Vincotech

10-EY12NMA009MS-LS28F78T
datasheet

flowMNPC E2 SiC **1200 V / 8,5 mΩ**

Topology features

- Kelvin Emitter for improved switching performance
- Temperature sensor
- Mixed Voltage Neutral Point Clamped Topology (T-Type)

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

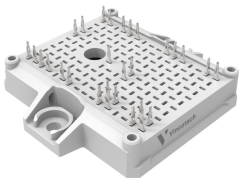
Target applications

- Charging Stations
- Industrial Drives
- Power Supply
- Solar Inverters
- UPS

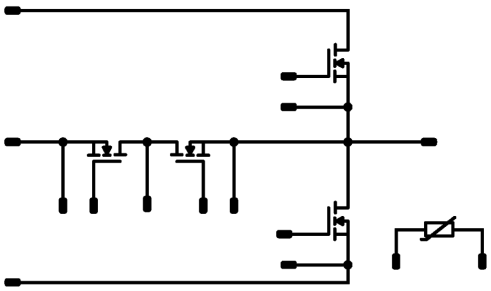
Types

- 10-EY12NMA009MS-LS28F78T

flow E2 12 mm housing



Schematic



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	124	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	568	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	180	W
Gate-source voltage	V_{GSS}	static	-5 / 18	V
		dynamic	-10 / 22	V
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	124	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	568	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	180	W
Gate-source voltage	V_{GSS}	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 s	6000	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(1)	$r_{DS(on)}$		18		142	25 175		8,5 13,5	12,5	mΩ
Gate-source threshold voltage	$V_{GS(th)}$				0,0142	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							0,5		Ω
Gate charge	Q_g		-5/18	800	142	25		376		nC
Short-circuit input capacitance	C_{iss}	f = 500 kHz	0	800	0	25		9360		pF
Short-circuit output capacitance	C_{oss}							470		
Reverse transfer capacitance	C_{rss}							16		
Diode forward voltage	V_{SD}		-5		142	25		4,1		V
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,53		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} = 2 Ω R_{goff} = 2 Ω	-5/18	350	140	25 125 150		30,01 27,75 27,33		ns
Rise time	t_r					25 125 150		15,37 13,69 13,45		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		41,47 46,74 48,09		ns
Fall time	t_f					25 125 150		9,63 10,57 11,27		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,978 µC Q_{rFWD}=2,38 µC Q_{rFWD}=2,76 µC				25 125 150		0,195 0,207 0,219		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,505 0,51 0,517		mWs
Peak recovery current	I_{RRM}	di/dt=7132 A/µs di/dt=7172 A/µs di/dt=8825 A/µs				25 125 150		70,05 108,17 116,75		A
Reverse recovery time	t_{rr}					25 125 150		23,43 33,94 36,23		ns
Recovered charge	Q_r					25 125 150		0,978 2,38 2,76		µC
Reverse recovered energy	E_{rec}					25 125 150		0,146 0,449 0,527		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		7908,88 10310,78 10086,34		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(1)	$r_{DS(on)}$		18		142	25 175		8,5 13,5	12,5	mΩ
Gate-source threshold voltage	$V_{GS(th)}$				0,0142	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							0,5		Ω
Gate charge	Q_g		-5/18	800	142	25		376		nC
Short-circuit input capacitance	C_{iss}	f = 500 kHz	0	800	0	25		9360		pF
Short-circuit output capacitance	C_{oss}							470		
Reverse transfer capacitance	C_{rss}							16		
Diode forward voltage	V_{SD}		-5		142	25		4,1		V
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,53		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} = 2 Ω R_{goff} = 2 Ω	-5/18	350	140	25 125 150		27,03 24,84 24,42		ns
Rise time	t_r					25 125 150		18,13 17,28 17,38		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		41,54 46,11 47,35		ns
Fall time	t_f					25 125 150		7,4 7,64 7,69		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=1,22 µC Q_{rFWD}=2,61 µC Q_{rFWD}=2,99 µC				25 125 150		0,095 0,072 0,072		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,234 0,273 0,285		mWs
Peak recovery current	I_{RRM}	di/dt=7649 A/µs di/dt=8171 A/µs di/dt=7776 A/µs				25 125 150		86,18 116,25 124,08		A
Reverse recovery time	t_{rr}					25 125 150		23,44 34,13 36,58		ns
Recovered charge	Q_r					25 125 150		1,22 2,61 2,99		µC
Reverse recovered energy	E_{rec}					25 125 150		0,256 0,571 0,66		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		12341,97 10515,47 10160,21		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} = 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	

