Vincotech

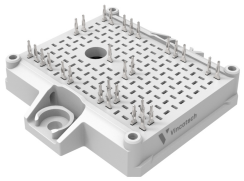
10-EY12NMA011ME30-LS28F18T
datasheet

***flow*MNPC E2** **1200 V / 11 mΩ**

Features

- Three-level high efficient topology
- High frequency SIC MOSFET
- Compact and low inductive design
- Integrated NTC

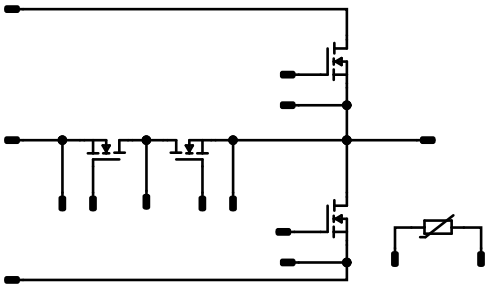
flow E2 12 mm housing



Target applications

- Power Supply

Schematic



Types

- 10-EY12NMA011ME30-LS28F18T

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Buck Switch				
Drain-source voltage	V_{DSS}		1200	V
Drain current (DC current)	I_D	T_j = T_{jmax} T_s = 80 °C	110	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	360	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	194	W
Gate-source voltage	V_{GSS}		-4 / 15	V
		dynamic	-8 / 19	
Maximum Junction Temperature	T_{jmax}		175	°C
Boost Switch				
Drain-source voltage	V_{DSS}		1200	V
Drain current (DC current)	I_D	T_j = T_{jmax} T_s = 80 °C	110	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	360	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	194	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
Isolation voltage	V_{isol}	AC Voltage t_p = 1 min	2500	V
Creepage distance			>12,7	mm
Clearance			9,08	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	
Buck Switch										
Static										
Drain-source on-state resistance	$r_{DS(on)}$		15		120	25 125 150	7,47	10 14 15	13,87(1)	mΩ
Gate-source threshold voltage	$V_{GS(th)}$		0		0,0345	25	1,8	2,5	3,6	V
Gate to Source Leakage Current	I_{GSS}		15	0		25		30	750	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1200		25		3	57	µA
Internal gate resistance	r_g							0,567		Ω
Gate charge	Q_g		-4/15	800	120	25		354		nC
Short-circuit input capacitance	C_{iss}	f = 100 kHz	0	1000	0	25		10071		pF
Short-circuit output capacitance	C_{oss}							387		
Reverse transfer capacitance	C_{rss}							24		
Diode forward voltage	V_{SD}		0		60	25		4,6		V
Thermal										
Thermal resistance junction to sink (2)	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,49		K/W

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 Ω R_{goff} = 4 Ω	-4/15	350	95	25 125 150		39,73 36,37 35,82		ns
Rise time	t_r					25 125 150		19,2 16,47 15,97		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		78,17 85,41 87,88		ns
Fall time	t_f					25 125 150		26,82 26,52 27,83		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,834 µC Q_{rFWD}=1,74 µC Q_{rFWD}=2,05 µC				25 125 150		0,572 0,522 0,512		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,359 0,372 0,38		mWs
Peak recovery current	I_{RRM}	di/dt=6334 A/µs di/dt=6942 A/µs di/dt=7078 A/µs		600	80	25 125 150		60,2 89,93 102,11		A
Reverse recovery time	t_{rr}					25 125 150		19,19 27,81 29,38		ns
Recovered charge	Q_r					25 125 150		0,665 1,58 1,93		µC
Reverse recovered energy	E_{rec}					25 125 150		0,12 0,436 0,559		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		8825,36 8339,9 10224,85		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	
Boost Switch										
Static										
Drain-source on-state resistance	$r_{DS(on)}$		15		120	25 125 150	7,47	10 14 15	13,87[1]	mΩ
Gate-source threshold voltage	$V_{GS(th)}$		0		0,0345	25	1,8	2,5	3,6	V
Gate to Source Leakage Current	I_{GSS}		15	0		25		30	750	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1200		25		3	57	µA
Internal gate resistance	r_g							0,567		Ω
Gate charge	Q_g		-4/15	800	120	25		354		nC
Short-circuit input capacitance	C_{iss}	f = 100 kHz	0	1000	0	25		10071		pF
Short-circuit output capacitance	C_{oss}							387		
Reverse transfer capacitance	C_{rss}							24		
Diode forward voltage	V_{SD}		0		60	25		4,6		V
Thermal										
Thermal resistance junction to sink [2]	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,49		K/W

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 Ω R_{goff} = 4 Ω	-4/15	600	80	25 125 150		39,18 35,99 35,34		ns
Rise time	t_r					25 125 150		15,5 13,53 13,12		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		91,9 101,19 103,17		ns
Fall time	t_f					25 125 150		16,26 18,5 16,87		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,665 µC Q_{rFWD}=1,58 µC Q_{rFWD}=1,93 µC				25 125 150		1,26 1,32 1,39		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,676 0,65 0,672		mWs
Peak recovery current	I_{RRM}	di/dt=6062 A/µs di/dt=6980 A/µs di/dt=6940 A/µs		350	95	25 125 150		60,77 93,48 103,96		A
Reverse recovery time	t_{rr}					25 125 150		23,51 30,2 32,02		ns
Recovered charge	Q_r					25 125 150		0,834 1,74 2,05		µC
Reverse recovered energy	E_{rec}					25 125 150		0,172 0,428 0,511		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		7756,34 8647,86 9554,37		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 R_{100}	$\Delta_{R/R}$	R_{100} = 493 Ω				100	-5		5	%
Power dissipation	P							245		mW
Power dissipation constant	d					25		1,4		mW/K
B-value	$B_{(25/50)}$	Tol. ±2 %						3375		K
B-value	$B_{(25/100)}$	Tol. ±2 %						3437		K
Vincotech Thermistor Reference									K	

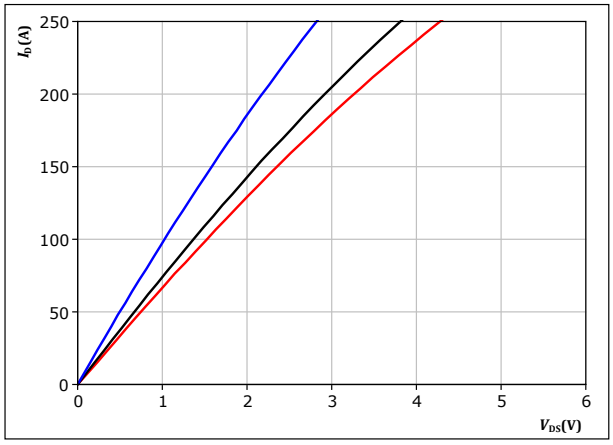
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

