10-EZ126PB032ME-LS18F08T

datasheet

*flow*PACK E1 SiC | 1200 V / 32 mΩ

Topology features

- 3ph Inverter
- Low and high side Kelvin Emitter for improved switching performance
- Open Emitter configuration
- Temperature sensor

flow E1 12 mm housing

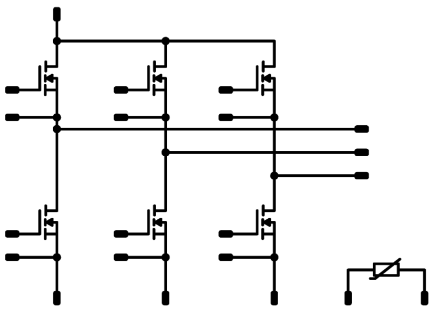
Component features

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

Housing features

- Base isolation: Al_2O_3
- 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

Schematic



Target applications

- Charging Stations
- Elevator Drives
- Embedded Drives
- Servo Drives

Types

- 10-EZ126PB032ME-LS18F08T

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Inverter Switch					
Drain-source voltage	V_{DSS}			1200	V
Drain current (DC current)	I_D	$T_j = T_{jmax}$	T_s = 80 °C	39	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}		120	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	74	W
Gate-source voltage	V_{GSS}			-4 / 15	V
		dynamic		-8 / 19	
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	6000	V
Creepage distance				>12,7	mm
Clearance				8,74	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	
Inverter Switch										
Static										
Drain-source on-state resistance	$r_{DS(on)}$		15		40	25 125 150	22,4	31,2 41,5 46,3	41,6(1)	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$			0,0115	25	1,8	2,5	3,6	V
Gate to Source Leakage Current	I_{GSS}		15	0		25		10	250	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1200		25		1	19	µA
Internal gate resistance	r_g							1,7		Ω
Gate charge	Q_g		-4/15	800	40	25		118		nC
Short-circuit input capacitance	C_{iss}	f = 100 kHz	0	1000	0	25		3357		pF
Short-circuit output capacitance	C_{oss}							129		
Reverse transfer capacitance	C_{rss}							8		
Diode forward voltage	V_{SD}		0		20	25		4,6		V
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,28		K/W

Characteristic Values

Parameter	Symbol	Conditions	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	Unit
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 8 Ω R_{goff} = 8 Ω	-4/15	600	30	25 125 150		25,88 23,53 23,25		ns
Rise time	t_r	R_{gon} = 8 Ω R_{goff} = 8 Ω	-4/15	600	30	25 125 150		9,13 8,45 8,27		ns
Turn-off delay time	$t_{d(off)}$	R_{gon} = 8 Ω R_{goff} = 8 Ω	-4/15	600	30	25 125 150		61,73 68,82 70,31		ns
Fall time	t_f	R_{gon} = 8 Ω R_{goff} = 8 Ω	-4/15	600	30	25 125 150		16,81 17,44 18,37		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,223 µC Q_{rFWD}=0,49 µC Q_{rFWD}=0,609 µC	-4/15	600	30	25 125 150		0,32 0,362 0,388		mWs
Turn-off energy (per pulse)	E_{off}		-4/15	600	30	25 125 150		0,131 0,131 0,132		mWs
Peak recovery current	I_{RRM}	d*i*/d*t*=3997 A/µs d*i*/d*t*=4663 A/µs d*i*/d*t*=4786 A/µs	-4/15	600	30	25 125 150		29,71 41,88 47,97		A
Reverse recovery time	t_{rr}	d*i*/d*t*=3997 A/µs d*i*/d*t*=4663 A/µs d*i*/d*t*=4786 A/µs	-4/15	600	30	25 125 150		12,9 18,87 19,88		ns
Recovered charge	Q_r	d*i*/d*t*=3997 A/µs d*i*/d*t*=4663 A/µs d*i*/d*t*=4786 A/µs	-4/15	600	30	25 125 150		0,223 0,49 0,609		µC
Reverse recovered energy	E_{rec}	d*i*/d*t*=3997 A/µs d*i*/d*t*=4663 A/µs d*i*/d*t*=4786 A/µs	-4/15	600	30	25 125 150		0,052 0,159 0,211		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$	d*i*/d*t*=3997 A/µs d*i*/d*t*=4663 A/µs d*i*/d*t*=4786 A/µs	-4/15	600	30	25 125 150		6325,32 4793,08 6259,29		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

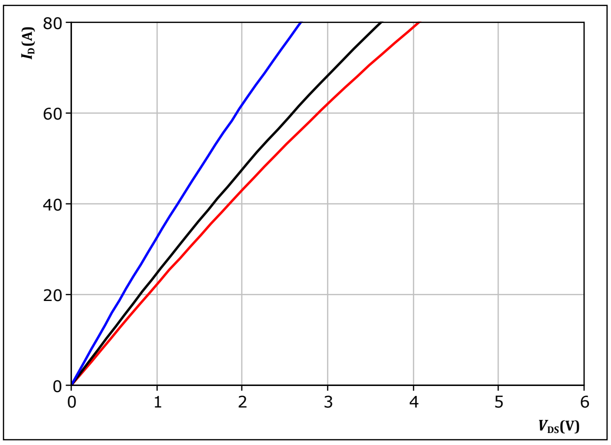
(2) Only valid with pre-applied Vincotech thermal interface material.

