10-PC124PA026ME-L629F91Y
datasheet

fastPACK 0 SiC | **1200 V / 26 mΩ**

Topology features

- Dual halfbridge
- Integrated DC capacitor
- 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: Al_2O_3
- 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

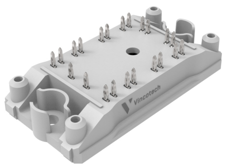
Target applications

- Charging Stations
- Energy Storage Systems
- Power Supply
- Solar Inverters
- UPS
- Welding & Cutting

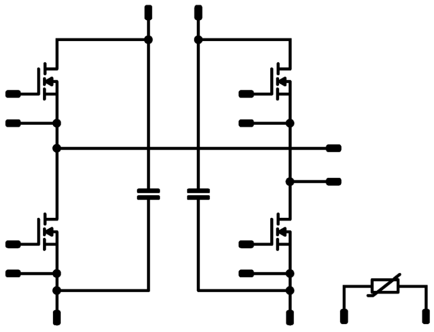
Types

- 10-PC124PA026ME-L629F91Y

flow 0 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}			1200	V
Drain current (DC current)	I_D	$T_j = T_{jmax}$	T_s = 80 °C	40	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}		152	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	75	W
Gate-source voltage	V_{GSS}	static		-4 / 15	V
		dynamic		-8 / 19	V
Maximum Junction Temperature	T_{jmax}			175	°C
Capacitor (DC)					
Maximum DC voltage	V_{MAX}			1000	V
Operation Temperature	T_{op}			... 125	°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				9,19	mm
Comparative Tracking Index	CTI			≥ 200	

*100 % tested in production

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
Inverter Switch										
Static										
Drain-source on-state resistance(1)	$r_{DS(on)}$		15		38	25 175	18,2	26 49	33,8	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}			0,0107	25	1,8	2,7	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	50	µA
Internal gate resistance	r_g							4,1		Ω
Gate charge	Q_g		-4/15	800	38	25		136		nC
Short-circuit input capacitance	C_{iss}	f = 100 kHz	0	1000	0	25		3470		pF
Short-circuit output capacitance	C_{oss}							110		
Reverse transfer capacitance	C_{rss}							9		
Diode forward voltage	V_{SD}		0		19,5	25		4,8		V
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,27		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} = 4 Ω R_{goff} = 4 Ω	-4/15	600	38	25 125 150		20,41 19,12 18,69		ns
Rise time	t_r					25 125 150		7,47 7,06 7,13		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		54,85 60,36 61,51		ns
Fall time	t_f					25 125 150		15,82 15,02 14,13		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,34 μC Q_{rFWD}=0,6 μC Q_{rFWD}=0,778 μC				25 125 150		0,414 0,445 0,468		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,178 0,193 0,199		mWs
Peak recovery current	I_{RRM}	di/dt=5949 A/μs di/dt=7222 A/μs di/dt=7517 A/μs				25 125 150		43,51 56,18 63,33		A
Reverse recovery time	t_{rr}					25 125 150		13,45 19,14 21,44		ns
Recovered charge	Q_r					25 125 150		0,34 0,6 0,778		μC
Reverse recovered energy	E_{rec}					25 125 150		0,112 0,246 0,333		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		8165,91 6915,65 6797,43		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	
Capacitor (DC)										
Static										
Capacitance	C	DC bias voltage = 0 V				25		2,2		nF
Tolerance							-5		5	%
Dissipation factor		f = 1 kHz				25		1,5		%
Thermistor										
Static										
Rated resistance	R					25		22		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 1484 Ω				100	-5		5	%
Power dissipation	P					25		130		mW
Power dissipation constant	d					25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. ±1 %						3962		K
B-value	$B_{(25/100)}$	Tol. ±1 %						4000		K
Vincotech Thermistor Reference									I	

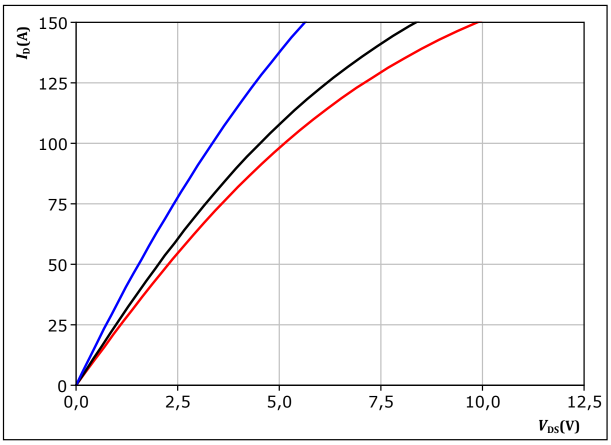
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

Inverter Switch Characteristics

figure 1. **MOSFET**

Typical output characteristics including $R_{DD'} + R_{SS'}$

I_D = f(V_{DS})