Buck Switch Characteristics

figure 1. **MOSFET**

Typical output characteristics

$I_D = f(V_{DS})$

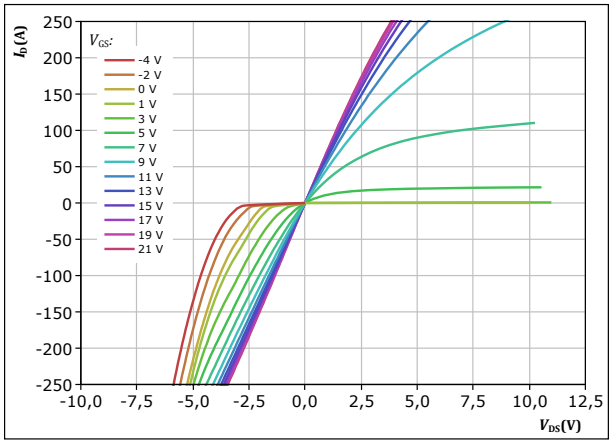


t_p =	250	µs		
V_{GS} =	15	V	T_j:	25 °C
				125 °C
				150 °C

figure 2. **MOSFET**

Typical output characteristics

$I_D = f(V_{DS})$



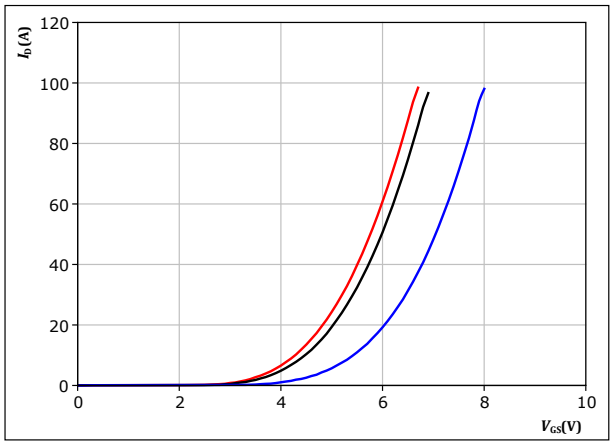
t_p =	250	µs
T_j =	150	°C

V_{GS} from -4 V to 21 V in steps of 2 V

figure 3. **MOSFET**

Typical transfer characteristics

$I_D = f(V_{GS})$

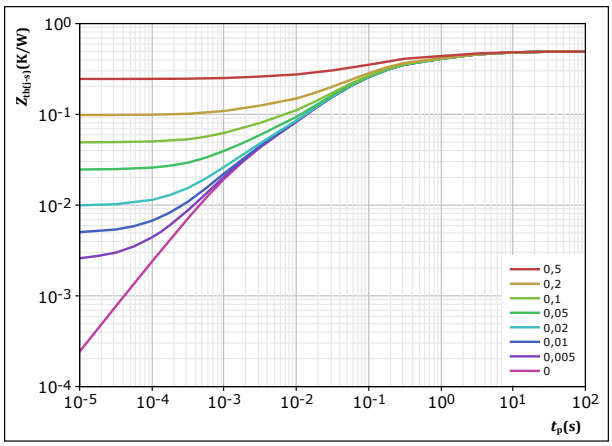


t_p =	250	µs		
V_{DS} =	10	V	T_j:	25 °C
				125 °C
				150 °C

figure 4. **MOSFET**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,491	K/W

MOSFET thermal model values

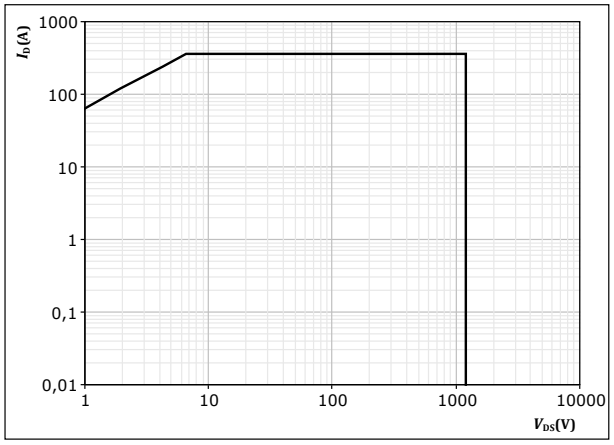
R (K/W)	τ (s)
4,84E-02	6,00E+00
1,15E-01	9,56E-01
2,27E-01	9,87E-02
7,54E-02	1,62E-02
2,51E-02	1,45E-03

Buck Switch Characteristics

figure 5. **MOSFET**

Safe operating area

$I_D = f(V_{DS})$



D = single pulse

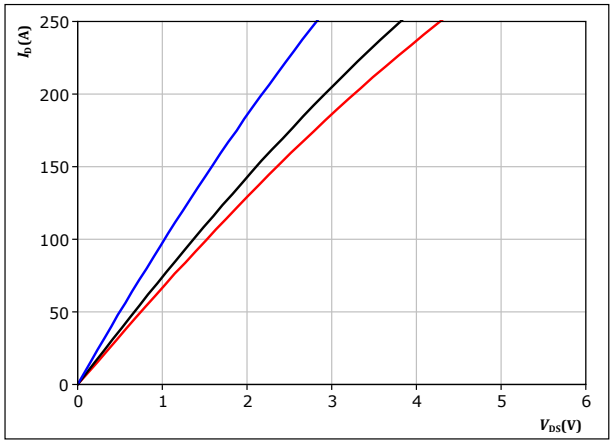
T_s =	80	°C
V_{GS} =	15	V
T_j =	T_{jmax}	

Boost Switch Characteristics

figure 6. **MOSFET**

Typical output characteristics

$I_D = f(V_{DS})$

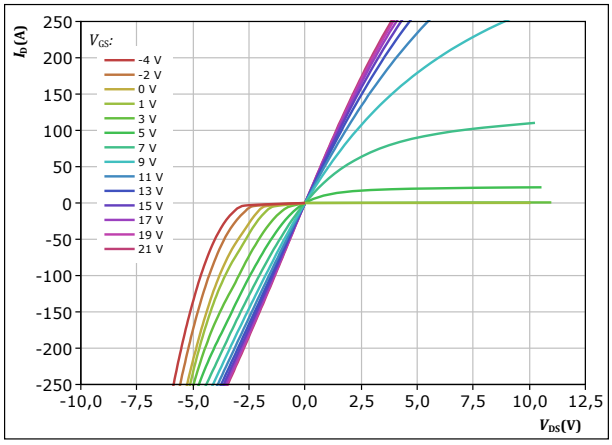


t_p =	250	µs		
V_{GS} =	15	V	T_j:	25 °C
				125 °C
				150 °C

figure 7. **MOSFET**

Typical output characteristics

$I_D = f(V_{DS})$



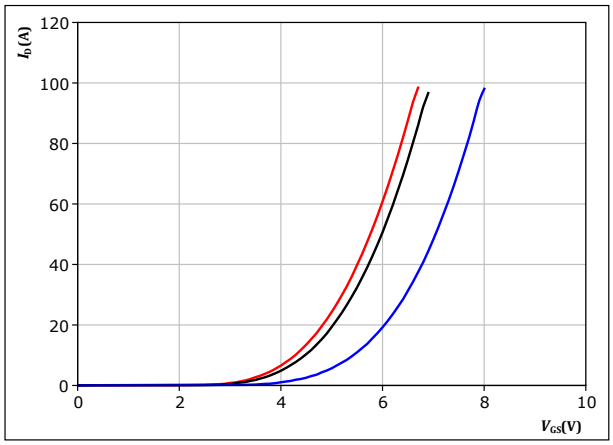
t_p =	250	µs
T_j =	150	°C

V_{GS} from -4 V to 21 V in steps of 2 V

figure 8. **MOSFET**

Typical transfer characteristics

$I_D = f(V_{GS})$

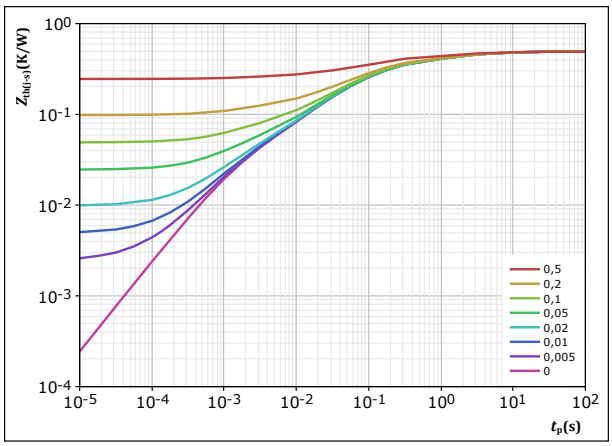


t_p =	250	µs		
V_{DS} =	10	V	T_j:	25 °C
				125 °C
				150 °C

figure 9. **MOSFET**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	0,491	K/W