Inverter Switch Characteristics

figure 1. **MOSFET**

Typical output characteristics

I_D = f(V_{DS})

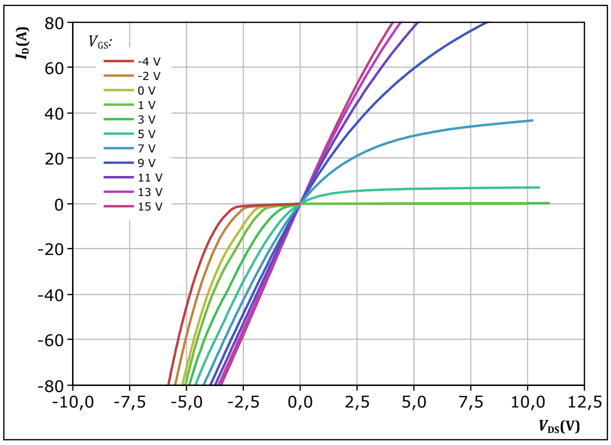


t_p = 250 µs
V_{GS} = 15 V
T_j: 25 °C, 125 °C, 150 °C

figure 2. **MOSFET**

Typical output characteristics

I_D = f(V_{DS})

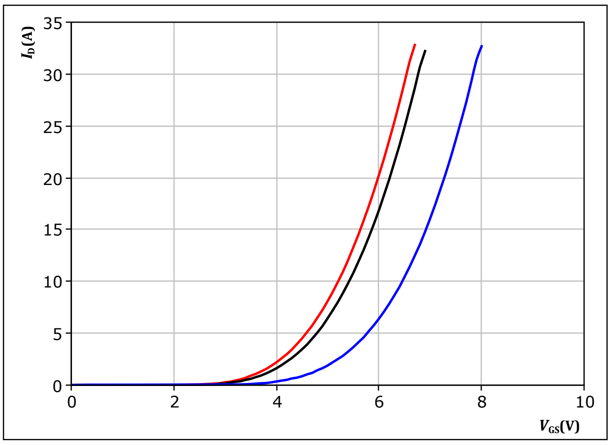


t_p = 250 µs
T_j = 150 °C
V_{GS} from -4 V to 15 V in steps of 2 V

figure 3. **MOSFET**

Typical transfer characteristics

I_D = f(V_{GS})

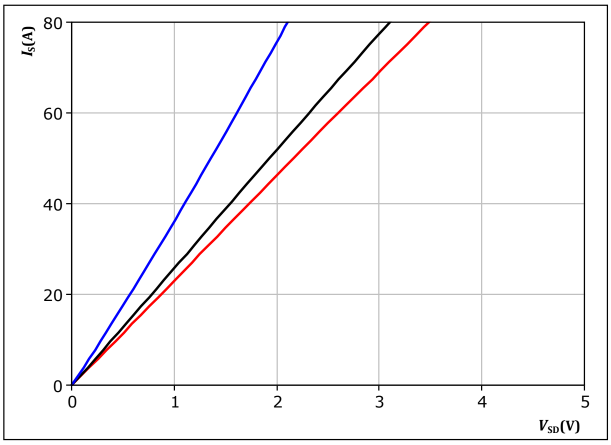


t_p = 250 µs
V_{DS} = 10 V
T_j: 25 °C, 125 °C, 150 °C

figure 4. **MOSFET**

Typical reverse drain current characteristics

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



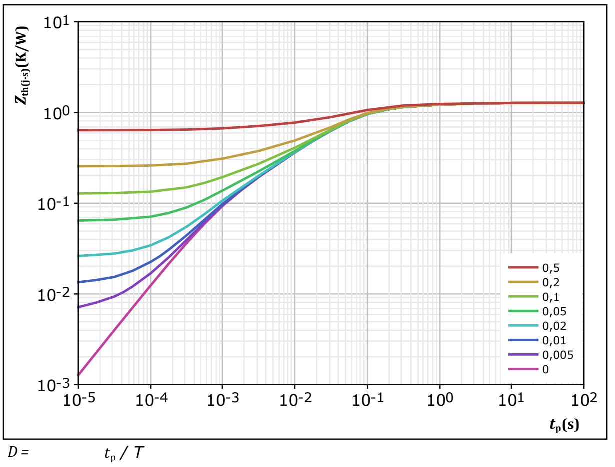
t_p = 250 µs
V_{GS} = 15 V
T_j: 25 °C, 125 °C, 150 °C