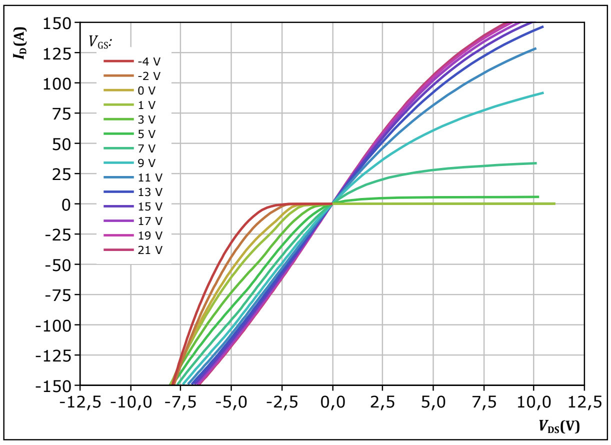
t_p = 250 µs
V_{GS} = 15 V

T_j: 25 °C, 125 °C, 150 °C

figure 2. **MOSFET**

Typical output characteristics including $R_{DD'} + R_{SS'}$

I_D = f(V_{DS})

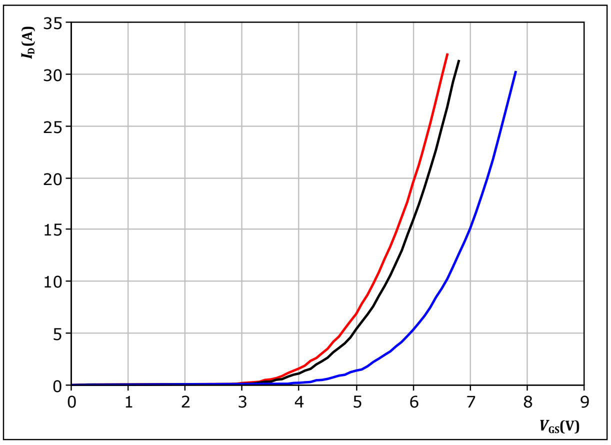


t_p = 250 µs
T_j = 150 °C
V_{GS} from -4 V to 21 V in steps of 2 V

figure 3. **MOSFET**

Typical transfer characteristics

I_D = f(V_{GS})