MOSFET thermal model values

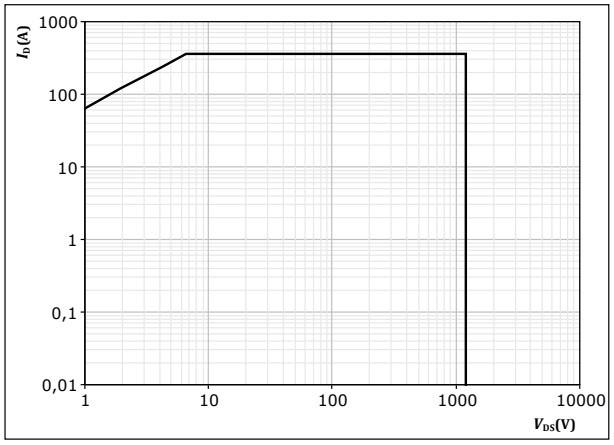
R (K/W)	τ (s)
4,84E-02	6,00E+00
1,15E-01	9,56E-01
2,27E-01	9,87E-02
7,54E-02	1,62E-02
2,51E-02	1,45E-03

Boost Switch Characteristics

figure 10. **MOSFET**

Safe operating area

$I_D = f(V_{DS})$



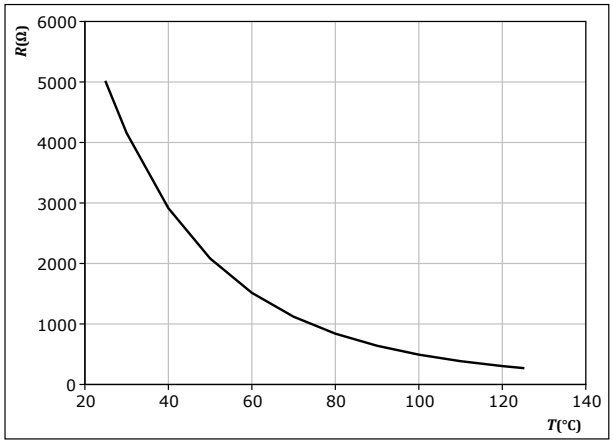
D = single pulse
T_s = 80 °C
V_{GS} = 15 V
T_j = T_{jmax}

Thermistor Characteristics

figure 11. **Thermistor**

Typical NTC characteristic as function of temperature

$R_T = f(T)$

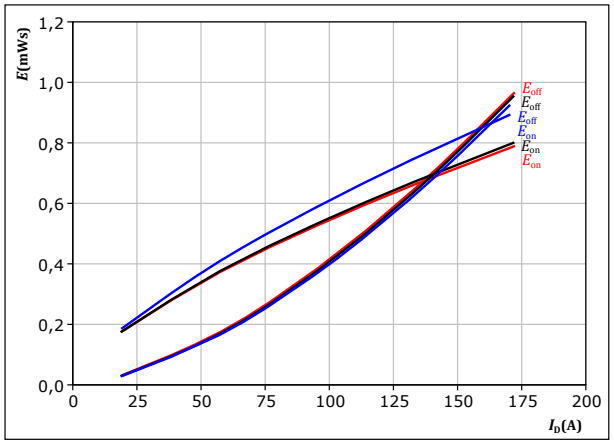


Buck Switching Characteristics

figure 12. **MOSFET**

Typical switching energy losses as a function of drain current

$E = f(I_D)$



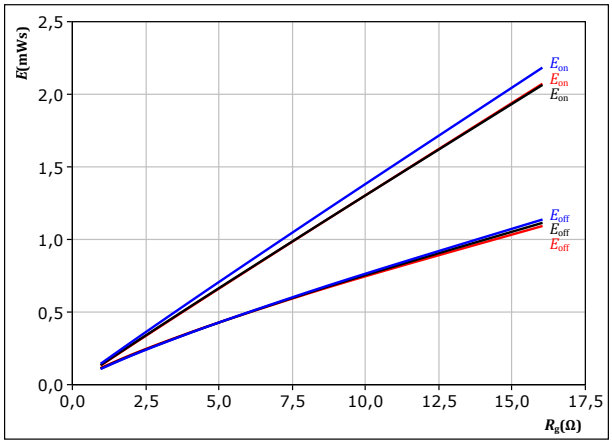
With an inductive load at

V_{DS} =	350	V	T_j:	25 °C
V_{GS} =	-4/15	V		125 °C
R_{gon} =	4	Ω		150 °C
R_{goff} =	4	Ω		

figure 13. **MOSFET**

Typical switching energy losses as a function of gate resistor

$E = f(R_g)$



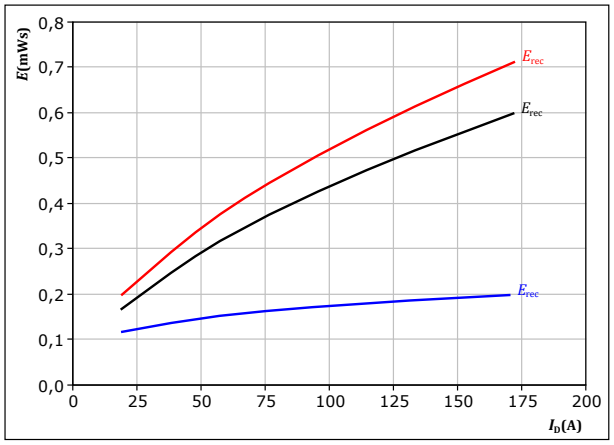
With an inductive load at

V_{DS} =	350	V	T_j:	25 °C
V_{GS} =	-4/15	V		125 °C
I_D =	95	A		150 °C

figure 14. **MOSFET**

Typical reverse recovered energy loss as a function of drain current

$E_{rec} = f(I_D)$



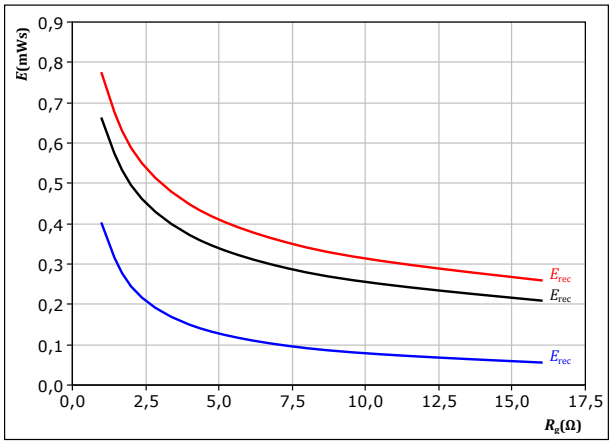
With an inductive load at

V_{DS} =	350	V	T_j:	25 °C
V_{GS} =	-4/15	V		125 °C
R_{gon} =	4	Ω		150 °C

figure 15. **MOSFET**

Typical reverse recovered energy loss as a function of gate resistor

$E_{rec} = f(R_g)$



With an inductive load at

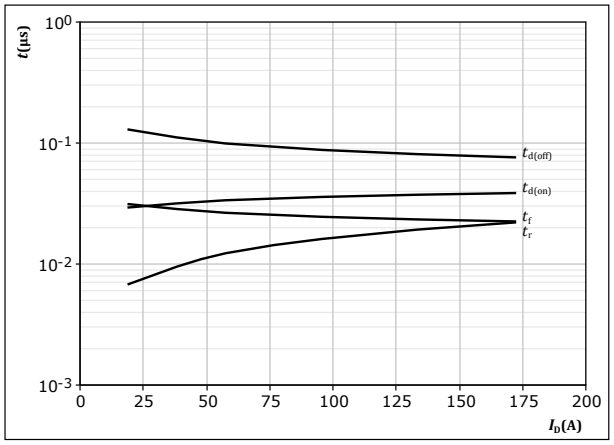
V_{DS} =	350	V	T_j:	25 °C
V_{GS} =	-4/15	V		125 °C
I_D =	95	A		150 °C

