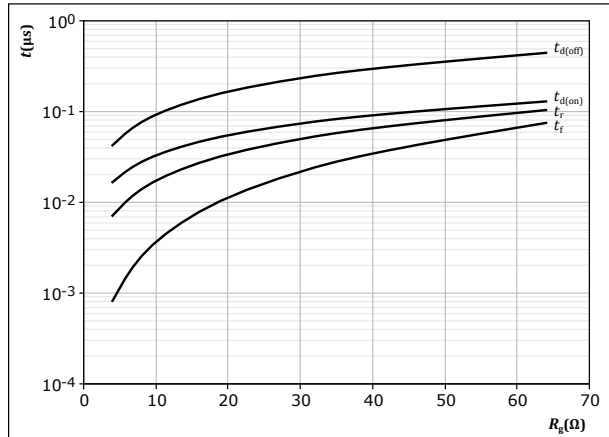


figure 14.

MOSFET

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

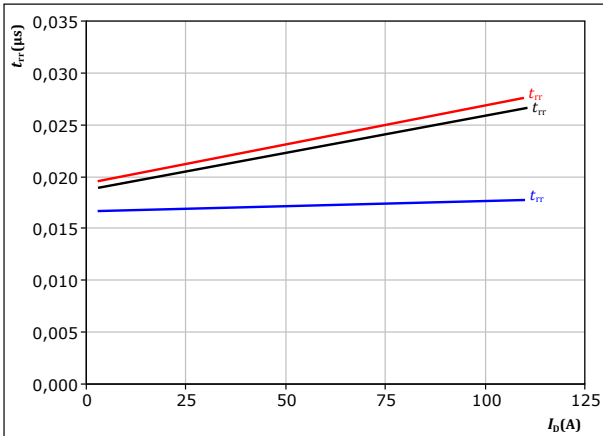
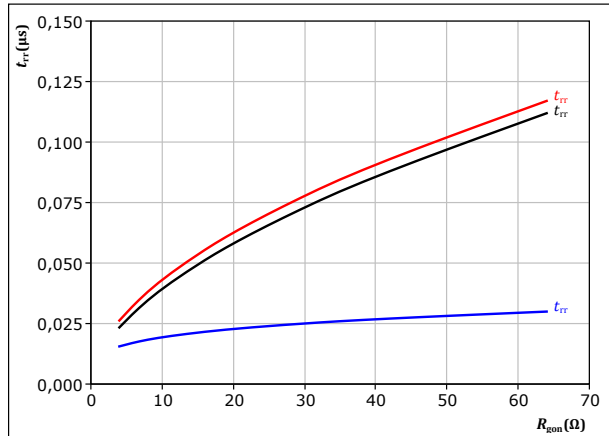


figure 15.

MOSFET

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





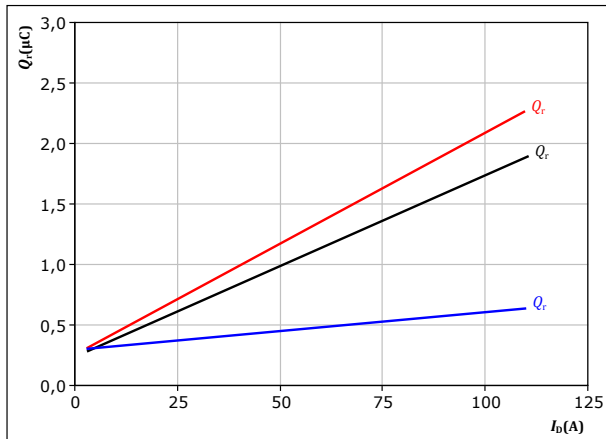
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Inverter Switching Characteristics

figure 16. MOSFET

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$

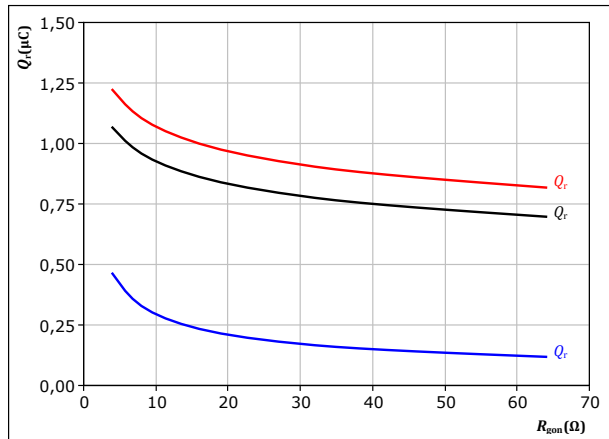


At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 4$ Ω
 T_j : 25 °C
125 °C
150 °C