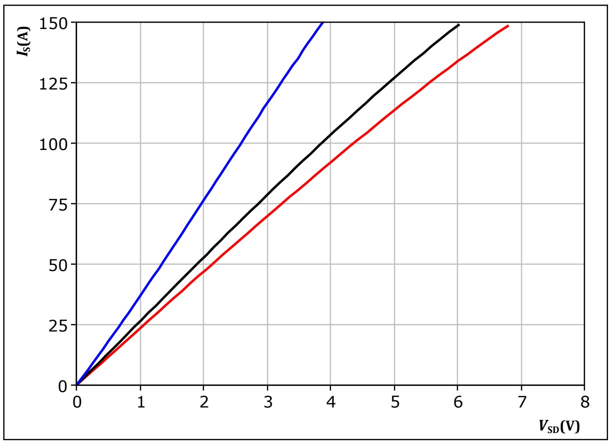
t_p = 250 µs
V_{DS} = 20 V

T_j: 25 °C, 125 °C, 150 °C

MOSFET

Typical reverse drain current characteristics including $R_{DD'} + R_{SS'}$

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



t_p = 250 µs
V_{GS} = 15 V

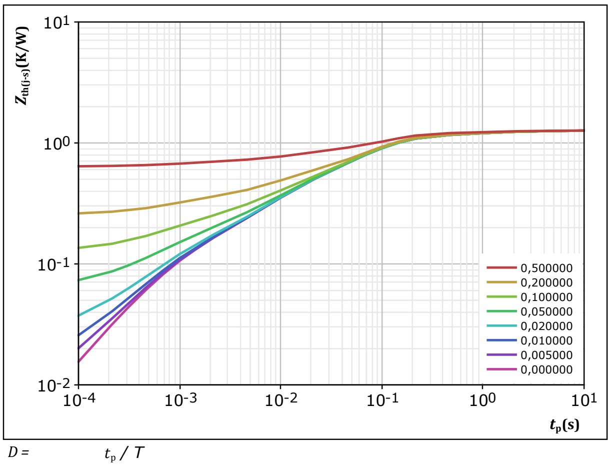
T_j: 25 °C, 125 °C, 150 °C

Inverter Switch Characteristics

figure 5. **MOSFET**

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$

$R_{th(j-s)} =$ 1,267 K/W

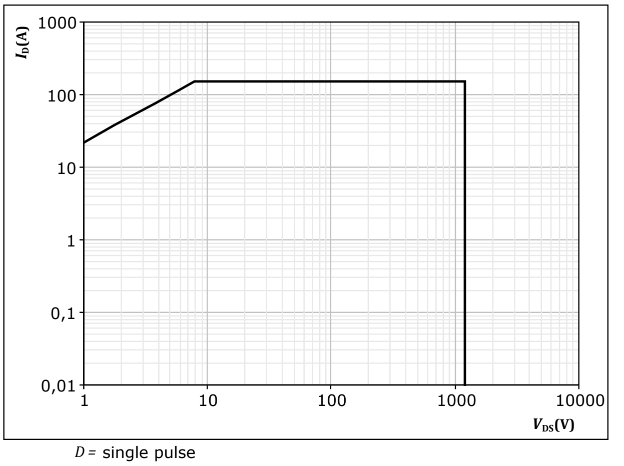
MOSFET thermal model values

R (K/W)	τ (s)
4,09E-02	7,07E+00
1,32E-01	7,50E-01
7,64E-01	7,88E-02
2,42E-01	8,81E-03
9,63E-02	7,62E-04

figure 6. **MOSFET**

Safe operating area

$I_D = f(V_{DS})$



$D =$ single pulse

$T_s =$ 80 °C

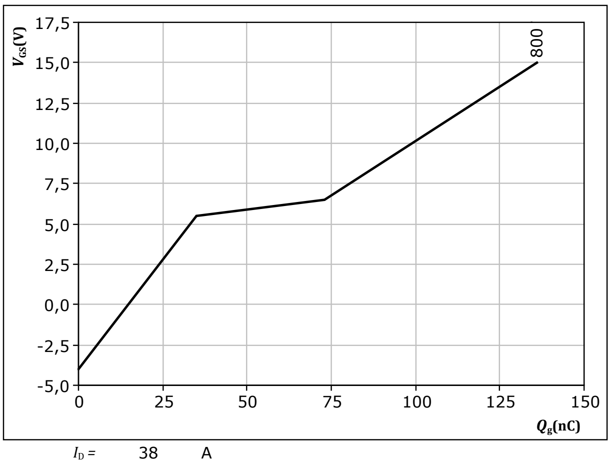
$V_{GS} =$ 15 V

$T_j = T_{jmax}$

figure 7. **MOSFET**

Gate voltage vs gate charge

$V_{GS} = f(Q_g)$



$I_D =$ 38 A

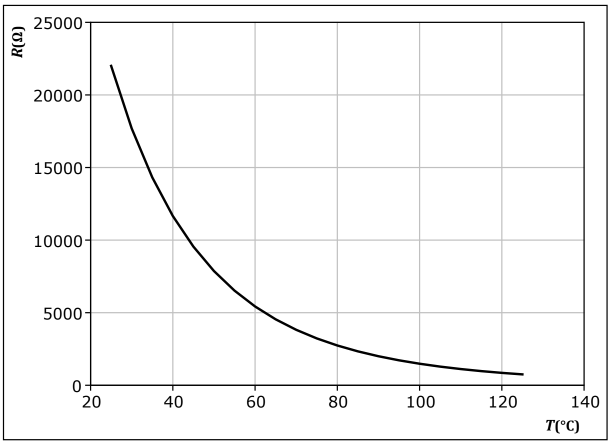
$T_j =$ 25 °C

Thermistor Characteristics

figure 8.	Thermistor

Typical NTC characteristic as function of temperature

R_T = f(T)