Inverter Switch Characteristics

figure 5. **MOSFET**

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

$R_{th(j-s)} =$ 1,276 K/W

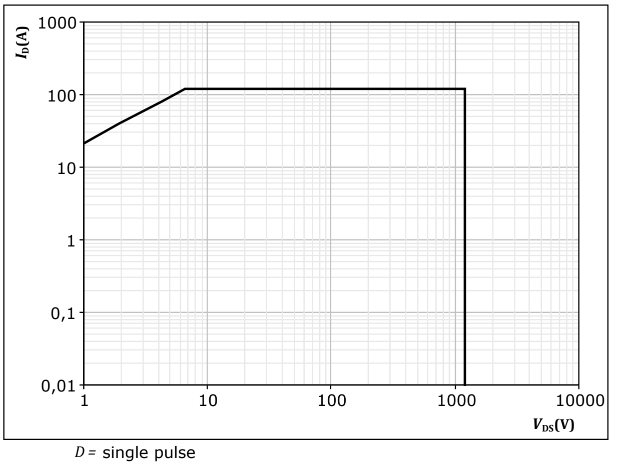
MOSFET thermal model values

R (K/W)	τ (s)
6,59E-02	2,75E+00
1,80E-01	3,21E-01
7,28E-01	5,55E-02
2,13E-01	8,37E-03
8,96E-02	1,01E-03

figure 6. **MOSFET**

Safe operating area

$I_D = f(V_{DS})$



$D =$ single pulse

$T_s =$ 80 °C

$V_{GS} =$ 15 V

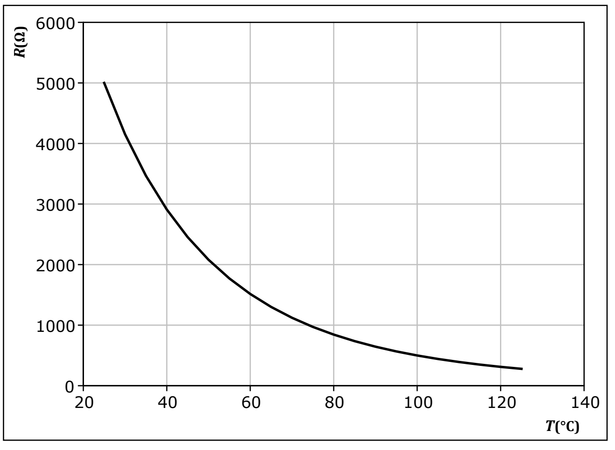
$T_j = T_{jmax}$

Thermistor Characteristics

figure 7.	Thermistor

Typical NTC characteristic as function of temperature

R_T = f(T)

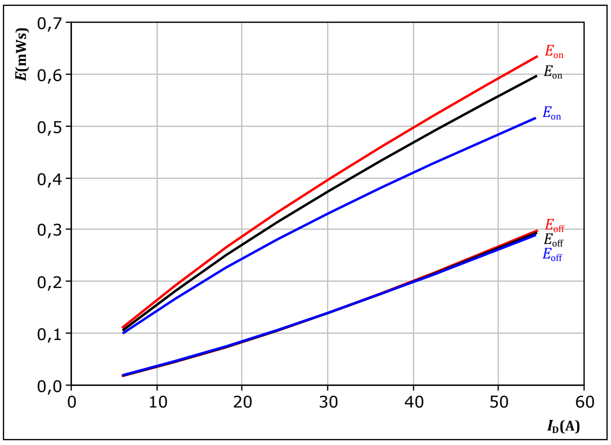


Inverter Switching Characteristics

figure 8. **MOSFET**

Typical switching energy losses as a function of drain current

E = f(I_D)



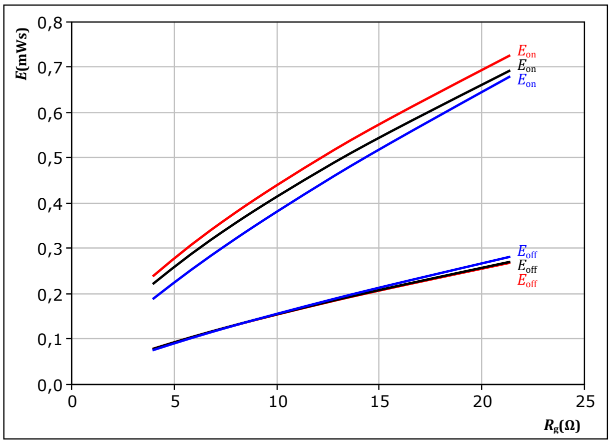
With an inductive load at

			T_j:
V_{DS} =	600	V	25 °C
V_{GS} =	-4/15	V	125 °C
R_{gon} =	8	Ω	150 °C
R_{goff} =	8	Ω	

figure 9. **MOSFET**

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

E = f(R_g)