Buck Switching Characteristics

figure 16. **MOSFET**

Typical switching times as a function of drain current

$t = f(I_D)$



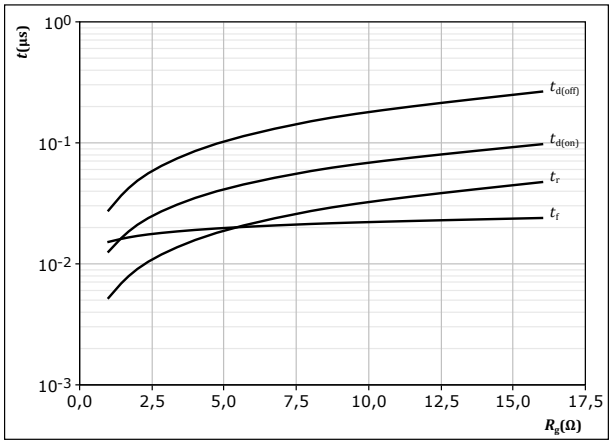
With an inductive load at

T_j =	150	°C
V_{DS} =	350	V
V_{GS} =	-4/15	V
R_{gon} =	4	Ω
R_{goff} =	4	Ω

figure 17. **MOSFET**

Typical switching times as a function of gate resistor

$t = f(R_g)$



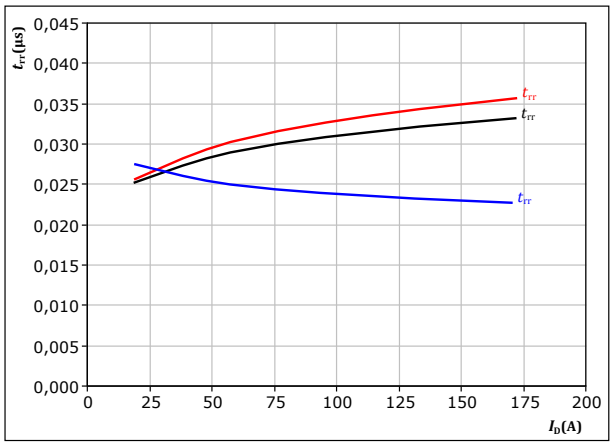
With an inductive load at

T_j =	150	°C
V_{DS} =	350	V
V_{GS} =	-4/15	V
I_D =	95	A

figure 18. **MOSFET**

Typical reverse recovery time as a function of drain current

$t_{rr} = f(I_D)$



At

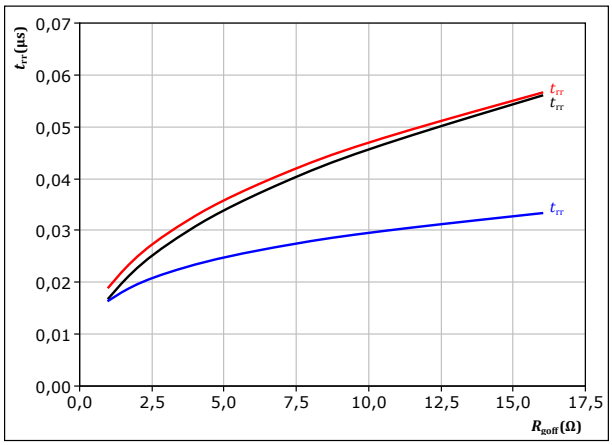
V_{DS} =	350	V
V_{GS} =	-4/15	V
R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 19. **MOSFET**

Typical reverse recovery time as a function of turn off gate resistor

$t_{rr} = f(R_{goff})$



At

V_{DS} =	350	V
V_{GS} =	-4/15	V
I_D =	95	A

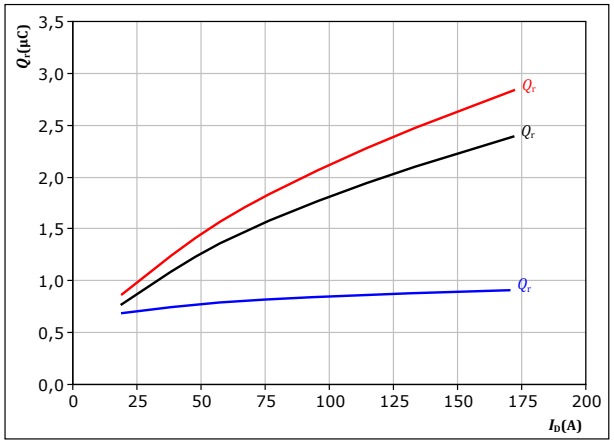
T_j: 25 °C, 125 °C, 150 °C

Buck Switching Characteristics

figure 20. **MOSFET**

Typical recovered charge as a function of drain current

$Q_r = f(I_D)$

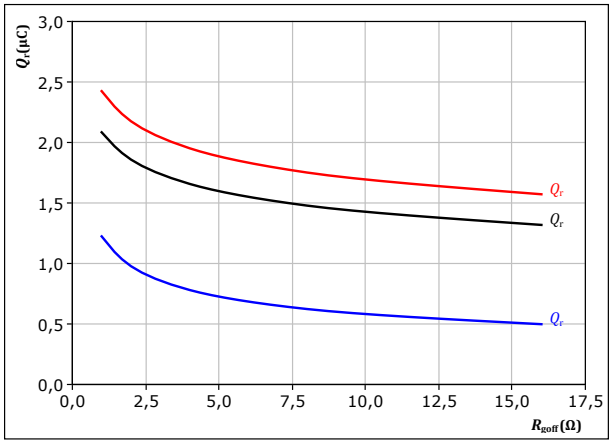


At					
	V_{DS} =	350	V		
	V_{GS} =	-4/15	V	T_j:	25 °C / 125 °C / 150 °C
	R_{gon} =	4	Ω		

figure 21. **MOSFET**

Typical recovered charge as a function of turn off gate resistor

$Q_r = f(R_{goff})$

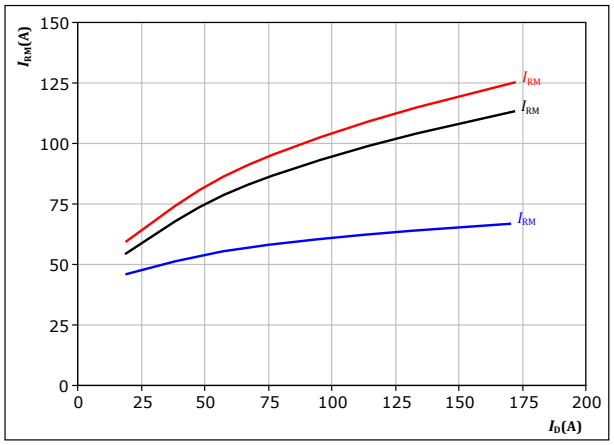


At					
	V_{DS} =	350	V		
	V_{GS} =	-4/15	V	T_j:	25 °C / 125 °C / 150 °C
	I_D =	95	A		

figure 22. **MOSFET**

Typical peak reverse recovery current as a function of drain current

$I_{RM} = f(I_D)$

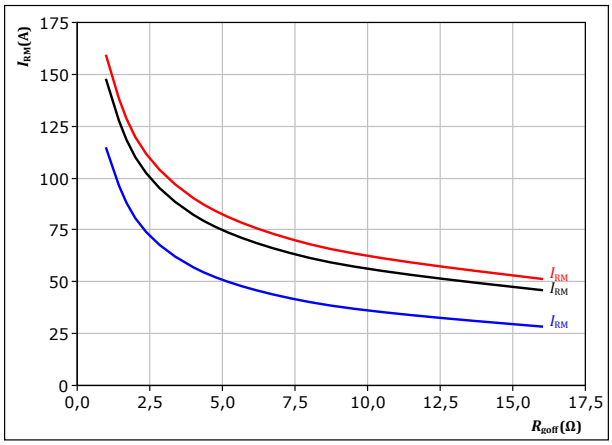


At					
	V_{DS} =	350	V		
	V_{GS} =	-4/15	V	T_j:	25 °C / 125 °C / 150 °C
	R_{gon} =	4	Ω		