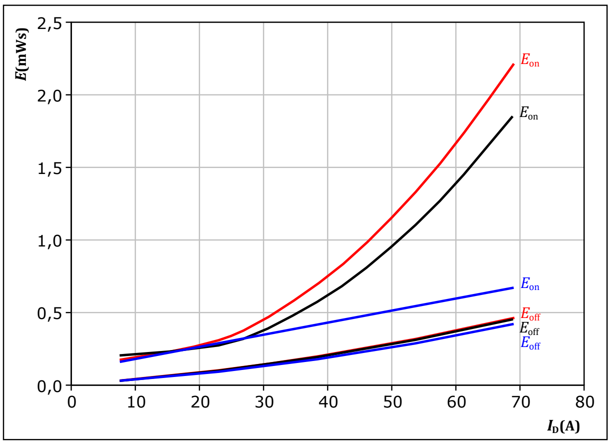


Inverter Switching Characteristics

figure 9. **MOSFET**

Typical switching energy losses as a function of drain current

$E = f(I_D)$



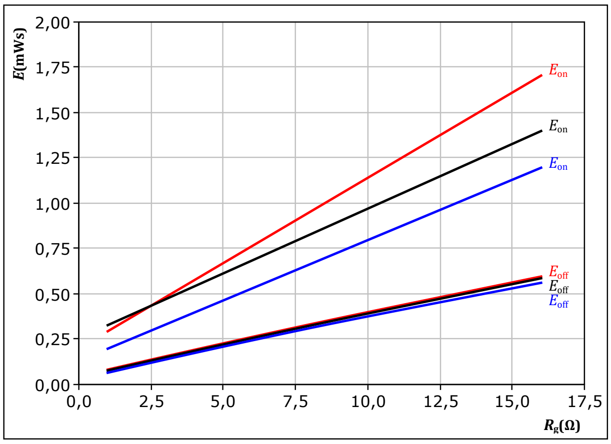
With an inductive load at

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

figure 10. **MOSFET**

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

$E = f(R_g)$



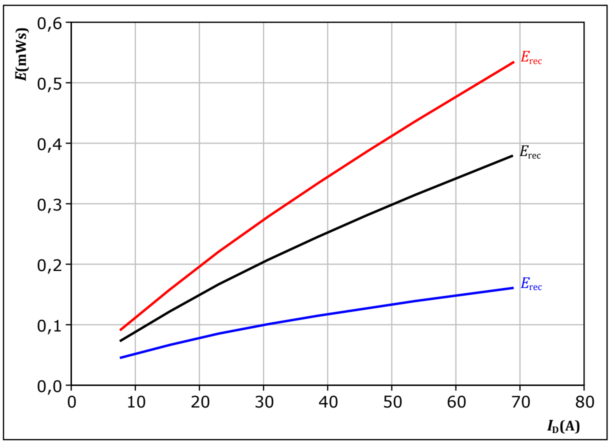
With an inductive load at

V_{DS} =	600	V	T_j: 25 °C / 125 °C / 150 °C
V_{GS} =	-4/15	V	
I_D =	38	A	

figure 11. **MOSFET**

Typical reverse recovered energy loss as a function of drain current

$E_{rec} = f(I_D)$



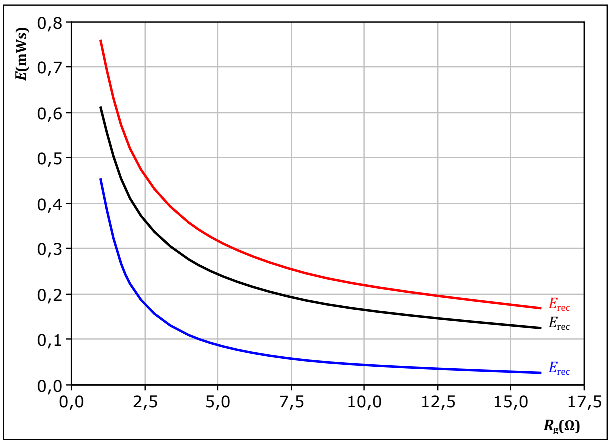
With an inductive load at

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

figure 12. **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

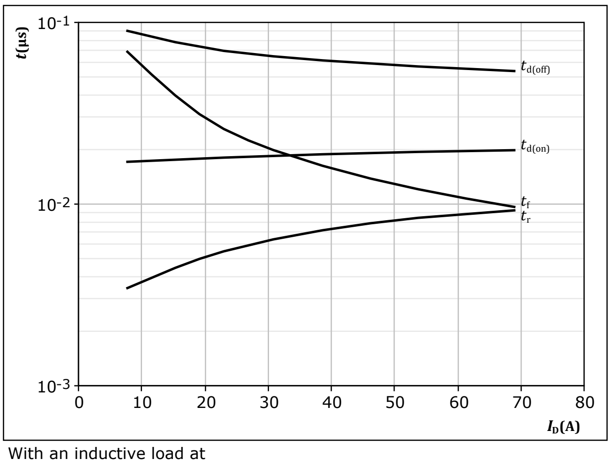
V_{DS} =	600	V	T_j: 25 °C / 125 °C / 150 °C
V_{GS} =	-4/15	V	
I_D =	38	A	

Inverter Switching Characteristics

figure 13. **MOSFET**

Typical switching times as a function of drain current

t = f(I_D)



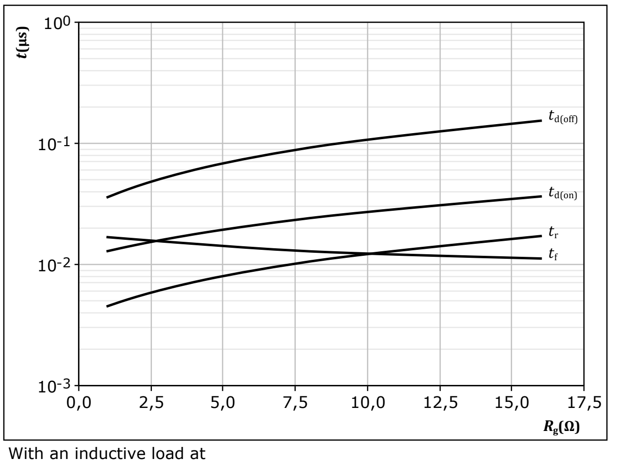
With an inductive load at

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

figure 14. **MOSFET**

Typical switching times as a function of MOSFET turn on gate resistor

t = f(R_g)



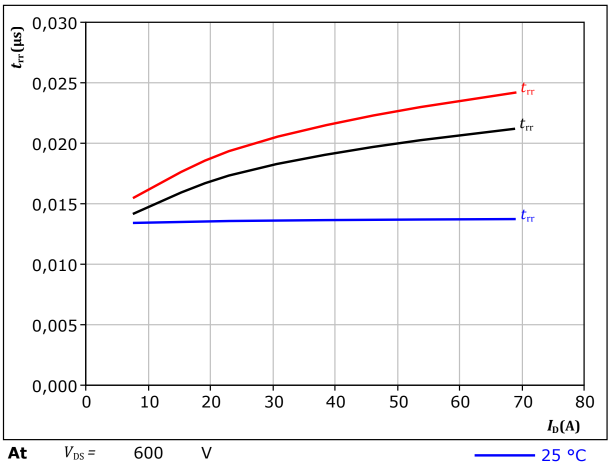
With an inductive load at

T_j =	150	°C
V_{DS} =	600	V
V_{GS} =	-4/15	V
I_D =	38	A

figure 15. **MOSFET**

Typical reverse recovery time as a function of drain current

t_{rr} = f(I_D)