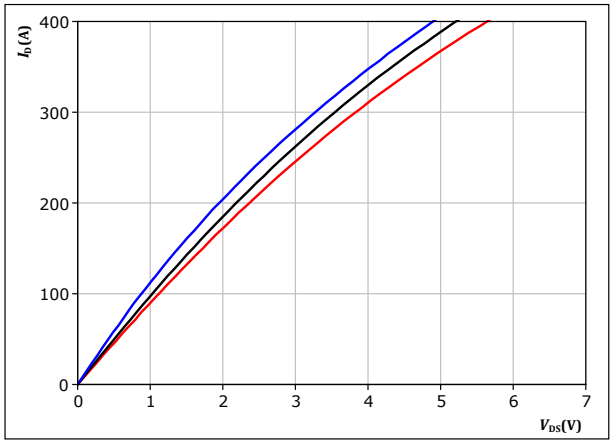
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

Buck Switch Characteristics

figure 1. **MOSFET**

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

$I_D = f(V_{DS})$

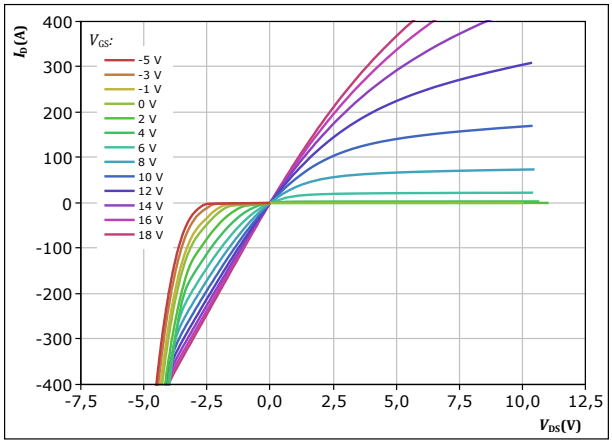


t_p =	250	µs		
V_{GS} =	18	V	T_j:	25 °C
				125 °C
				150 °C

figure 2. **MOSFET**

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

$I_D = f(V_{DS})$



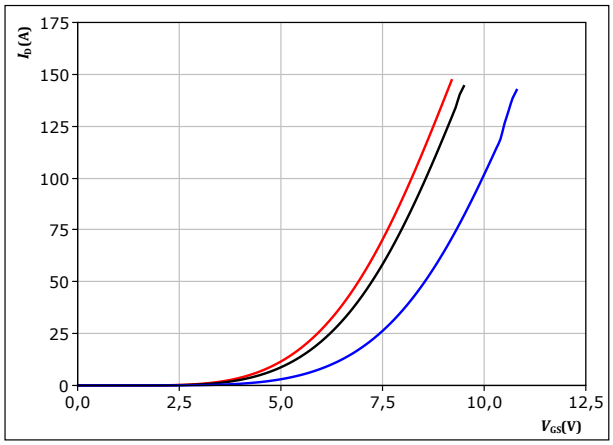
t_p =	250	µs
T_j =	150	°C

V_{GS} from -5 V to 18 V in steps of 2 V

figure 3. **MOSFET**

Typical transfer characteristics

$I_D = f(V_{GS})$

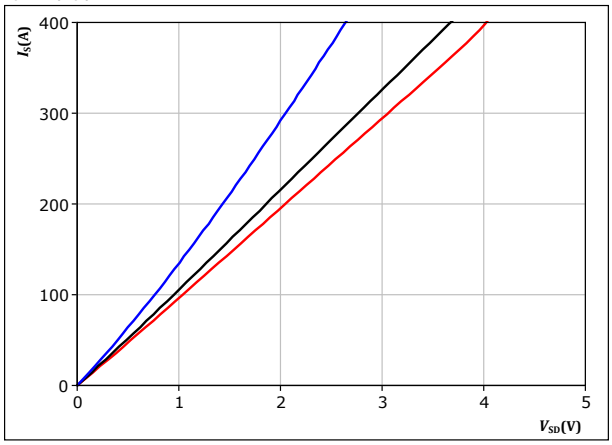


t_p =	250	µs		
V_{DS} =	42	V	T_j:	25 °C
				125 °C
				150 °C

figure 4. **MOSFET**

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

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



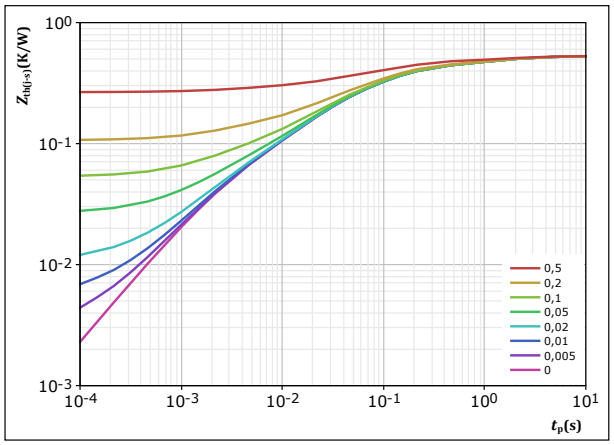
t_p =	250	µs		
V_{GS} =	18	V	T_j:	25 °C
				125 °C
				150 °C

