



Vincotech

# 10-PZ126PA075ME-M909F38Y

datasheet

flowPACK 0 SiC

1200 V / 75 mΩ

## Topology features

- 3xHalf Bridge
- Open Emitter configuration
- Kelvin Emitter for improved switching performance
- Integrated DC capacitor
- Split output for transient deactivation of the body diode and elimination of X-conduction at fast turn-on
- Temperature sensor

## 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<sub>2</sub>O<sub>3</sub>
- Clip-in, reliable mechanical connection, qualified for wave soldering
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief
- Press-fit pin
- Reliable cold welding connection

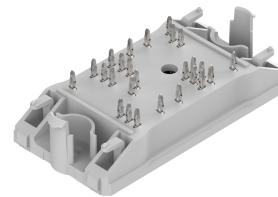
## Target applications

- Power Supply
- Solar Inverters

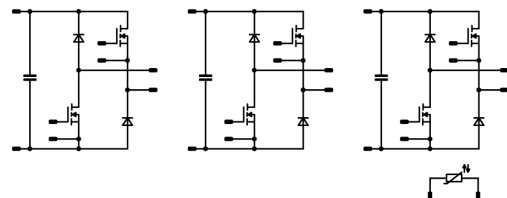
## Types

- 10-PZ126PA075ME-M909F38Y

## flow 0 12 mm housing



## Schematic





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## Maximum Ratings

$T_j = 25\text{ °C}$ , unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
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### Inverter Switch

Drain-source voltage	$V_{DS}$		1200	V
Drain current (DC current)	$I_D$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	21	A
Peak drain current	$I_{DM}$	$t_p$ limited by $T_{jmax}$	80	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	52	W
Gate-source voltage	$V_{GS}$	static	-4 / 15	V
		dynamic	-8 / 19	V
Maximum Junction Temperature	$T_{jmax}$		175	°C

### Inverter Diode

Peak repetitive reverse voltage	$V_{RRM}$		1200	V
Forward current (DC current)	$I_F$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	19	A
Repetitive peak forward current	$I_{FRM}$	$t_p$ limited by $T_{jmax}$	53	A
Surge (non-repetitive) forward current	$I_{FSM}$	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 110\text{ °C}$	81	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	45	W
Maximum junction temperature	$T_{jmax}$		175	°C

### Capacitor (DC)

Maximum DC voltage	$V_{MAX}$		1000	V
Operation Temperature	$T_{op}$		0 ... 125	°C



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## Maximum Ratings

$T_j = 25\text{ °C}$ , unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
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## Module Properties

### Thermal Properties

Storage temperature	$T_{\text{stg}}$		-40...+125	°C
Operation temperature under switching condition	$T_{\text{jop}}$		-40...+( $T_{\text{jmax}}$ - 25)	°C

### Isolation Properties

Isolation voltage	$V_{\text{isol}}$	DC Test Voltage* $t_p = 2\text{ s}$	6000	V
Creepage distance			>12,7	mm
Clearance			10,19	mm
Comparative Tracking Index	CTI		≥ 200	

\*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 <sup>(1)</sup>	$r_{DS(on)}$		15		20	25 175		75 115	90	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$			0,005	25	1,7	2,5	4	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	100	μA
Internal gate resistance	$r_g$							10,5		Ω
Gate charge	$Q_g$		-4/15	800	20	25		54		nC
Short-circuit input capacitance	$C_{iss}$	$f = 1 \text{ Mhz}$	0	1000	0	25		1350		pF
Short-circuit output capacitance	$C_{oss}$							58		
Reverse transfer capacitance	$C_{rss}$							3		
Diode forward voltage	$V_{SD}$		0		10	25		4,5		V

#### Thermal

Thermal resistance junction to sink <sup>(2)</sup>	$R_{th(j-s)}$	$\lambda_{paste} = 3,4 \text{ W/mK}$ (PSX)						1,84		K/W
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#### Dynamic

Turn-on delay time	$t_{d(on)}$	$R_{gon} = 16 \text{ Ω}$ $R_{goff} = 16 \text{ Ω}$	-4/15	600	15	25 125 150		21,8 19,26 19,3		ns
Rise time	$t_r$					25 125 150		14,64 13,83 13,29		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		84,4 93,04 95,17		ns
Fall time	$t_f$					25 125 150		21,38 23,72 22,71		ns
Turn-on energy (per pulse)	$E_{on}$					25 125 150		0,262 0,244 0,242		mWs
Turn-off energy (per pulse)	$E_{off}$					25 125 150		0,081 0,08 0,083		mWs



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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 Diode

#### Static

Forward voltage	$V_F$				10	25 125 150		1,3 1,47 1,54	1,8 <sup>(1)</sup>	V
Reverse leakage current	$I_R$	$V_i = 1200$ V				25		2,8	500	µA

#### Thermal

Thermal resistance junction to sink <sup>(2)</sup>	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						2,12		K/W
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#### Dynamic

Peak recovery current	$I_{RM}$	$di/dt=1350$ A/µs $di/dt=1270$ A/µs $di/dt=1158$ A/µs	-4/15	600	15	25 125 150		8,78 9,57 9,72		A
Reverse recovery time	$t_{rr}$					25 125 150		32,27 30,66 30,52		ns
Recovered charge	$Q_r$					25 125 150		0,149 0,154 0,156		µC
Reverse recovered energy	$E_{rec}$					25 125 150		0,041 0,043 0,044		mWs
Peak rate of fall of recovery current	$(di_{rr}/dt)_{max}$					25 125 150		835,53 967,09 975,93		A/µs



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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	

**Capacitor (DC)**

**Static**

Capacitance	$C$	DC bias voltage = 0 V				25		47		nF
Tolerance							-10		10	%

**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	

<sup>(1)</sup> Value at chip level

<sup>(2)</sup> Only valid with pre-applied Vincotech thermal interface material.