figure 23. **MOSFET**

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

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



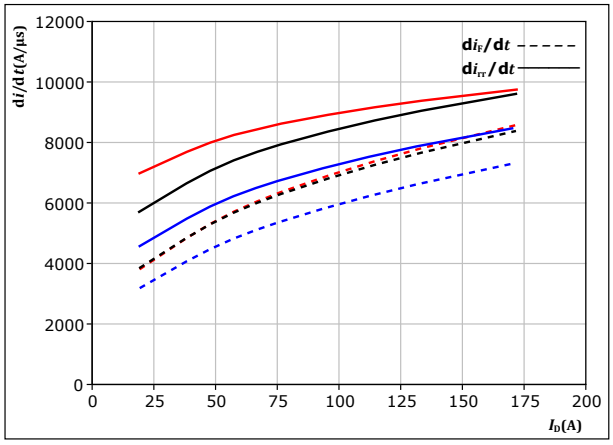
At					
	V_{DS} =	350	V		
	V_{GS} =	-4/15	V	T_j:	25 °C / 125 °C / 150 °C
	I_D =	95	A		

Buck Switching Characteristics

figure 24. **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)

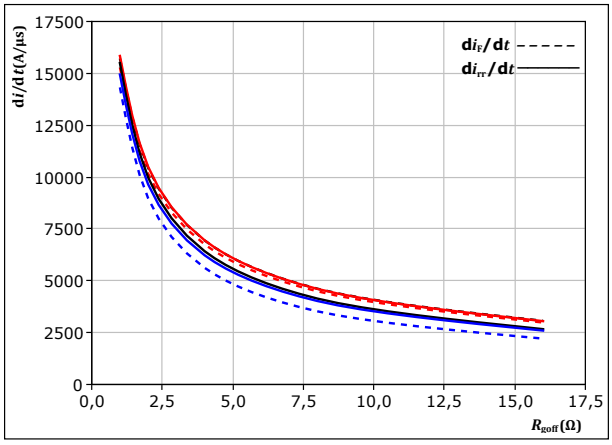


At					
	V_{DS} =	350	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	R_{gon} =	4	Ω		125 °C
					150 °C

figure 25. **MOSFET**

Typical rate of fall of forward and reverse recovery current as a function of turn off gate resistor

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

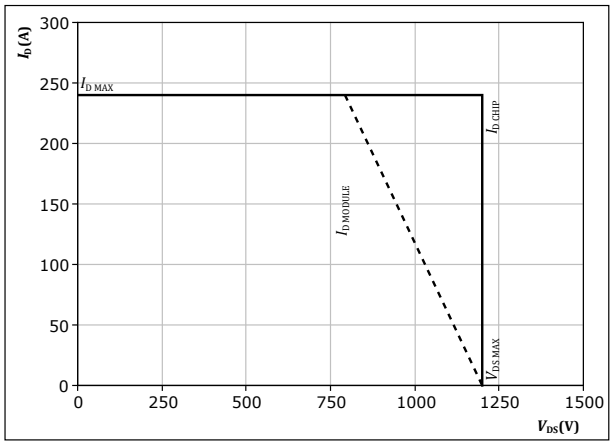


At					
	V_{DS} =	350	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	I_D =	95	A		125 °C
					150 °C

figure 26. **MOSFET**

Reverse bias safe operating area

I_D = f(V_{DS})



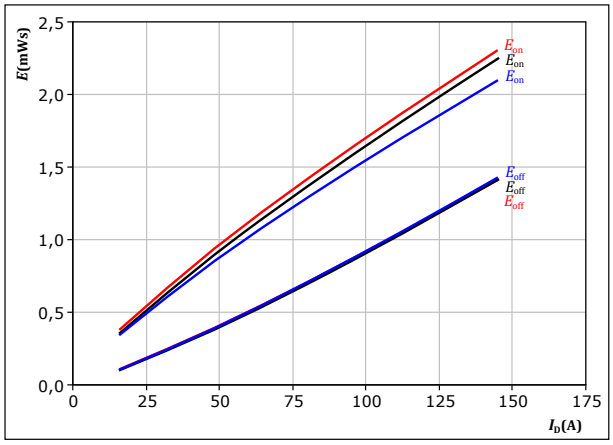
At			
	T_j =	150	°C
	R_{gon} =	4	Ω
	R_{goff} =	4	Ω