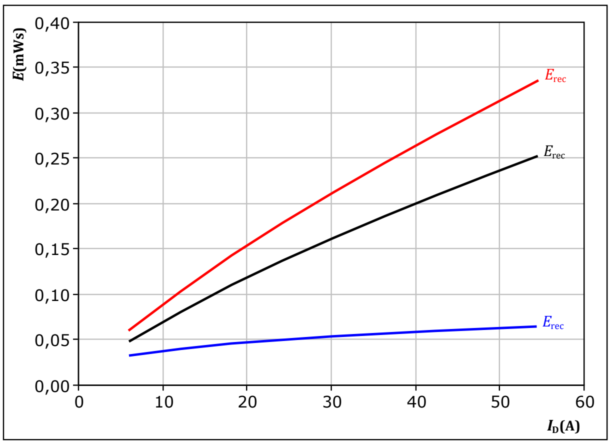
With an inductive load at

			T_j:
V_{DS} =	600	V	25 °C
V_{GS} =	-4/15	V	125 °C
I_D =	30	A	150 °C

figure 10. **MOSFET**

Typical reverse recovered energy loss as a function of drain current

E_{rec} = f(I_D)



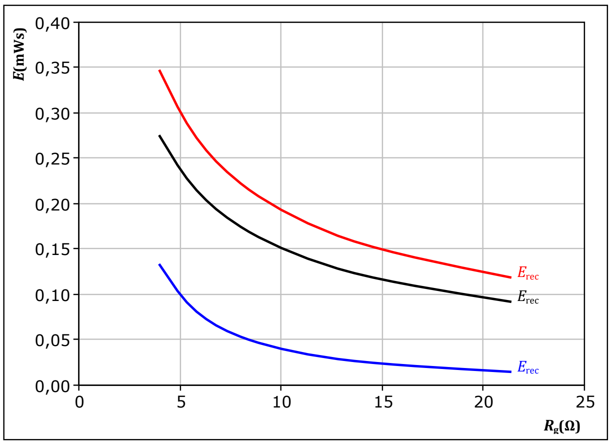
With an inductive load at

			T_j:
V_{DS} =	600	V	25 °C
V_{GS} =	-4/15	V	125 °C
R_{gon} =	8	Ω	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

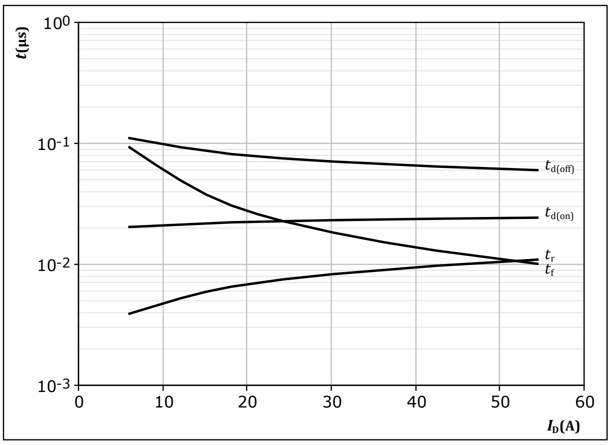
			T_j:
V_{DS} =	600	V	25 °C
V_{GS} =	-4/15	V	125 °C
I_D =	30	A	150 °C

Inverter Switching Characteristics

figure 12. **MOSFET**

Typical switching times as a function of drain current

t = f(I_D)



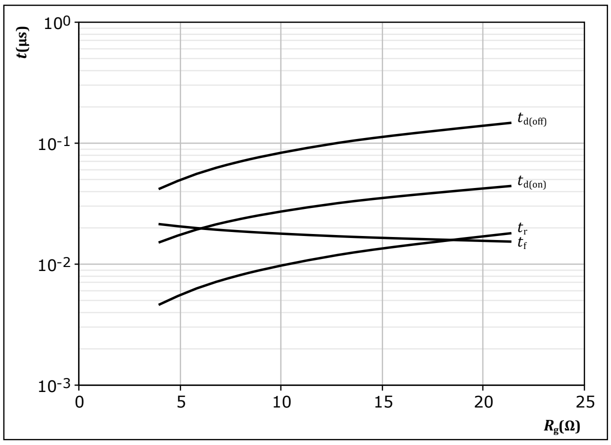
With an inductive load at

T_j =	150	°C
V_{DS} =	600	V
V_{GS} =	-4/15	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)



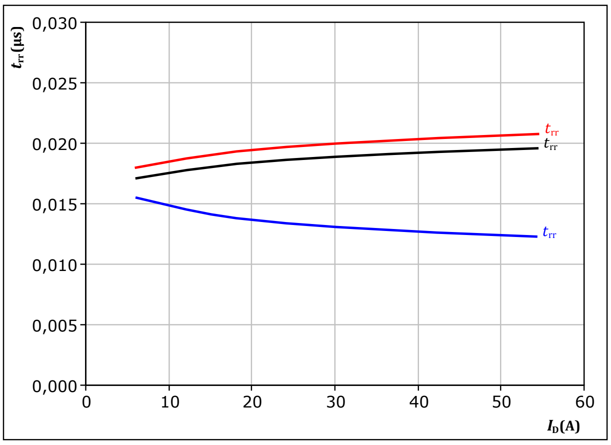
With an inductive load at

T_j =	150	°C
V_{DS} =	600	V
V_{GS} =	-4/15	V
I_D =	30	A

figure 14. **MOSFET**

Typical reverse recovery time as a function of drain current

t_{rr} = f(I_D)