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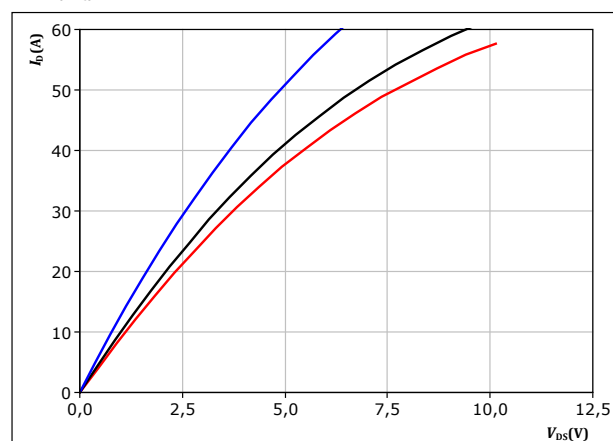
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## Inverter Switch Characteristics

figure 1. MOSFET

Typical output characteristics including  $R_{DS(on)} + R_{DS(off)}$

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



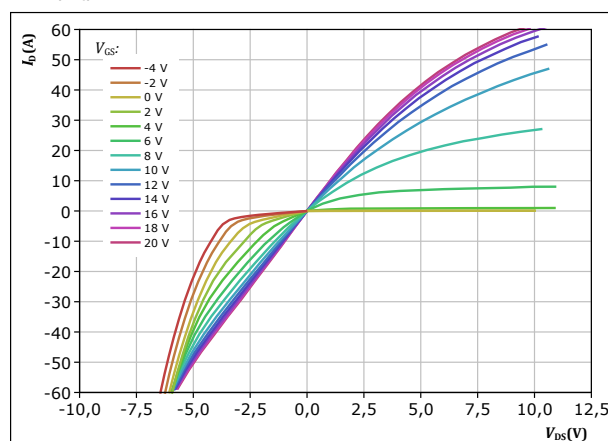
$t_p = 250 \mu s$   
 $V_{GS} = 14 V$

$T_j:$   
— 25 °C  
— 125 °C  
— 150 °C

figure 2. MOSFET

Typical output characteristics including  $R_{DS(on)} + R_{DS(off)}$

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

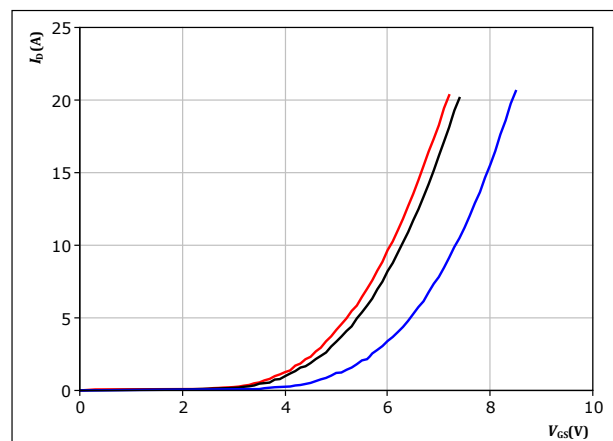


$t_p = 250 \mu s$   
 $T_j = 150 ^\circ C$   
 $V_{GS}$  from -4 V to 20 V in steps of 2 V

figure 3. MOSFET

Typical transfer characteristics

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



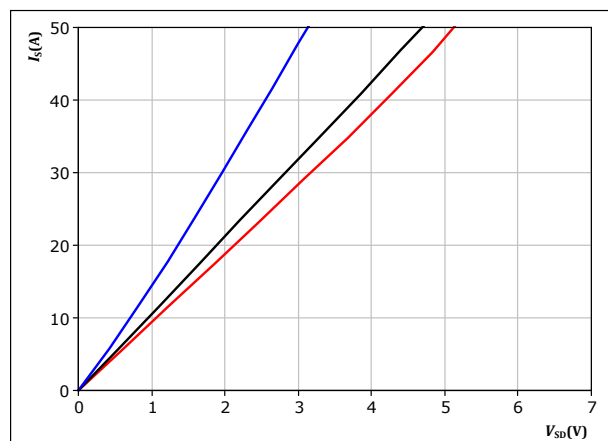
$t_p = 250 \mu s$   
 $V_{DS} = 10 V$

$T_j:$   
— 25 °C  
— 125 °C  
— 150 °C

figure 4. MOSFET

Typical reverse drain current characteristics including  $R_{DS(on)} + R_{DS(off)}$