Boost Switching Characteristics

figure 27. **MOSFET**

Typical switching energy losses as a function of drain current

$E = f(I_D)$



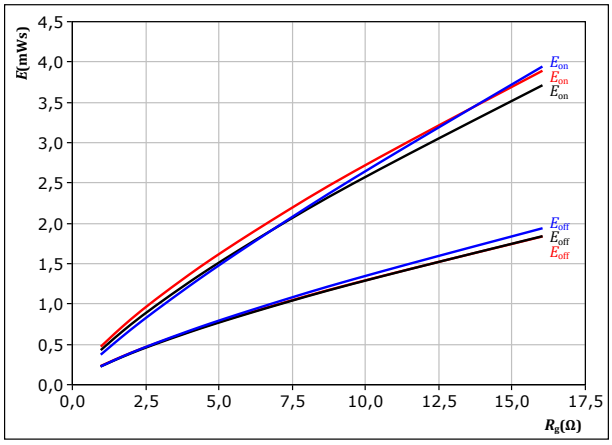
With an inductive load at

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

figure 28. **MOSFET**

Typical switching energy losses as a function of gate resistor

$E = f(R_g)$



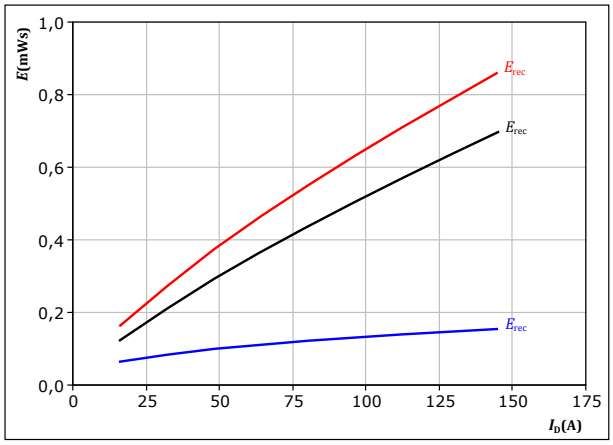
With an inductive load at

			T_j:	
V_{DS} =	600	V		25 °C
V_{GS} =	-4/15	V		125 °C
I_D =	80	A		150 °C

figure 29. **MOSFET**

Typical reverse recovered energy loss as a function of drain current

$E_{rec} = f(I_D)$



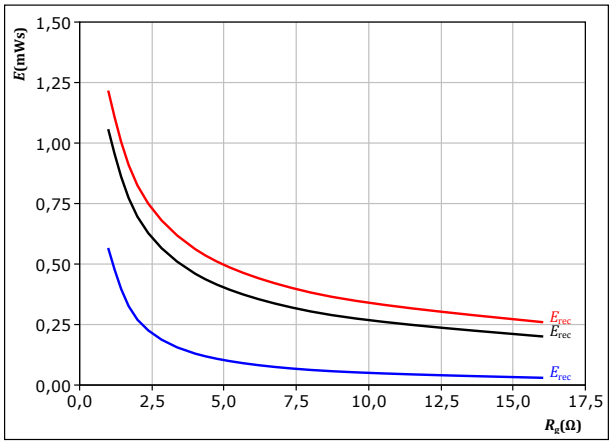
With an inductive load at

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

figure 30. **MOSFET**

Typical reverse recovered energy loss as a function of gate resistor

$E_{rec} = f(R_g)$



With an inductive load at

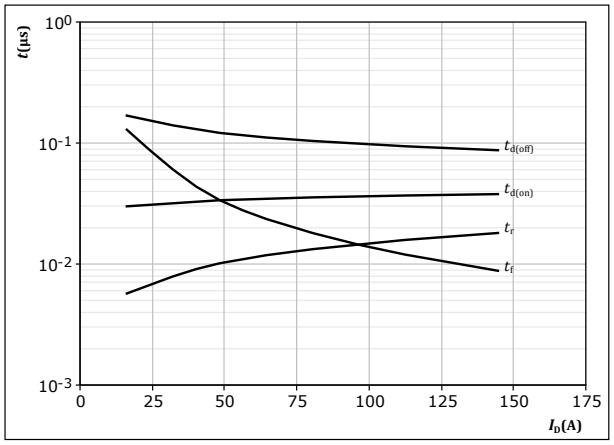
			T_j:	
V_{DS} =	600	V		25 °C
V_{GS} =	-4/15	V		125 °C
I_D =	80	A		150 °C

Boost Switching Characteristics

figure 31. **MOSFET**

Typical switching times as a function of drain current

t = f(I_D)



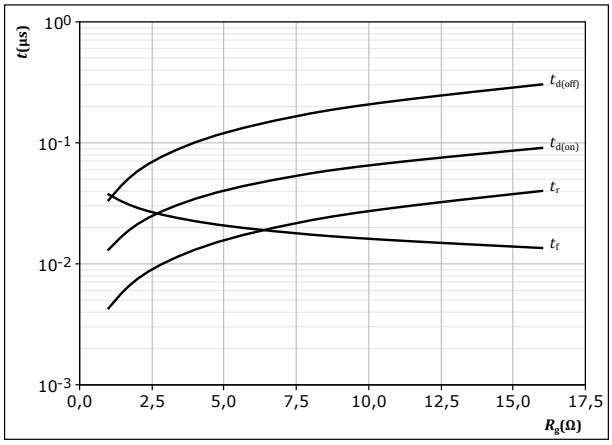
With an inductive load at

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

figure 32. **MOSFET**

Typical switching times as a function of gate resistor

t = f(R_g)



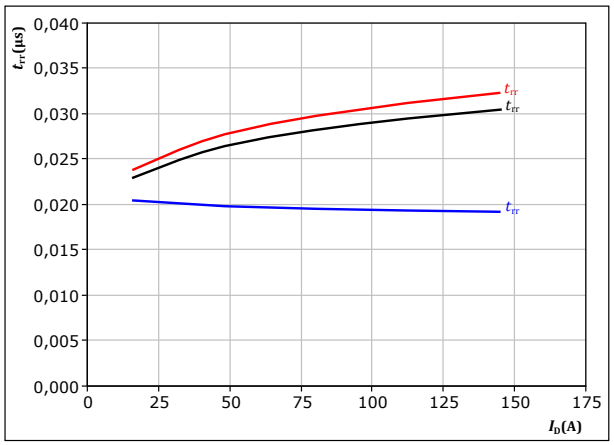
With an inductive load at

T_j =	150	°C
V_{DS} =	600	V
V_{GS} =	-4/15	V
I_D =	80	A

figure 33. **MOSFET**

Typical reverse recovery time as a function of drain current

t_{rr} = f(I_D)



At

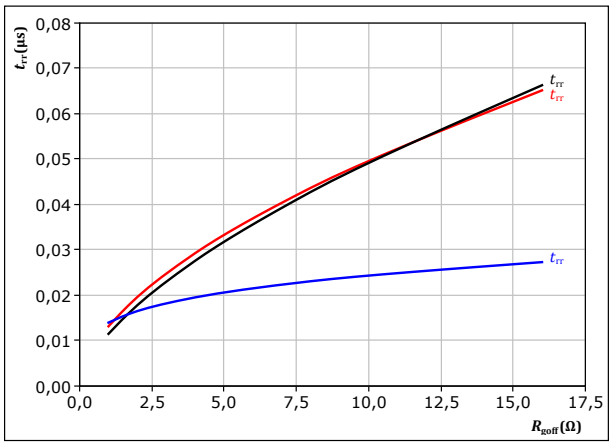
V_{DS} =	600	V
V_{GS} =	-4/15	V
R_{gon} =	4	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 34. **MOSFET**

Typical reverse recovery time as a function of turn off gate resistor

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



At

V_{DS} =	600	V
V_{GS} =	-4/15	V
I_D =	80	A

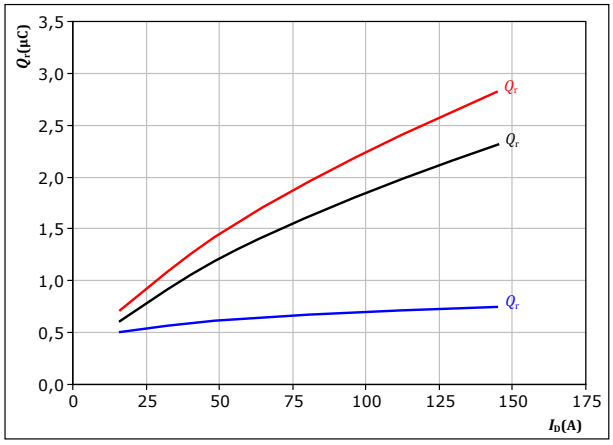
T_j: 25 °C, 125 °C, 150 °C

Boost Switching Characteristics

figure 35. **MOSFET**

Typical recovered charge as a function of drain current

$Q_r = f(I_D)$

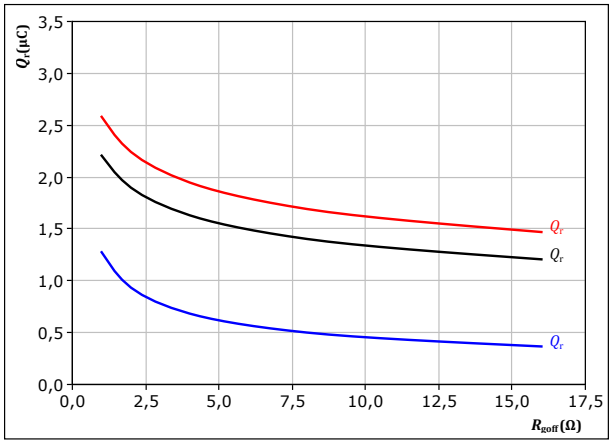


At					
	V_{DS} =	600	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	R_{gon} =	4	Ω		125 °C
					150 °C

figure 36. **MOSFET**

Typical recovered charge as a function of turn off gate resistor

$Q_r = f(R_{goff})$

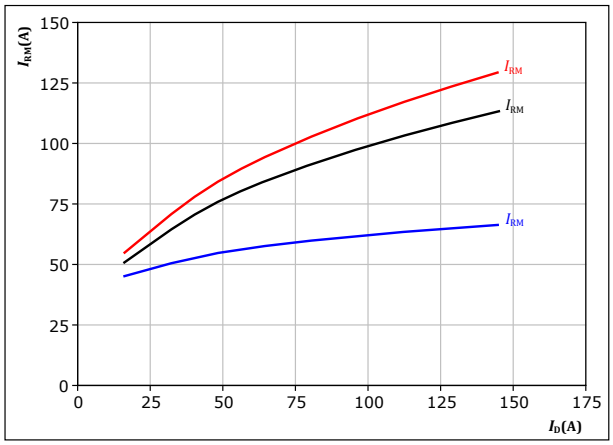


At					
	V_{DS} =	600	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	I_D =	80	A		125 °C
					150 °C