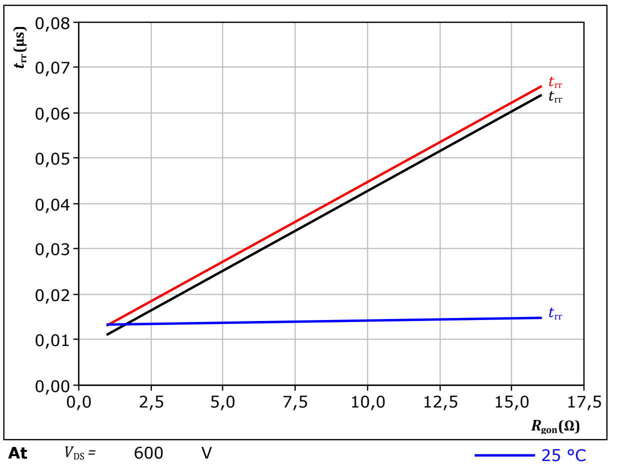


At				
V_{DS} =	600	V	T_j:	25 °C
V_{GS} =	-4/15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 16. **MOSFET**

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

t_{rr} = f(R_{gon})



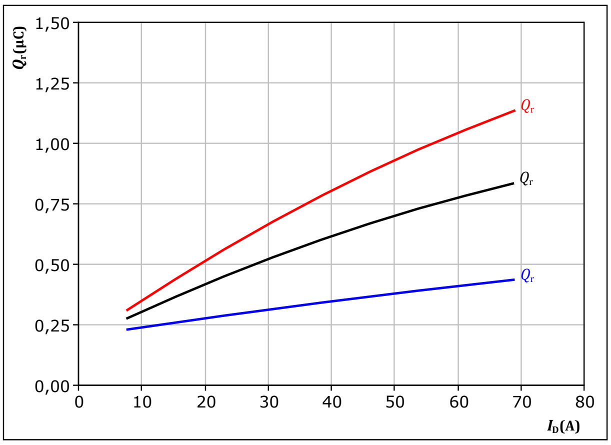
At				
V_{DS} =	600	V	T_j:	25 °C
V_{GS} =	-4/15	V		125 °C
I_D =	38	A		150 °C

Inverter Switching Characteristics

figure 17. **MOSFET**

Typical recovered charge as a function of drain current

Q_r = f(I_D)

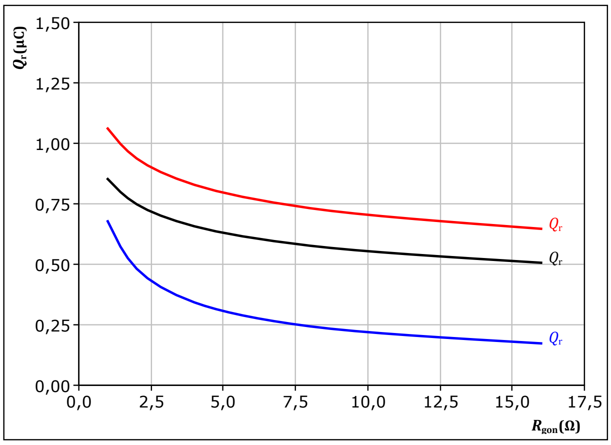


At				
	V_{DS} =	600	V	
	V_{GS} =	-4/15	V	T_j: 25 °C / 125 °C / 150 °C
	R_{gon} =	4	Ω	

figure 18. **MOSFET**

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

Q_r = f(R_{gon})

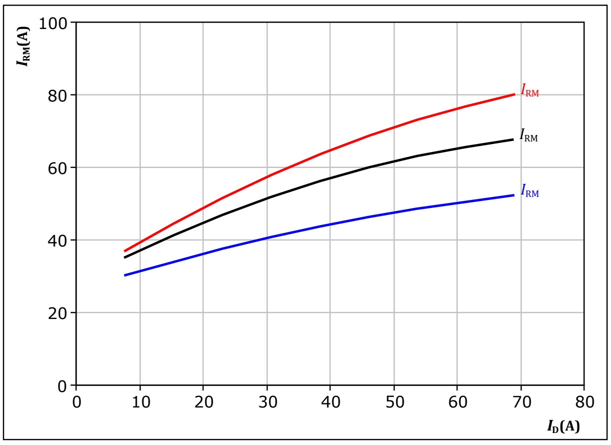


At				
	V_{DS} =	600	V	
	V_{GS} =	-4/15	V	T_j: 25 °C / 125 °C / 150 °C
	I_D =	38	A	

figure 19. **MOSFET**

Typical peak reverse recovery current as a function of drain current

I_{RM} = f(I_D)