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



$t_p = 250 \mu s$   
 $V_{GS} = 14 V$

$T_j:$   
— 25 °C  
— 125 °C  
— 150 °C

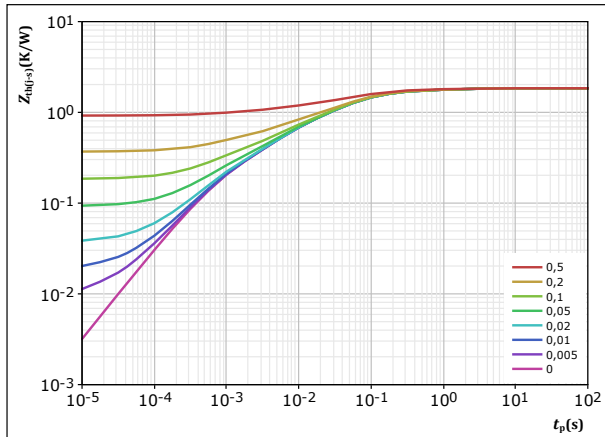


## Inverter Switch Characteristics

figure 5. MOSFET

Transient thermal impedance as a function of pulse width

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

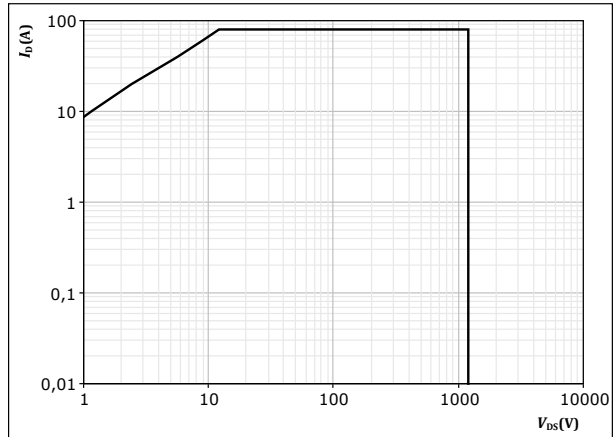


$D =$	$t_p / T$
$R_{th(j-a)} =$	1,843 K/W
MOSFET thermal model values	
$R$ (K/W)	$\tau$ (s)
1,10E-01	1,89E+00
4,15E-01	1,55E-01
7,53E-01	3,96E-02
4,02E-01	6,20E-03
1,64E-01	7,03E-04

figure 6. MOSFET

Safe operating area

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



$D =$	single pulse
$T_a =$	80 °C
$V_{GS} =$	14 V
$T_j =$	$T_{jmax}$





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## Inverter Diode Characteristics

figure 7.

FWD

Typical forward characteristics

$$I_F = f(V_F)$$

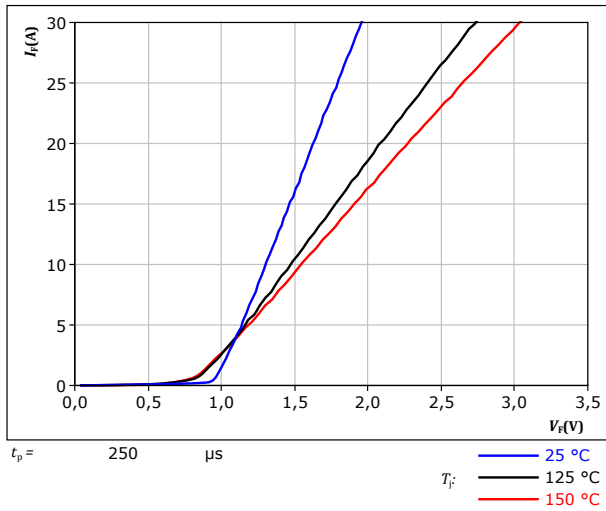
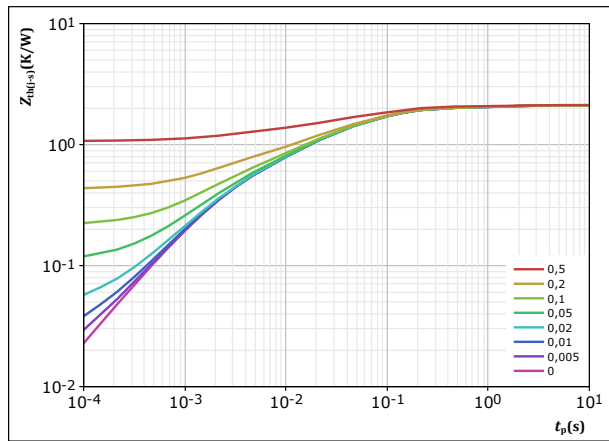


figure 8.

FWD

Transient thermal impedance as a function of pulse width

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



$D =$	$t_p / T$	
$R_{th(j-s)} =$	2,124	K/W
FWD thermal model values		
$R$ (K/W)	$\tau$ (s)	
2,40E-02	6,68E+01	
1,38E-01	1,29E+00	
9,33E-01	8,00E-02	
6,88E-01	1,52E-02	
3,52E-01	2,00E-03	



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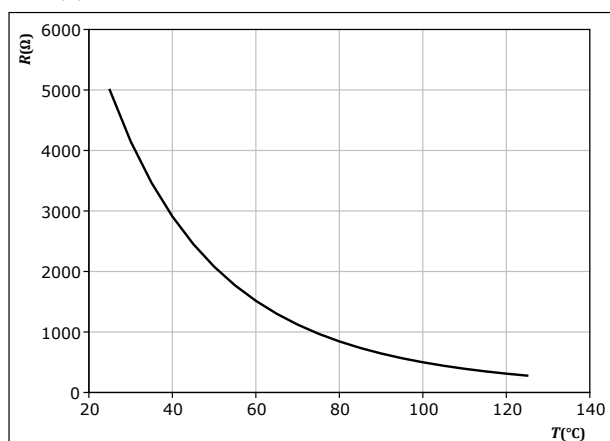
## Thermistor Characteristics

figure 9.

Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$





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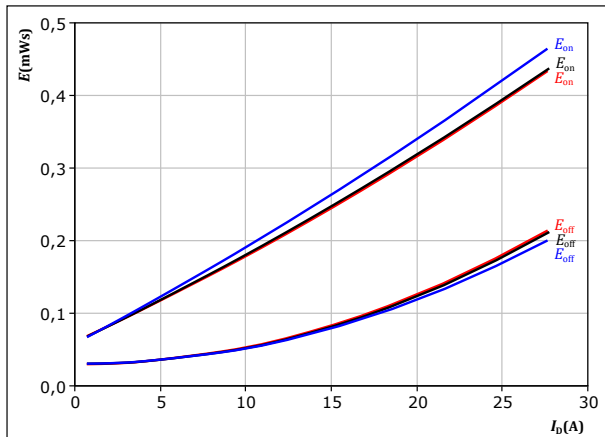
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## Inverter Switching Characteristics

figure 10. MOSFET

Typical switching energy losses as a function of drain current

$$E = f(I_D)$$



With an inductive load at

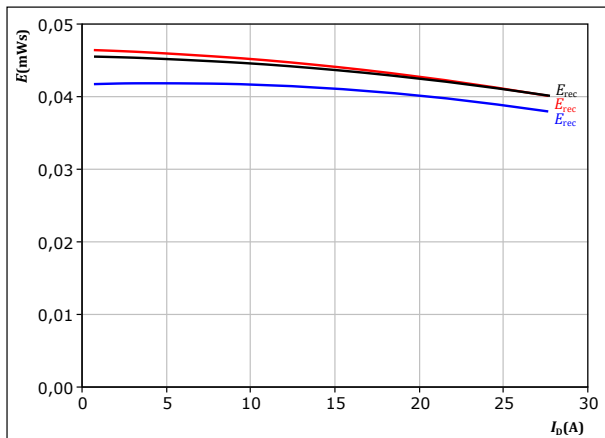
$V_{DS} = 600 \text{ V}$   
 $V_{GS} = -4/15 \text{ V}$   
 $R_{gon} = 16 \text{ } \Omega$   
 $R_{goff} = 16 \text{ } \Omega$

$T_j$ :  
— 25 °C  
— 125 °C  
— 150 °C

figure 12. FWD

Typical reverse recovered energy loss as a function of drain current

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



With an inductive load at

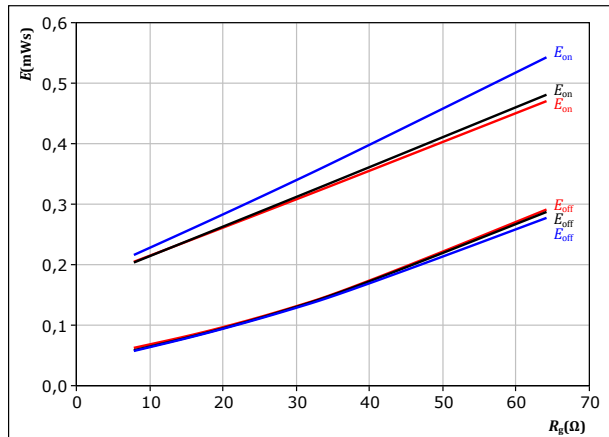
$V_{DS} = 600 \text{ V}$   
 $V_{GS} = -4/15 \text{ V}$   
 $R_{gon} = 16 \text{ } \Omega$

$T_j$ :  
— 25 °C  
— 125 °C  
— 150 °C

figure 11. MOSFET

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

$$E = f(R_g)$$



With an inductive load at

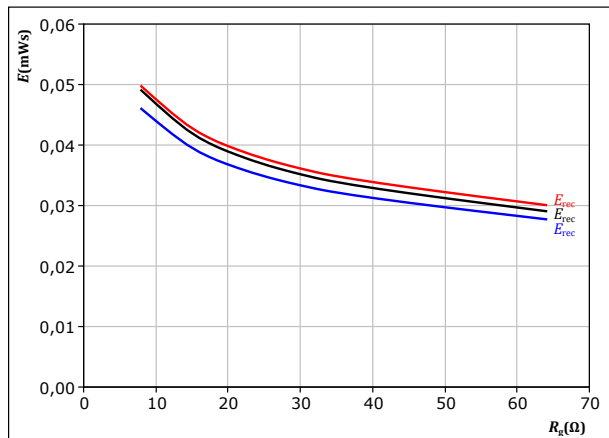
$V_{DS} = 600 \text{ V}$   
 $V_{GS} = -4/15 \text{ V}$   
 $I_D = 15 \text{ A}$

$T_j$ :  
— 25 °C  
— 125 °C  
— 150 °C

figure 13. FWD

Typical reverse recovered energy loss as a function of MOSFET turn on gate resistor