figure 17. MOSFET

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

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

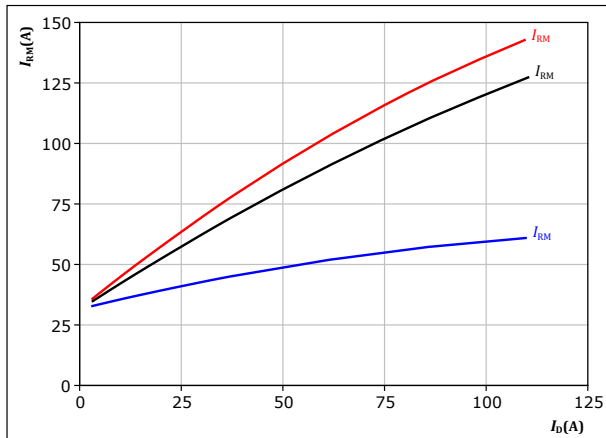


At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 60$ A
 T_j : 25 °C
125 °C
150 °C

figure 18. MOSFET

Typical peak reverse recovery current as a function of drain current

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

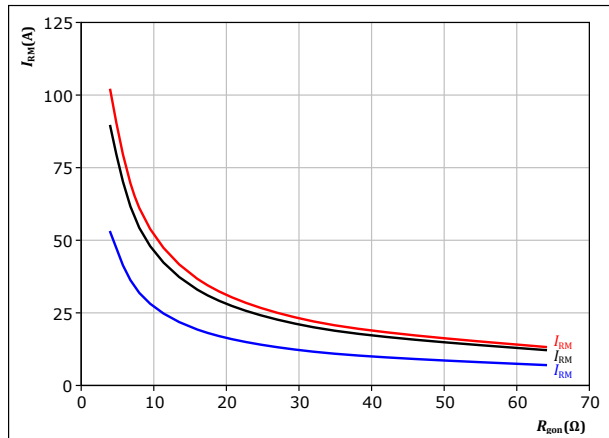


At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 4$ Ω
 T_j : 25 °C
125 °C
150 °C

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
 $I_D = 60$ A
 T_j : 25 °C
125 °C
150 °C



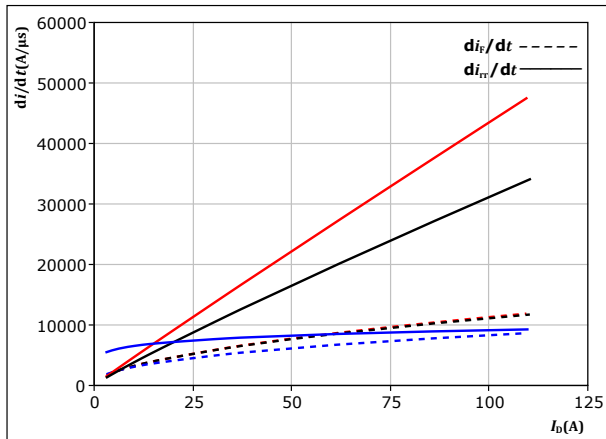
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Inverter Switching Characteristics

figure 20. MOSFET

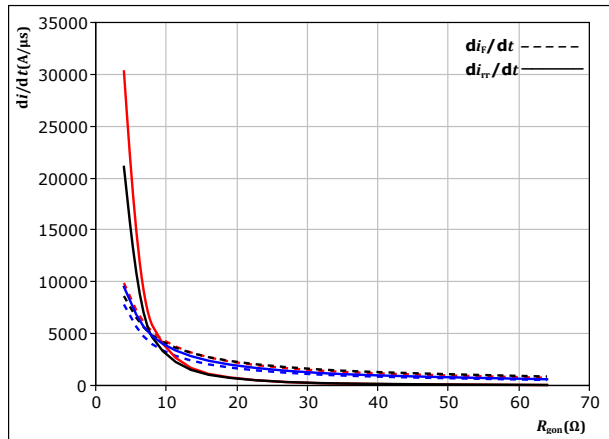
Typical rate of fall of forward and reverse recovery current as a function of drain current
 $di_f/dt, di_r/dt = f(I_D)$



At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $R_{gon} = 4$ Ω
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 21. MOSFET

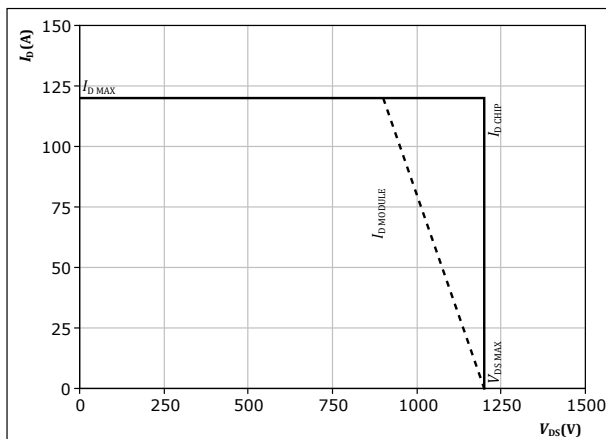
Typical rate of fall of forward and reverse recovery current as a function of turn on gate resistor
 $di_f/dt, di_r/dt = f(R_{gon})$