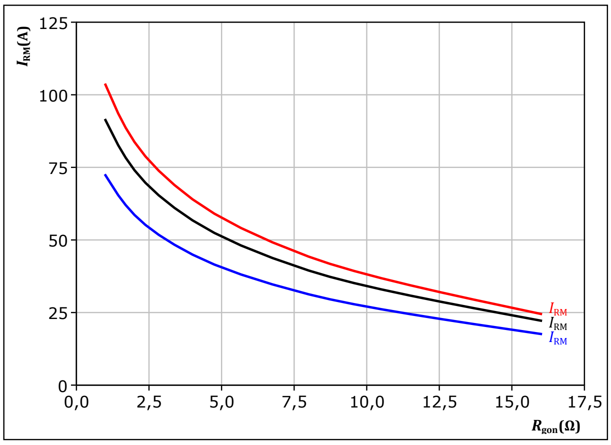


At				
	V_{DS} =	600	V	
	V_{GS} =	-4/15	V	T_j: 25 °C / 125 °C / 150 °C
	R_{gon} =	4	Ω	

figure 20. **MOSFET**

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

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



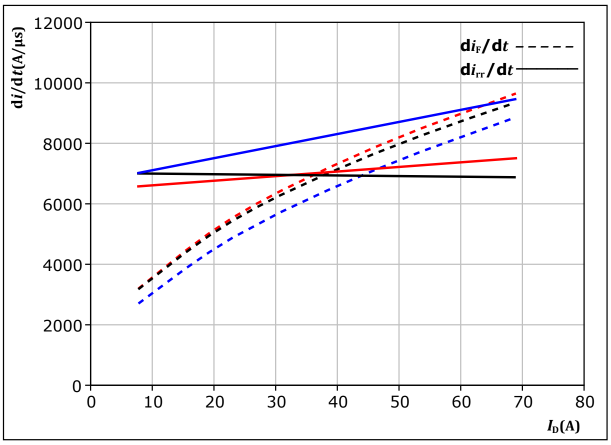
At				
	V_{DS} =	600	V	
	V_{GS} =	-4/15	V	T_j: 25 °C / 125 °C / 150 °C
	I_D =	38	A	

Inverter Switching Characteristics

figure 21. **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)



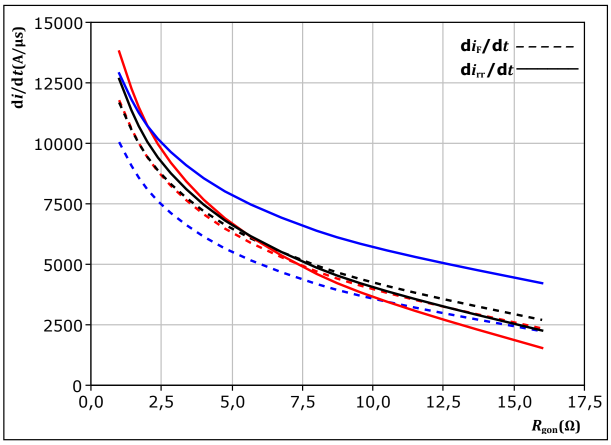
At			
	V_{DS} =	600	V
	V_{GS} =	-4/15	V
	R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 22. **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})



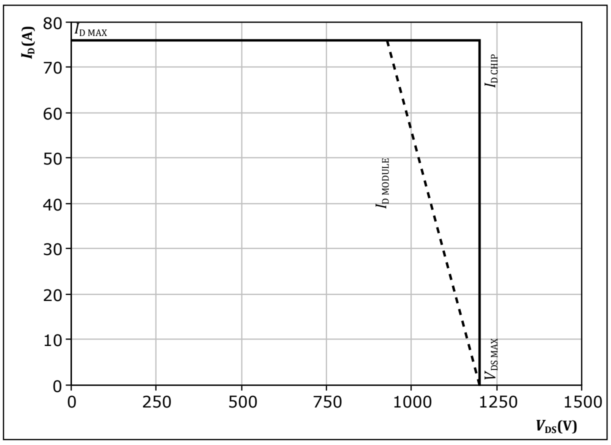
At			
	V_{DS} =	600	V
	V_{GS} =	-4/15	V
	I_D =	38	A

T_j: 25 °C, 125 °C, 150 °C

figure 23. **MOSFET**

Reverse bias safe operating area

I_D = f(V_{DS})