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



With an inductive load at

$V_{DS} = 600 \text{ V}$   
 $V_{GS} = -4/15 \text{ V}$   
 $I_D = 15 \text{ A}$

$T_j$ :  
— 25 °C  
— 125 °C  
— 150 °C



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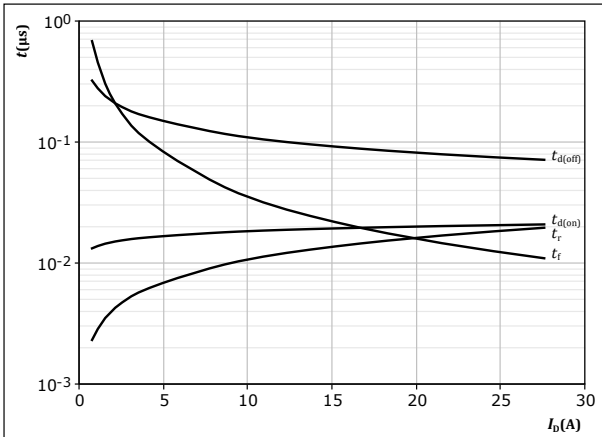
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datasheet

## Inverter Switching Characteristics

figure 14.

MOSFET

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

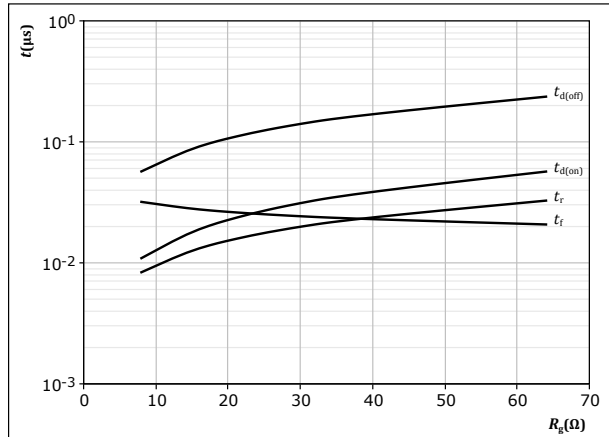


With an inductive load at  
 $T_j = 150$  °C  
 $V_{DS} = 600$  V  
 $V_{GS} = -4/15$  V  
 $R_{gon} = 16$   $\Omega$   
 $R_{goff} = 16$   $\Omega$

figure 15.

MOSFET

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

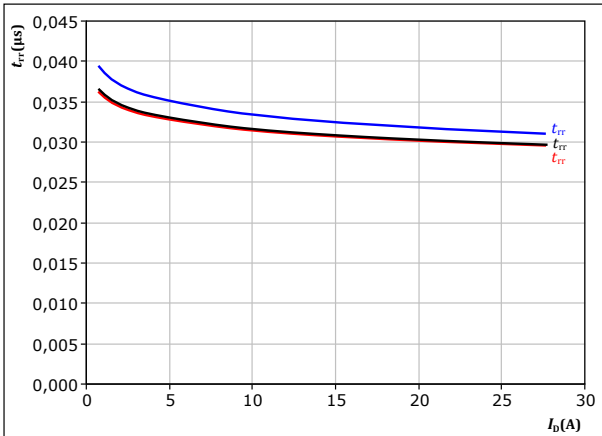


With an inductive load at  
 $T_j = 150$  °C  
 $V_{DS} = 600$  V  
 $V_{GS} = -4/15$  V  
 $I_D = 15$  A

figure 16.

FWD

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

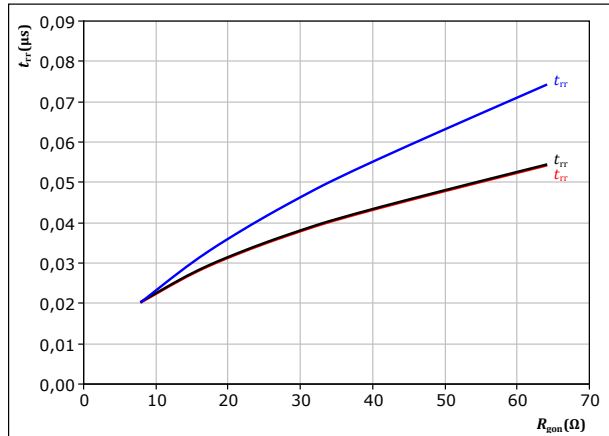


At  $V_{DS} = 600$  V  
 $V_{GS} = -4/15$  V  
 $R_{gon} = 16$   $\Omega$   
 $T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 17.

FWD

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  
 $I_D = 15$  A  
 $T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)



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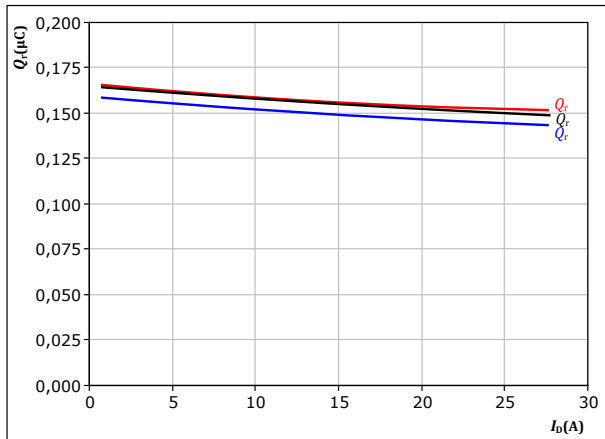
## Inverter Switching Characteristics

figure 18.