At $V_{DS} = 600$ V
 $V_{GS} = -5/18$ V
 $I_D = 60$ A
 T_j : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 22. MOSFET

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



At $T_j = 150$ °C
 $R_{gon} = 4$ Ω
 $R_{goff} = 4$ Ω



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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})

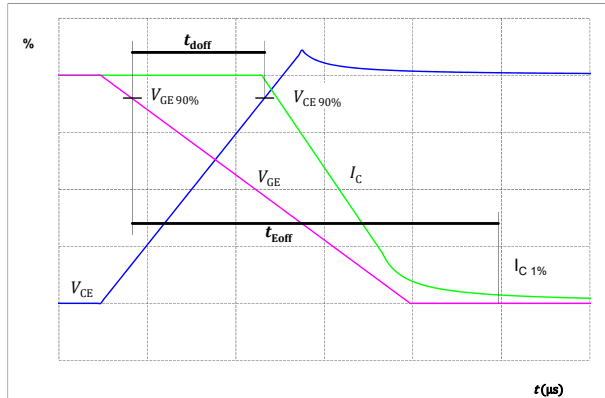


figure 24. MOSFET

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

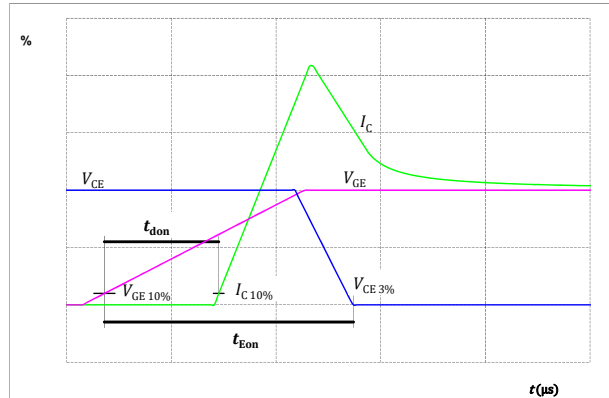


figure 25. MOSFET

Turn-off Switching Waveforms & definition of t_f

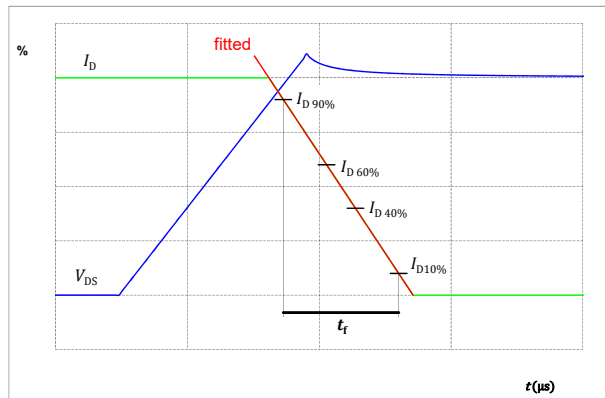
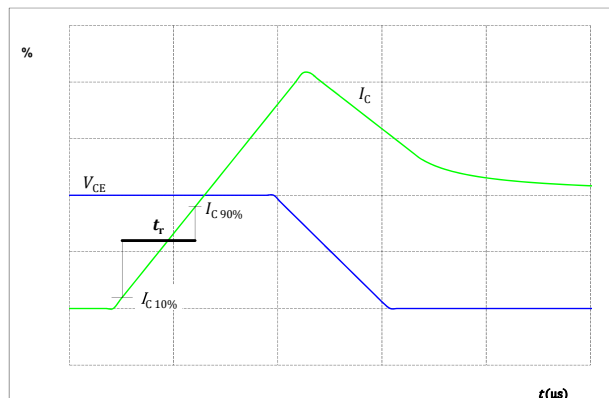