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

Inverter Switching Definitions

figure 24. **MOSFET**

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

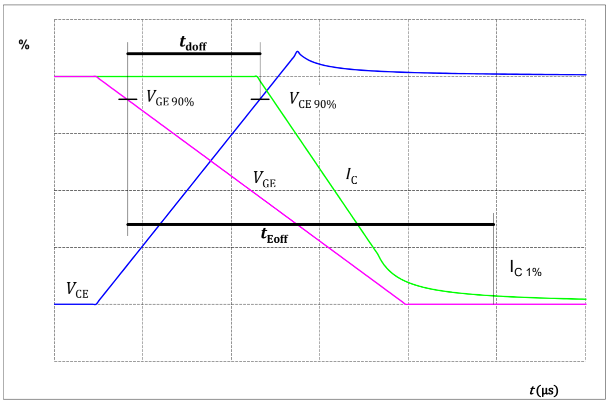


figure 25. **MOSFET**

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

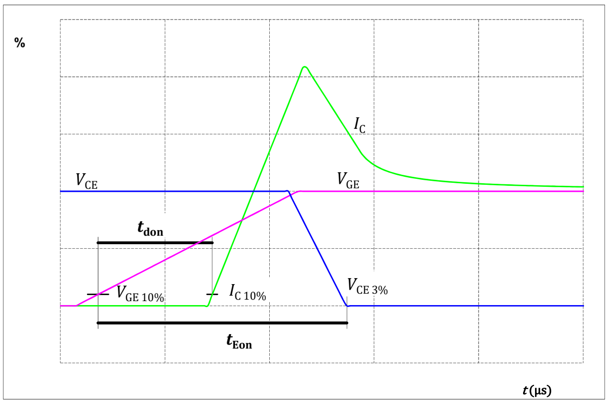


figure 26. **MOSFET**

Turn-off Switching Waveforms & definition of t_f

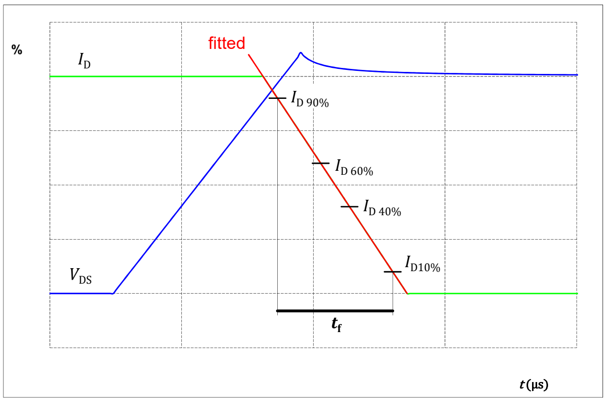
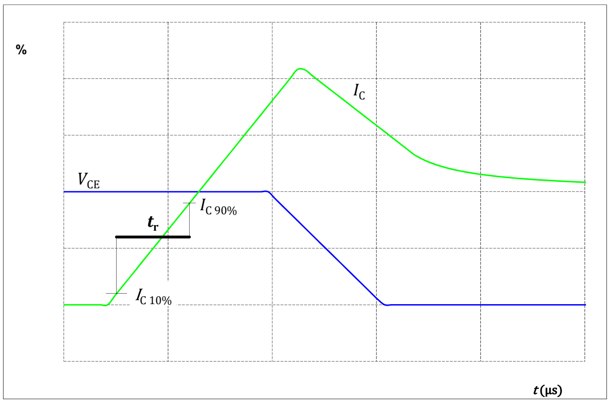


figure 27. **MOSFET**

Turn-on Switching Waveforms & definition of t_r



Inverter Switching Definitions

figure 28. **FWD**

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

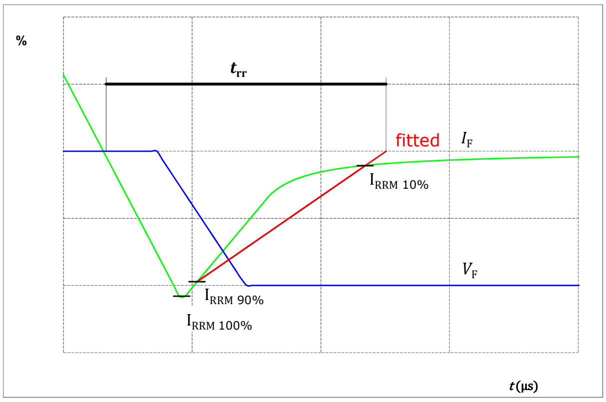


figure 29. **FWD**

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

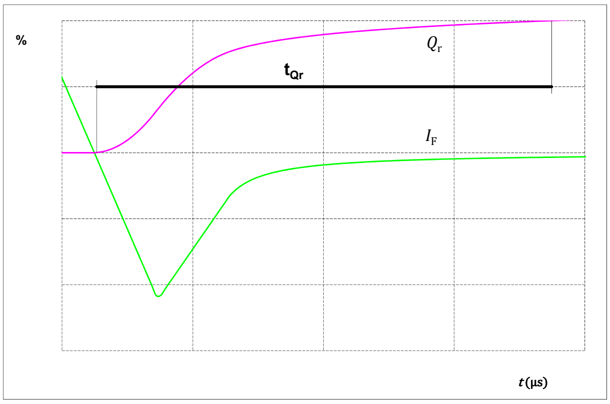
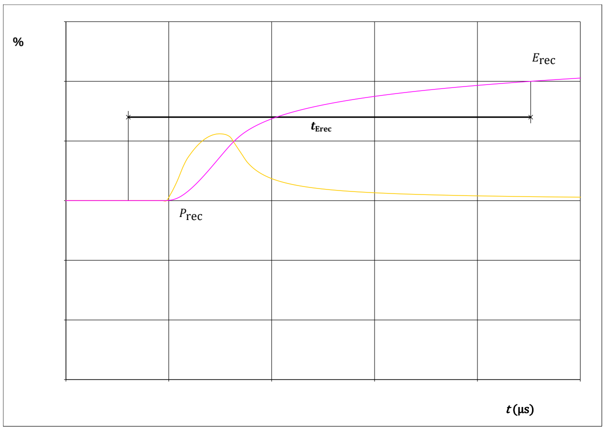