FWD

Typical recovered charge as a function of drain current

$$Q_r = f(I_D)$$



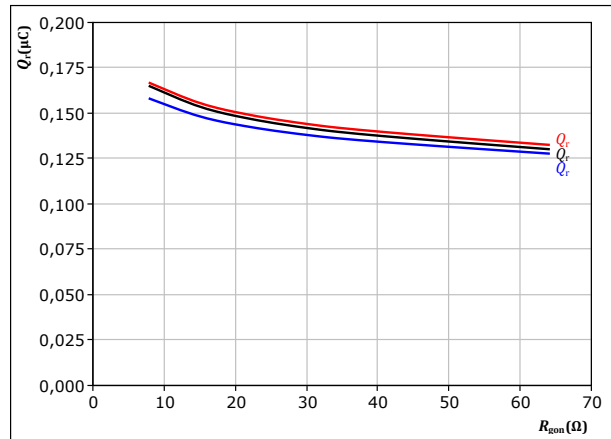
At  $V_{DS} = 600$  V  
 $V_{GS} = -4/15$  V  
 $R_{gon} = 16$  Ω  
 $T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 19.

FWD

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

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



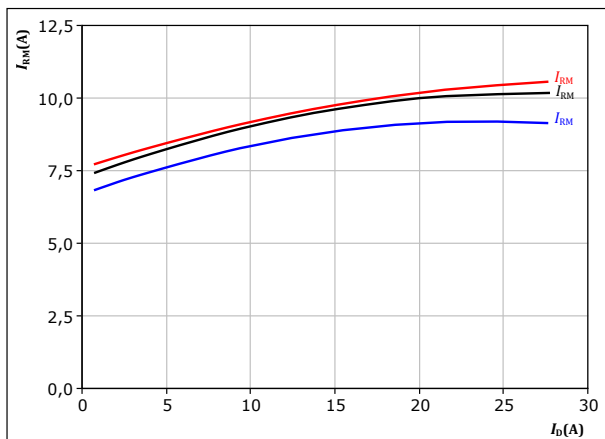
At  $V_{DS} = 600$  V  
 $V_{GS} = -4/15$  V  
 $I_D = 15$  A  
 $T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 20.

FWD

Typical peak reverse recovery current as a function of drain current

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



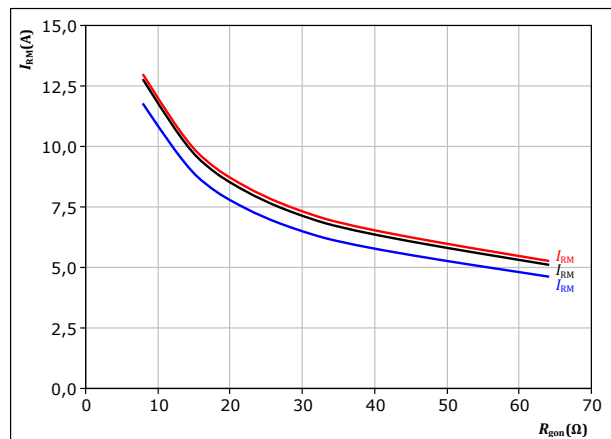
At  $V_{DS} = 600$  V  
 $V_{GS} = -4/15$  V  
 $R_{gon} = 16$  Ω  
 $T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)

figure 21.

FWD

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

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



At  $V_{DS} = 600$  V  
 $V_{GS} = -4/15$  V  
 $I_D = 15$  A  
 $T_j$ : 25 °C (blue), 125 °C (black), 150 °C (red)



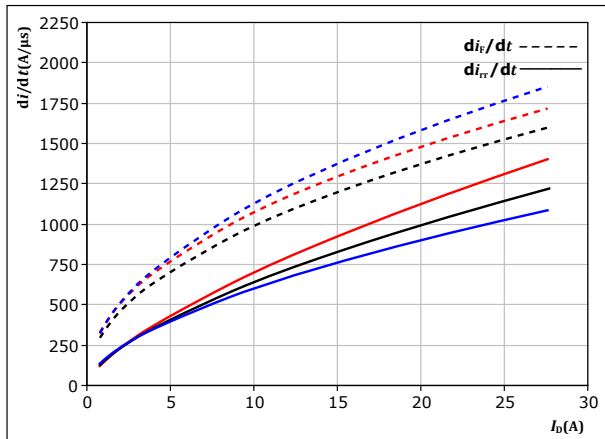
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## Inverter Switching Characteristics

figure 22. FWD

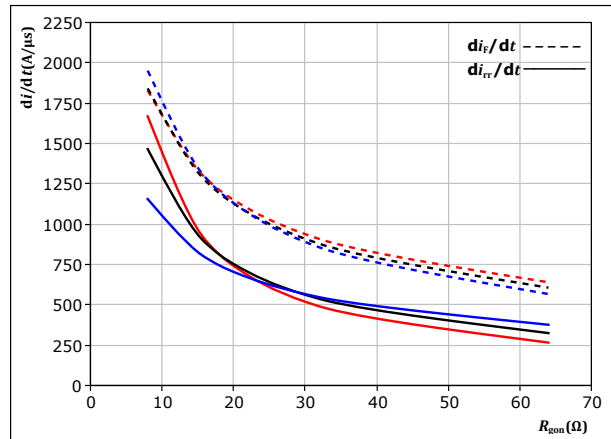
Typical rate of fall of forward and reverse recovery current as a function of drain current  
 $di_f/dt, di_r/dt = f(I_D)$