figure 37. **MOSFET**

Typical peak reverse recovery current as a function of drain current

$I_{RM} = f(I_D)$

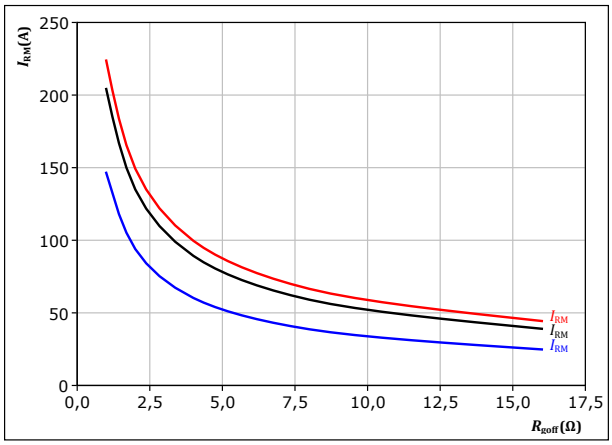


At					
	V_{DS} =	600	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	R_{gon} =	4	Ω		125 °C
					150 °C

figure 38. **MOSFET**

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

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



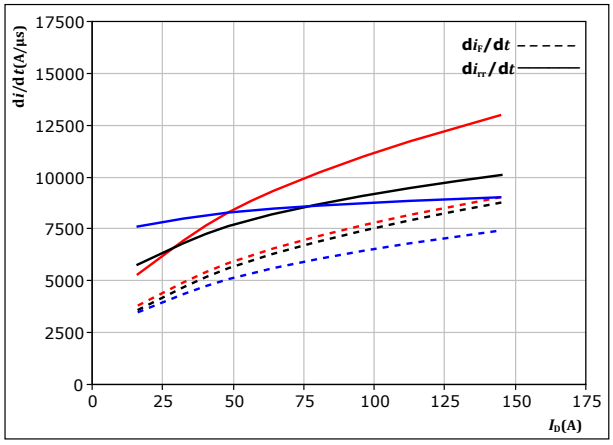
At					
	V_{DS} =	600	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	I_D =	80	A		125 °C
					150 °C

Boost Switching Characteristics

figure 39. **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)

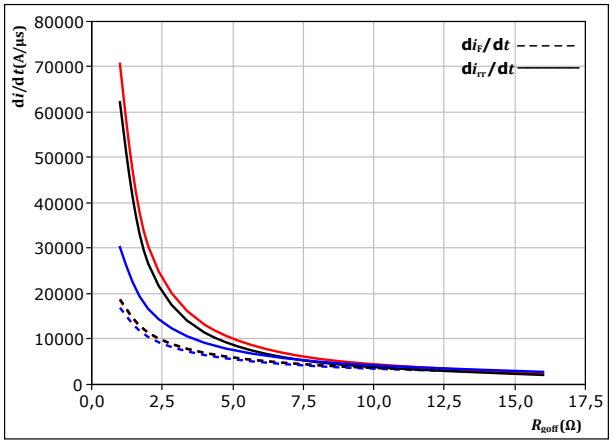


At					
	V_{DS} =	600	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	R_{gon} =	4	Ω		125 °C
					150 °C

figure 40. **MOSFET**

Typical rate of fall of forward and reverse recovery current as a function of turn off gate resistor

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

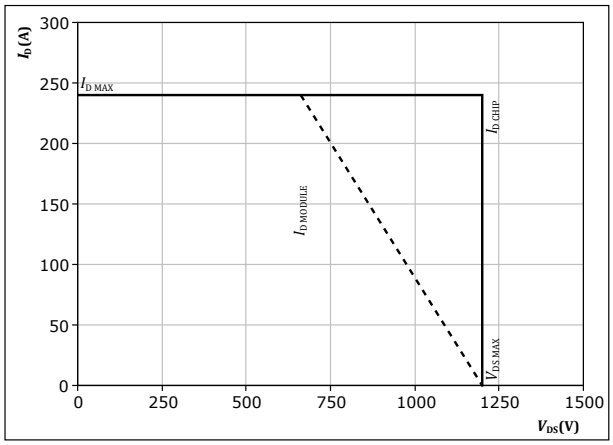


At					
	V_{DS} =	600	V		
	V_{GS} =	-4/15	V	T_j:	25 °C
	I_D =	80	A		125 °C
					150 °C

figure 41. **MOSFET**

Reverse bias safe operating area

I_D = f(V_{DS})



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

Switching Definitions

figure 42. MOSFET

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

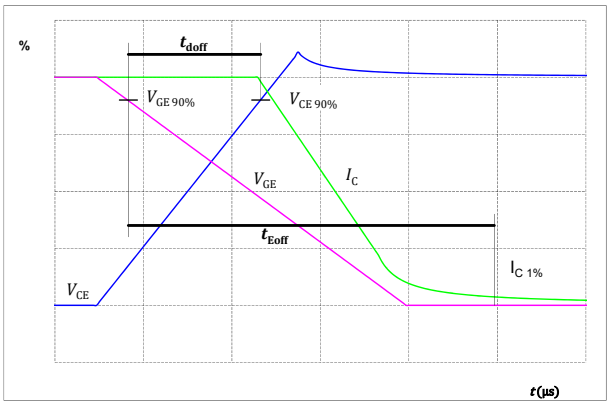


figure 43. MOSFET

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

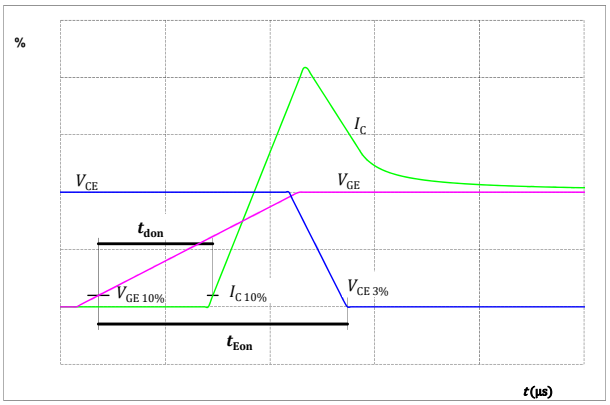


figure 44. MOSFET

Turn-off Switching Waveforms & definition of t_f

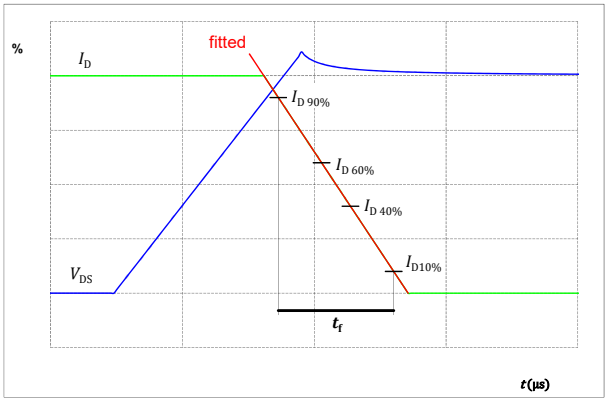
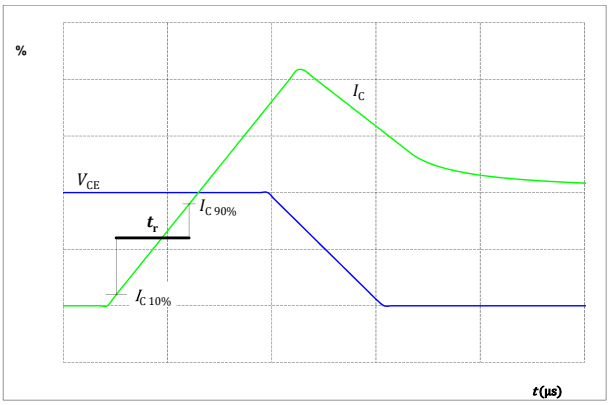