figure 30. **FWD**

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



Ordering Code

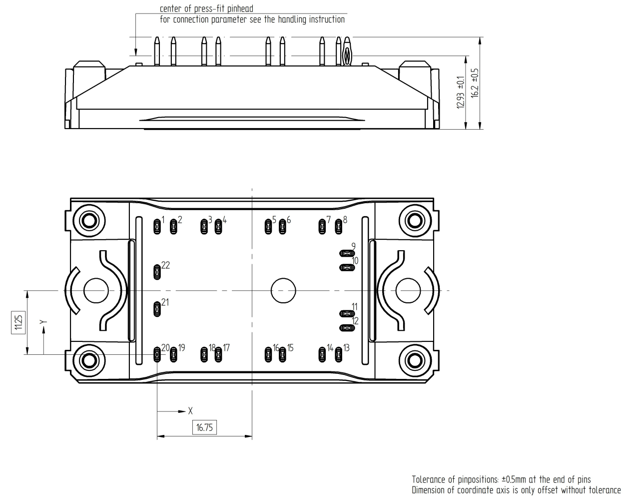
Version	Ordering Code
Without thermal paste	10-PC124PA026ME-L629F91Y
With thermal paste (5,2 W/mK, PTM6000HV)	10-PC124PA026ME-L629F91Y-/7/

Marking

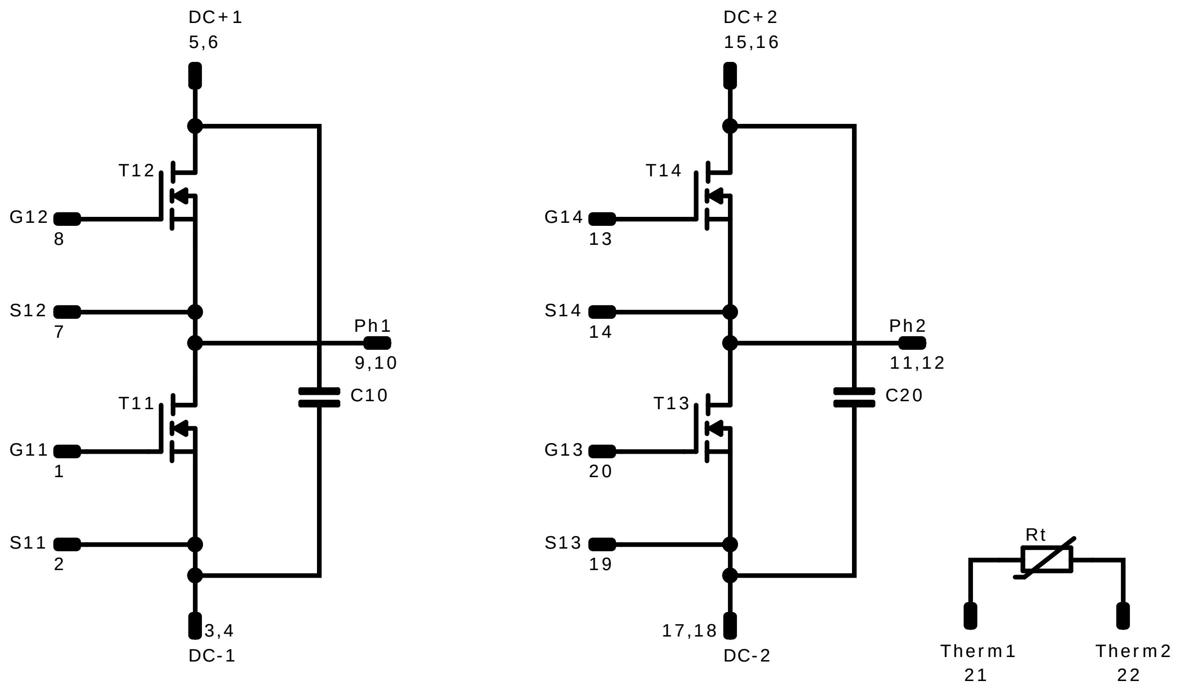
	**Text**	**Name**		**Date code**	**UL & VIN**	**Lot**	**Serial**
		NN-NNNNNNNNNNNNNN-TTTTTTTVV		WWYY	UL VIN	LLLLL	SSSS
	Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
		TTTTTTTVV	LLLLL	SSSS	WWYY		

Outline

Pin	X	Y	Function
Pin table [mm]			
1	0	22,5	G11
2	2,9	22,5	S11
3	8,3	22,5	DC-1
4	10,8	22,5	DC-1
5	19,6	22,5	DC+1
6	22,1	22,5	DC+1
7	29,1	22,5	S12
8	32	22,5	G12
9	33,5	17,8	Ph1
10	33,5	15,3	Ph1
11	33,5	7,2	Ph2
12	33,5	4,7	Ph2
13	32	0	G14
14	29,1	0	S14
15	22,1	0	DC+2
16	19,6	0	DC+2
17	10,8	0	DC-2
18	8,3	0	DC-2
19	2,9	0	S13
20	0	0	G13
21	0	8	Therm1
22	0	14,5	Therm2



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14	MOSFET	1200 V	26 mΩ	Inverter Switch	
C10, C20	Capacitor	1000 V		Capacitor (DC)	
Rt	Thermistor			Thermistor	

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

Handling instruction
Handling instructions for *flow* 0 packages see vincotech.com website.

Package data
Package data for *flow* 0 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-PC124PA026ME-L629F91Y-D1-14	1 Jun. 2025	Initial Release	