At  $V_{DS} = 600$  V  
 $V_{GS} = -4/15$  V  
 $R_{gon} = 16$   $\Omega$   
 $T_j$ : 25 °C  
125 °C  
150 °C

figure 23. FWD

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

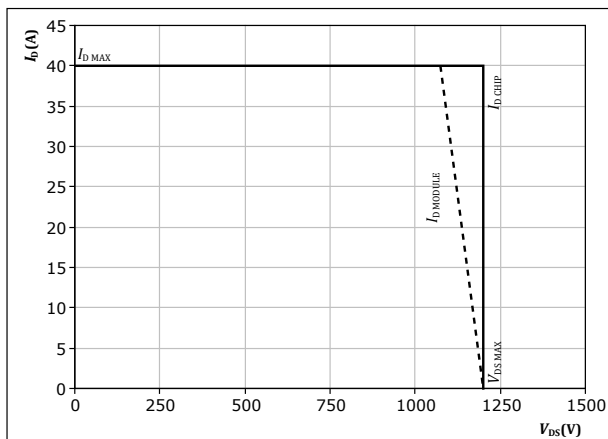


At  $V_{DS} = 600$  V  
 $V_{GS} = -4/15$  V  
 $I_D = 15$  A  
 $T_j$ : 25 °C  
125 °C  
150 °C

figure 24. MOSFET

Reverse bias safe operating area

$I_D = f(V_{DS})$



At  $T_j = 150$  °C  
 $R_{gon} = 16$   $\Omega$   
 $R_{goff} = 16$   $\Omega$



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## Inverter Switching Definitions

figure 25. MOSFET

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

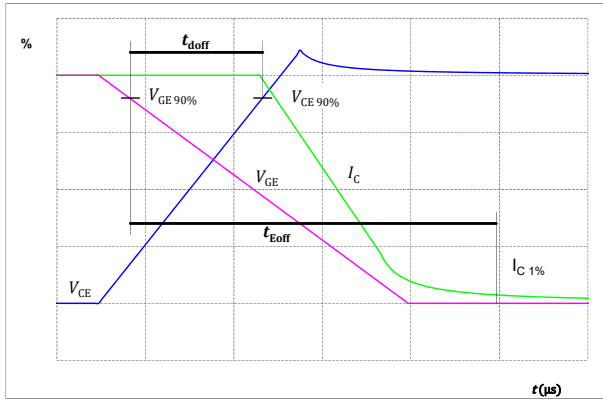


figure 26. MOSFET

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

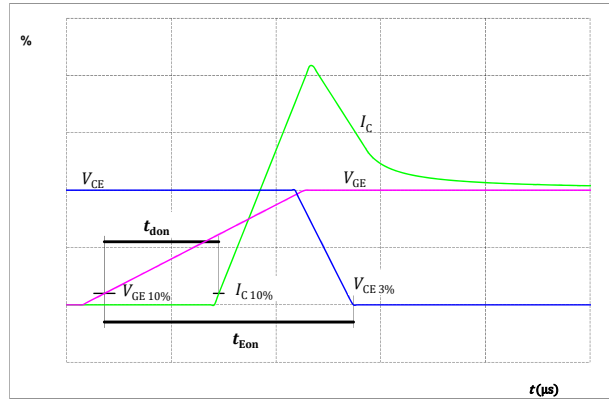


figure 27. MOSFET

Turn-off Switching Waveforms & definition of  $t_f$

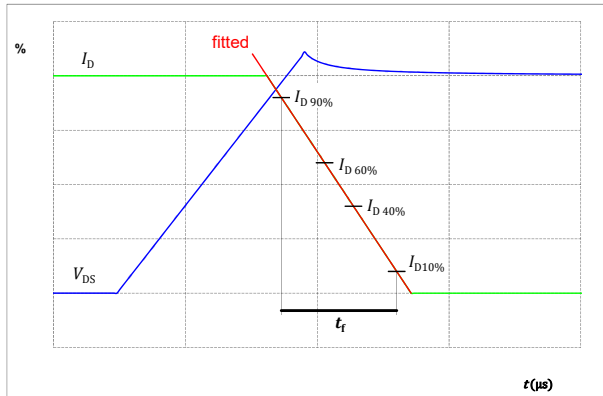
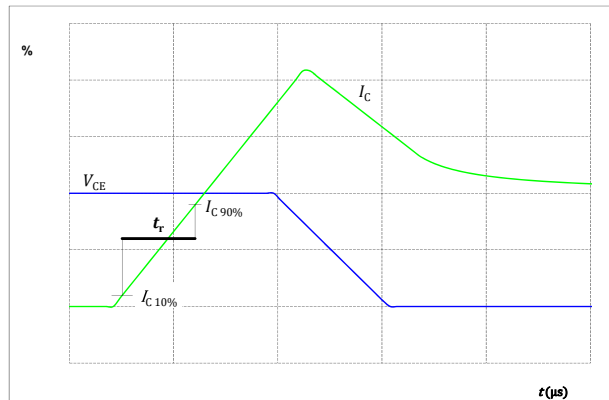


figure 28. MOSFET

Turn-on Switching Waveforms & definition of  $t_r$





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## Inverter Switching Definitions

figure 29.