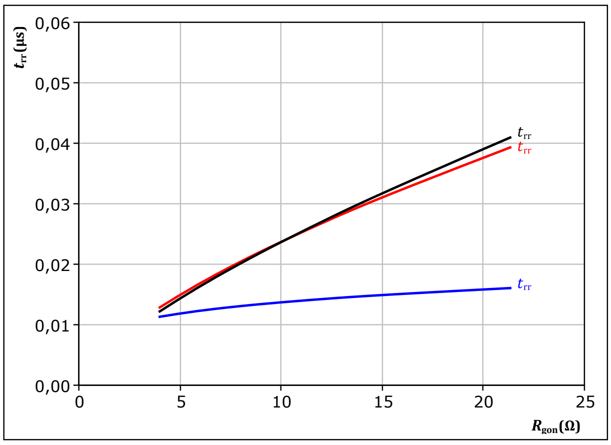
At			
V_{DS} =	600	V	
V_{GS} =	-4/15	V	
R_{gon} =	8	Ω	

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} =	-4/15	V
I_D =	30	A

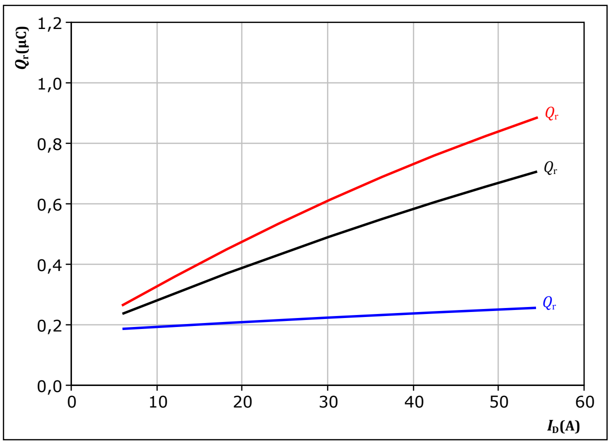
T_j: 25 °C, 125 °C, 150 °C

Inverter Switching Characteristics

figure 16. **MOSFET**

Typical recovered charge as a function of drain current

Q_r = f(I_D)

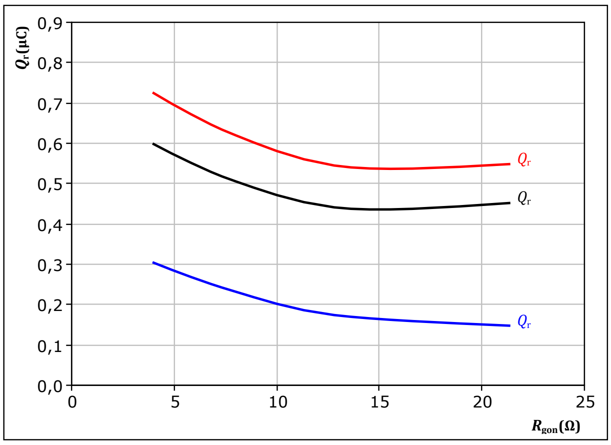


At				
	V_{DS} =	600	V	T_j: 25 °C
	V_{GS} =	-4/15	V	125 °C
	R_{gon} =	8	Ω	150 °C

figure 17. **MOSFET**

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

Q_r = f(R_{gon})

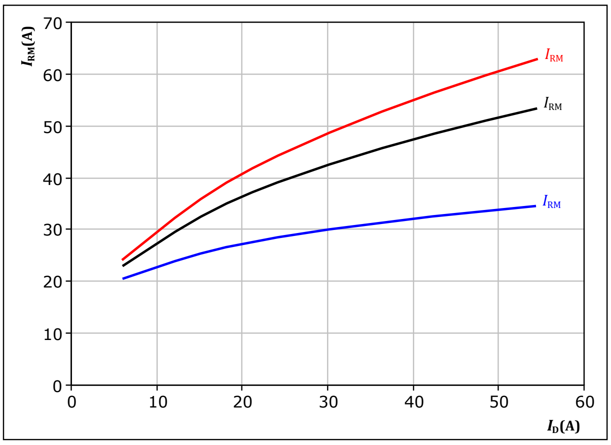


At				
	V_{DS} =	600	V	T_j: 25 °C
	V_{GS} =	-4/15	V	125 °C
	I_D =	30	A	150 °C

figure 18. **MOSFET**

Typical peak reverse recovery current as a function of drain current

I_{RM} = f(I_D)