figure 45. MOSFET

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 46. **FWD**

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

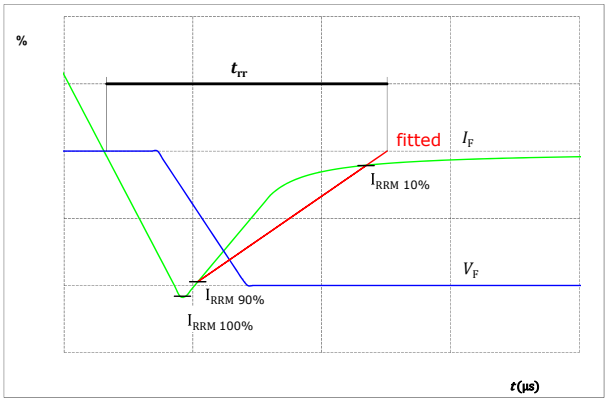


figure 47. **FWD**

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

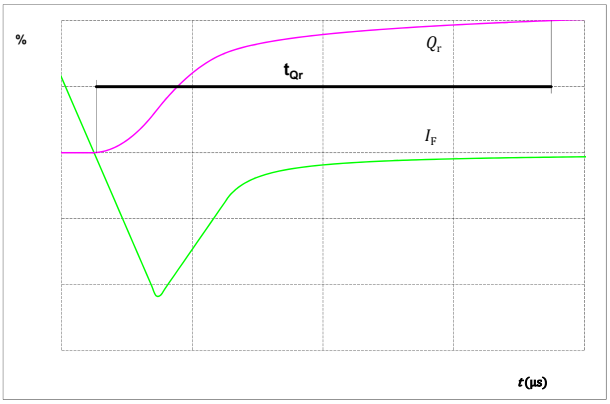
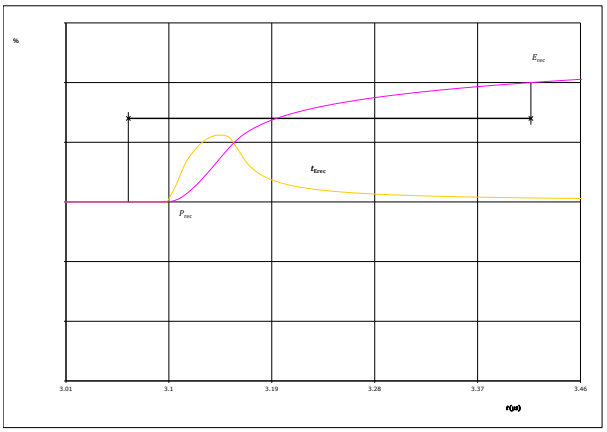


figure 48. **FWD**

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



Ordering Code

Version	Ordering Code
Without thermal paste	10-EY12NMA011ME30-LS28F18T
With thermal paste (3,4 W/mK, PSX-P7)	10-EY12NMA011ME30-LS28F18T-/3/

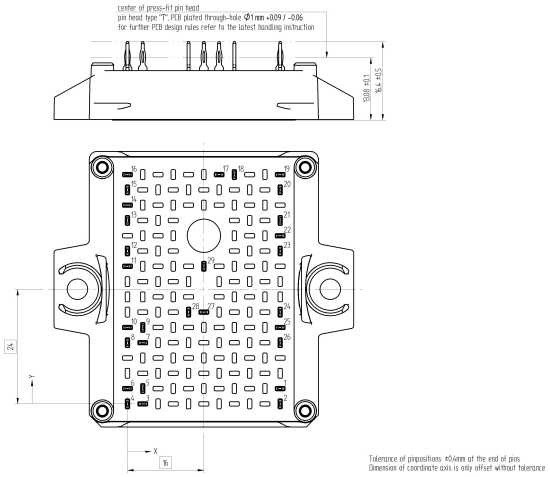
Marking

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

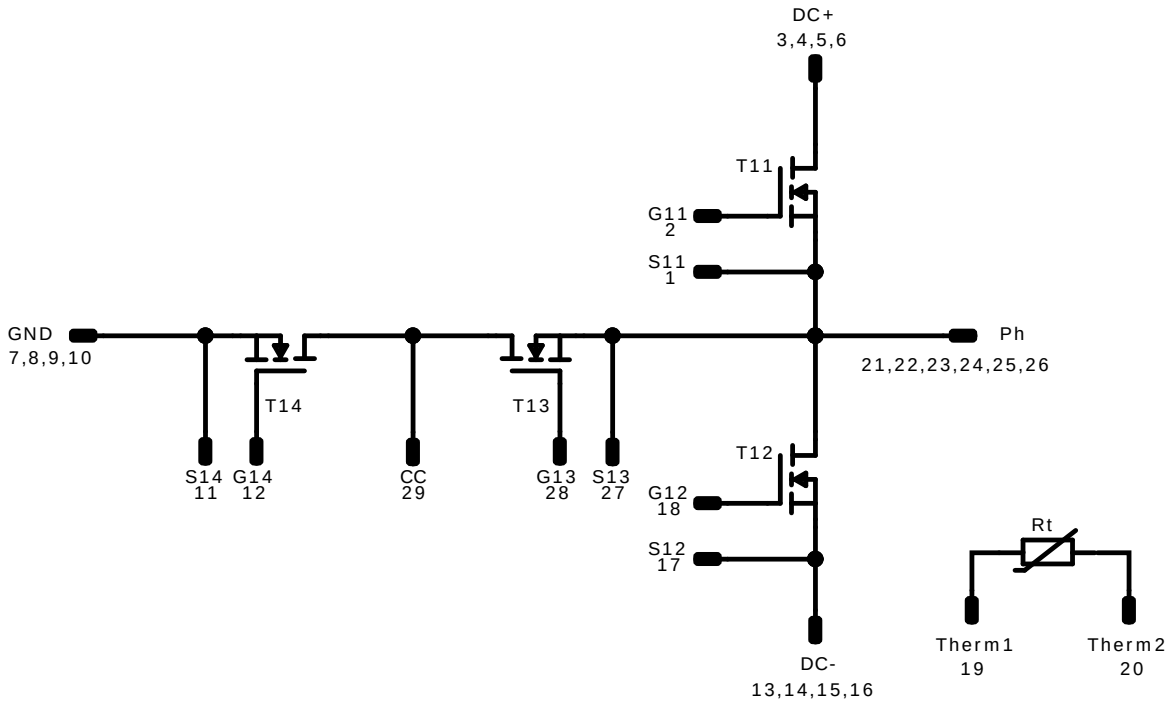
Outline

Pin table [mm]

Pin	X	Y	Function
1	32	3,2	S11
2	32	0	G11
3	3,2	0	DC+
4	0	0	DC+
5	3,2	3,2	DC+
6	0	3,2	DC+
7	3,2	12,8	GND
8	0	12,8	GND
9	3,2	16	GND
10	0	16	GND
11	0	28,8	S14
12	0	32	G14
13	0	38,4	DC-
14	0	41,6	DC-
15	0	44,8	DC-
16	0	48	DC-
17	19,2	48	S12
18	22,4	48	G12
19	32	48	Therm1
20	32	44,8	Therm2
21	32	38,4	Ph
22	32	35,2	Ph
23	32	32	Ph
24	32	19,2	Ph
25	32	16	Ph
26	32	12,8	Ph
27	16	19,2	S13
28	12,8	19,2	G13
29	16	28,8	CC



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12	MOSFET	1200 V	10,67 mΩ	Buck Switch	
T13, T14	MOSFET	1200 V	10,67 mΩ	Boost Switch	
Rt	Thermistor			Thermistor	

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

Handling instruction
Handling instructions for *flow* E2 packages see vincotech.com website.

Package data
Package data for *flow* E2 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 certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
10-EY12NMA011ME30-LS28F18T-D1-14	12 Oct. 2021		