FWD

Turn-off Switching Waveforms & definition of  $t_{tr}$

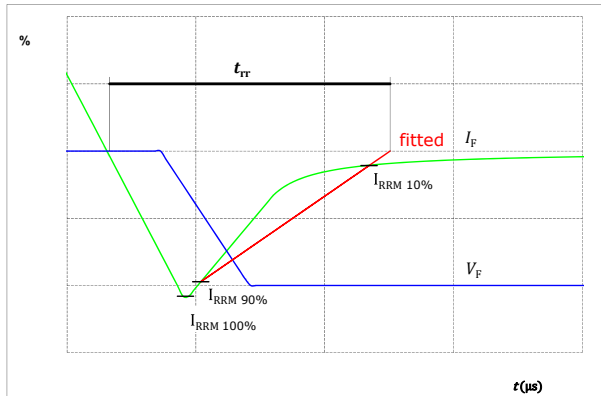


figure 30.

FWD

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

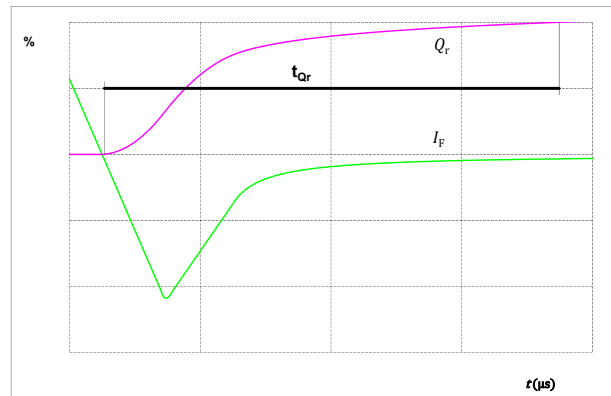
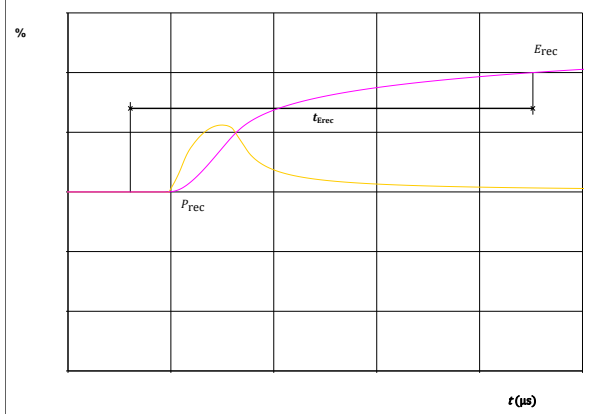


figure 31.

FWD

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









datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	10-PZ126PA075ME-M909F38Y
With thermal paste (5,2 W/mK, PTM6000HV)	10-PZ126PA075ME-M909F38Y-/7/

Marking							
<div><div>NN-NNNNNNNNNNNNNN TTTTTTVVVWYY UL VIN LLLLL SSSS</div><div></div><div></div></div>	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		

## Pin table [mm]

Pin	X	Y	Function
1	33,4	0	DC+
2	25,4	0	DC-
3	25,05	2,8	E5
4	25,05	5,6	G5
5	22,25	5,6	G3
6	22,25	2,8	E3
7	22,25	0	DC-
8	14,25	0	DC+
9	8	0	DC+
10	0	0	DC-
11	0	2,8	E1
12	0	5,6	G1
13	0	22,2	PH11
14	7,15	22,2	PH12
15	7,75	19,2	G2
16	7,75	16,4	E2
17	8,35	10,2	NTC1
18	11,15	11,5	NTC2
19	13,75	16,4	E4
20	13,75	19,2	G4
21	13,15	22,2	PH21
22	19,65	22,2	PH22
23	25,65	22,2	PH31
24	33,4	22,2	PH32
25	31,55	19,2	G6
26	31,55	16,4	E6

## Outline

Tolerance of pinpositions ±0,5mm at the end of pins  
Dimension of coordinate axis is only offset without tolerance



## datasheet

The schematic diagram illustrates the power supply system architecture. It consists of three identical parallel DC-DC converter stages connected between the DC+ and DC- rails.

- Stage 1:** Features a capacitor C1, diode D1, MOSFET T1, and sense resistors E1/G1 and E2/G2. The output terminals are PH11 and PH12.
- Stage 2:** Features a capacitor C2, diode D3, MOSFET T3, and sense resistors E3/G3 and E4/G4. The output terminals are PH21 and PH22.
- Stage 3:** Features a capacitor C3, diode D5, MOSFET T5, and sense resistors E5/G5 and E6/G6. The output terminals are PH31 and PH32.

An NTC thermistor network is shown at the bottom, consisting of two NTC components (NTC1, NTC2) connected to a central node via a variable resistor symbol.

Identification					
ID	Component	Voltage	Current	Function	Comment
T1, T2, T3, T4, T5, T6	MOSFET	1200 V	75 mΩ	Inverter Switch	
D1, D2, D3, D4, D5, D6	FWD	1200 V	10 A	Inverter Diode	
C1, C2, C3	Capacitor	1000 V		Capacitor (DC)	
NTC	Thermistor			Thermistor	



Vincotech

**10-PZ126PA075ME-M909F38Y**  
datasheet

Packaging instruction				
Standard packaging quantity (SPQ) 135	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for <i>flow 0</i> packages see vincotech.com website.

Package data
Package data for <i>flow 0</i> 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-PZ126PA075ME-M909F38Y-D2-14	26 Oct. 2025	Change Inverter Diode according to PCN 2025-001	

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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.