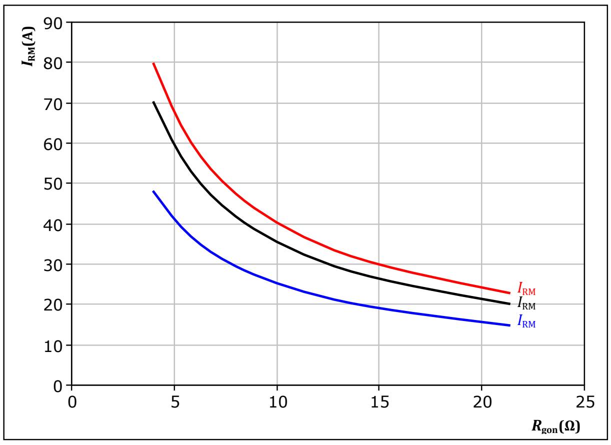


At				
	V_{DS} =	600	V	T_j: 25 °C
	V_{GS} =	-4/15	V	125 °C
	R_{gon} =	8	Ω	150 °C

figure 19. **MOSFET**

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

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



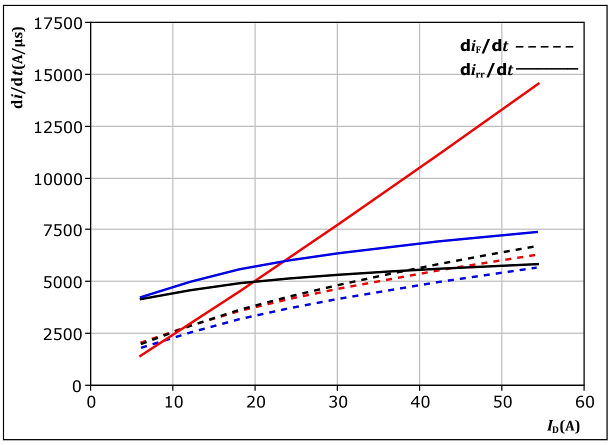
At				
	V_{DS} =	600	V	T_j: 25 °C
	V_{GS} =	-4/15	V	125 °C
	I_D =	30	A	150 °C

Inverter Switching Characteristics

figure 20. **MOSFET**

Typical rate of fall of forward and reverse recovery current as a function of drain current

di_F/dt, di_{rr}/dt = f(I_D)

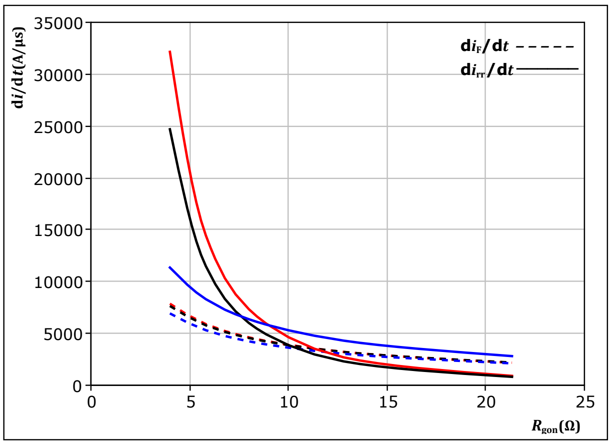


At	V_{DS} =	600	V		
	V_{GS} =	-4/15	V	T_j:	25 °C / 125 °C / 150 °C
	R_{gon} =	8	Ω		