figure 26. MOSFET

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}

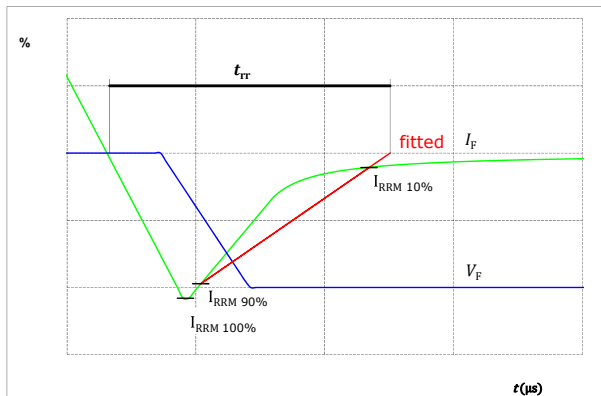


figure 28. FWD

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

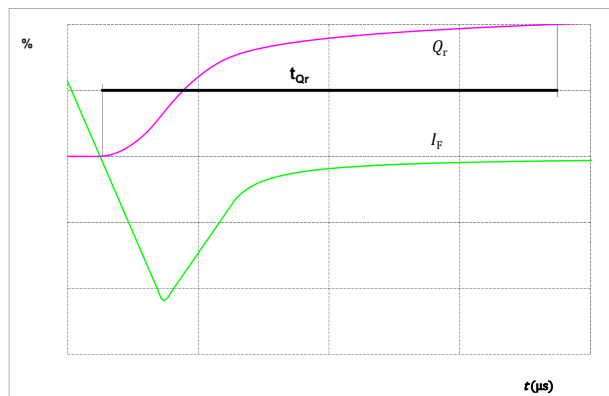
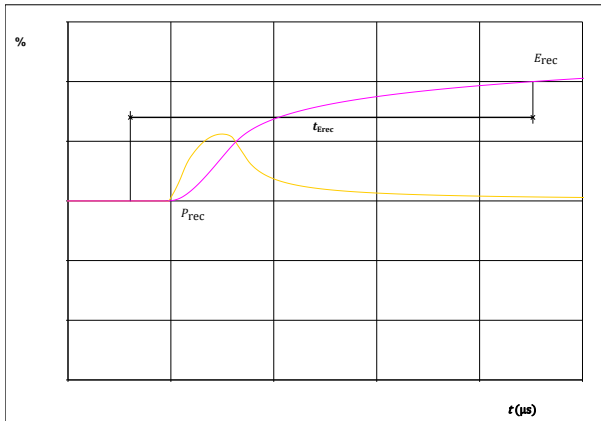


figure 29. FWD

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





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datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	10-EZ122PA020MS-LJ66F78T
With thermal paste (5,2 W/mK, PTM6000HV)	10-EZ122PA020MS-LJ66F78T-/7/

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	

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

Outline

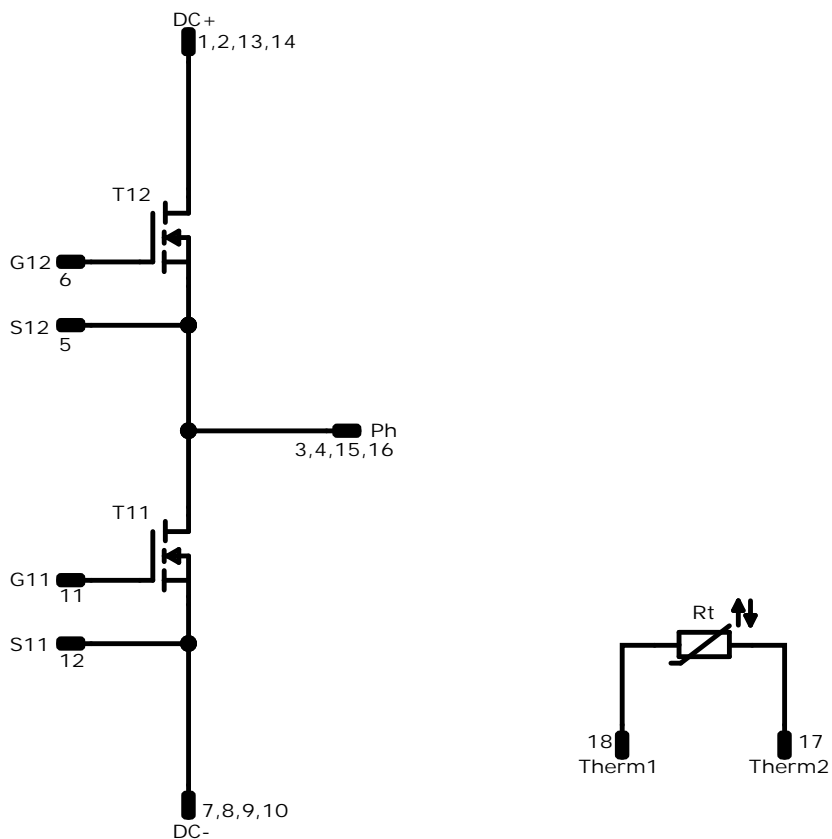
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datasheet

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12	MOSFET	1200 V	20 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-EZ122PA020MS-LJ66F78T-D1-14	9 Apr. 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.