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

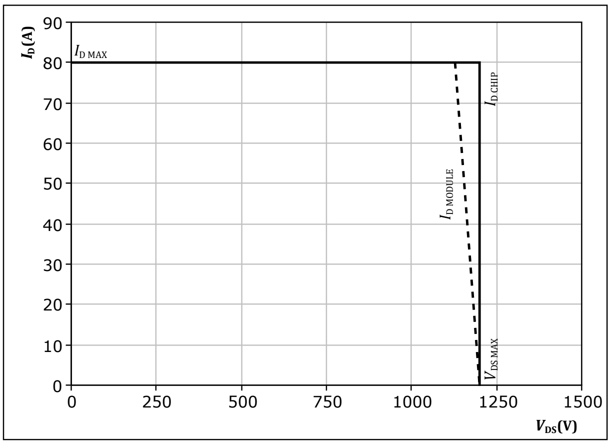


At	V_{DS} =	600	V		
	V_{GS} =	-4/15	V	T_j:	25 °C / 125 °C / 150 °C
	I_D =	30	A		

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

Inverter Switching Definitions

figure 23. **MOSFET**

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

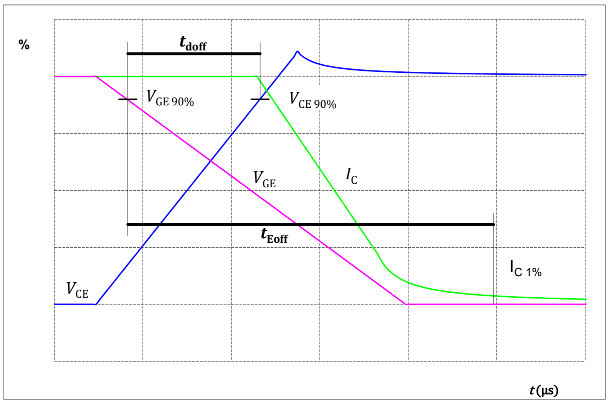


figure 24. **MOSFET**

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

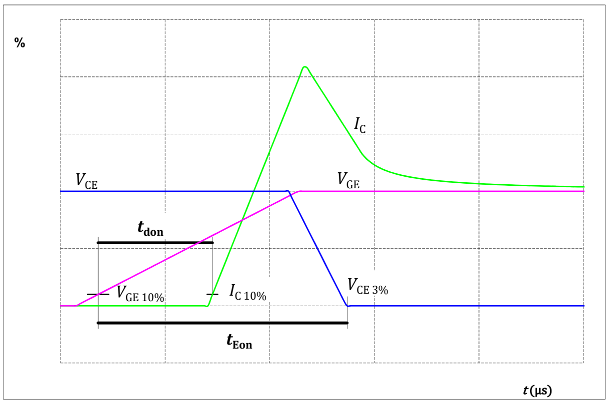


figure 25. **MOSFET**

Turn-off Switching Waveforms & definition of t_f

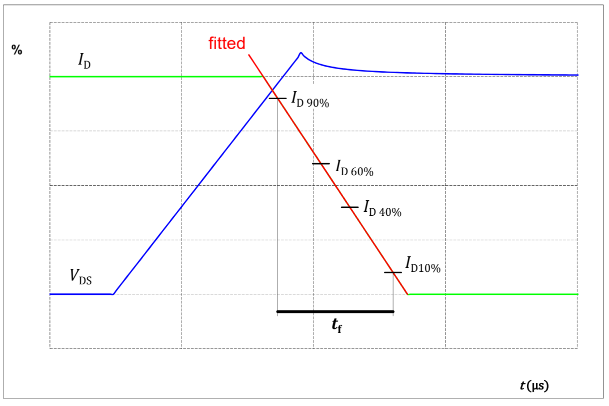
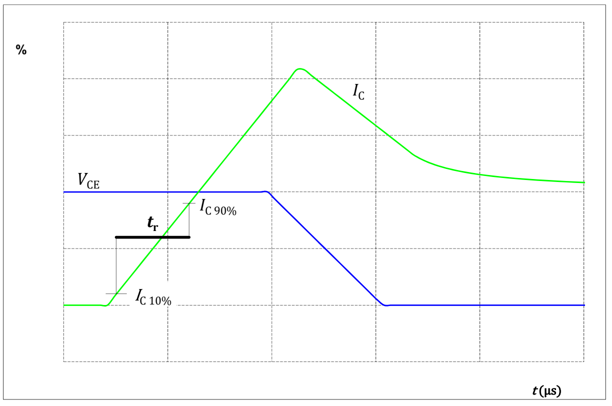


figure 26. **MOSFET**

Turn-on Switching Waveforms & definition of t_r



Inverter Switching Definitions

figure 27. **FWD**

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

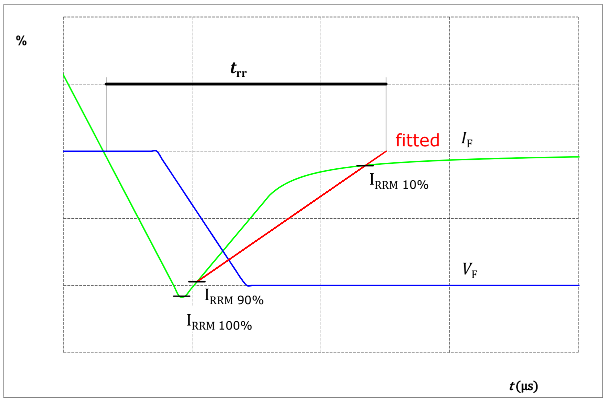


figure 28. **FWD**

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

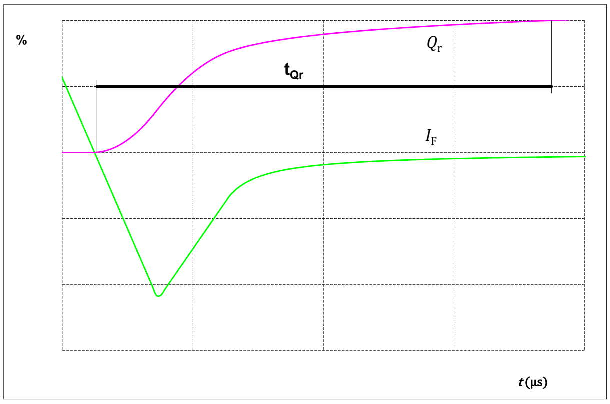
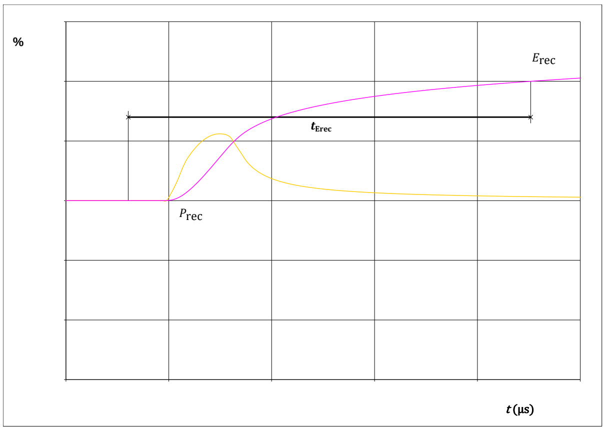


figure 29. **FWD**

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



10-EZ126PB032ME-LS18F08T

datasheet

Ordering Code

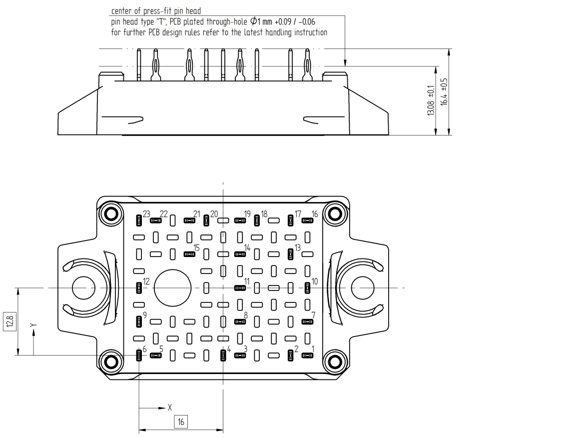
Version	Ordering Code
Without thermal paste	10-EZ126PB032ME-LS18F08T
With thermal paste (5,2 W/mK, PTM6000HV)	10-EZ126PB032ME-LS18F08T-/7/
With thermal paste (3,4 W/mK, PSX-P7)	10-EZ126PB032ME-LS18F08T-/3/

Marking

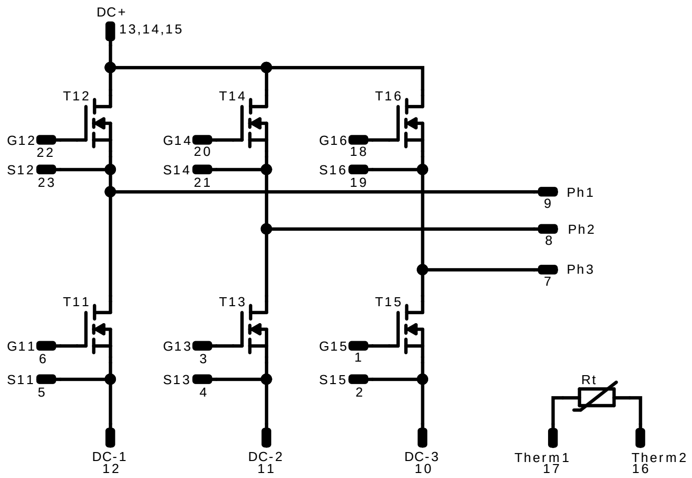
	**Text**	**Name**		**Date code**	**UL & VIN**	**Lot**	**Serial**
		NN-NNNNNNNNNNNNNN-TTTTTTVV		WWYY	UL VIN	LLLLL	SSSS
	Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
		TTTTTTTVV	LLLLL	SSSS	WWYY		

Outline

Pin table [mm]			
Pin	X	Y	Function
1	32	0	G15
2	28,8	0	S15
3	19,2	0	G13
4	16	0	S13
5	3,2	0	S11
6	0	0	G11
7	32	6,4	Ph3
8	19,2	6,4	Ph2
9	0	6,4	Ph1
10	32	12,8	DC-3
11	19,2	12,8	DC-2
12	0	12,8	DC-1
13	28,8	19,2	DC+
14	19,2	19,2	DC+
15	9,6	19,2	DC+
16	32	25,6	Therm2
17	28,8	25,6	Therm1
18	22,4	25,6	G16
19	19,2	25,6	S16
20	12,8	25,6	G14
21	9,6	25,6	S14
22	3,2	25,6	G12
23	0	25,6	S12



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14, T15, T16	MOSFET	1200 V	32 mΩ	Inverter Switch	
Rt	Thermistor			Thermistor	

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

Handling instruction
Handling instructions for *flow* E1 packages see vincotech.com website.

Package data
Package data for *flow* 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 $T_{j,op}$=175°C and up to 3500VAC/1min isolation voltage. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
10-EZ126PB032ME-LS18F08T-D2-14	26 Mar. 2024	Updated static characteristic Update of Ordering Codes	