Buck 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

$R_{th(j-s)} =$ 0,528 K/W

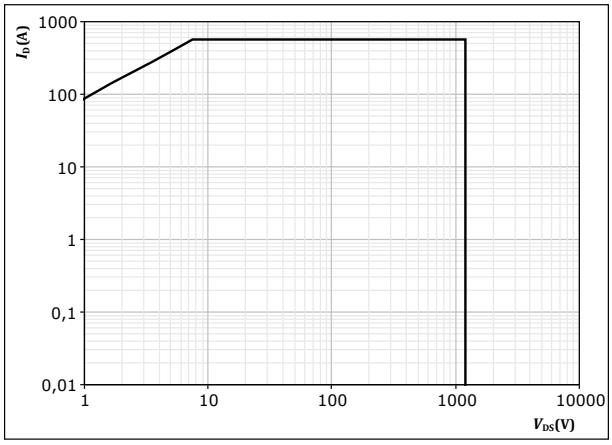
MOSFET thermal model values

R (K/W)	τ (s)
2,50E-02	5,66E+00
9,77E-02	1,03E+00
2,43E-01	1,04E-01
1,32E-01	2,14E-02
3,42E-02	2,33E-03

figure 6. **MOSFET**

Safe operating area

$I_D = f(V_{DS})$



$D =$ single pulse

$T_s =$ 80 °C

$V_{GS} =$ 18 V

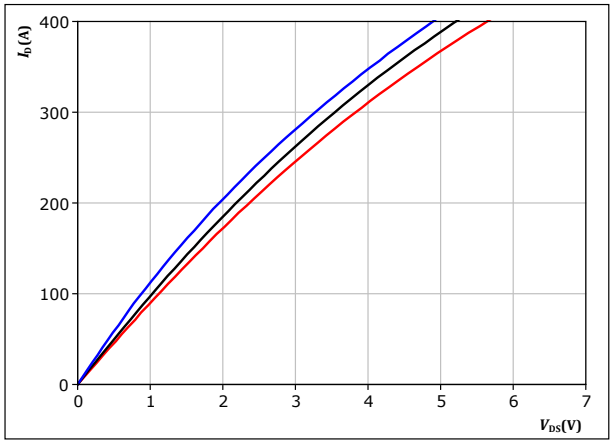
$T_j =$ T_{jmax}

Boost Switch Characteristics

figure 7. **MOSFET**

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

$I_D = f(V_{DS})$

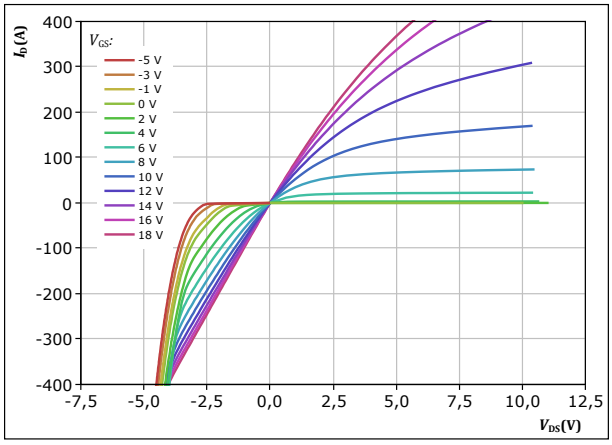


t_p =	250	µs		
V_{GS} =	18	V	T_j:	25 °C
				125 °C
				150 °C

figure 8. **MOSFET**

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

$I_D = f(V_{DS})$



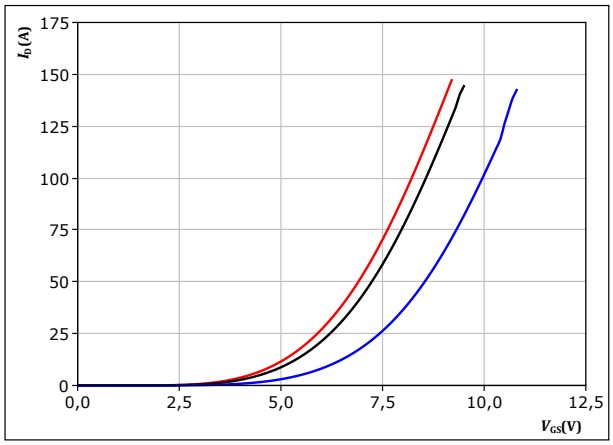
t_p =	250	µs
T_j =	150	°C

V_{GS} from -5 V to 18 V in steps of 2 V

figure 9. **MOSFET**

Typical transfer characteristics

$I_D = f(V_{GS})$

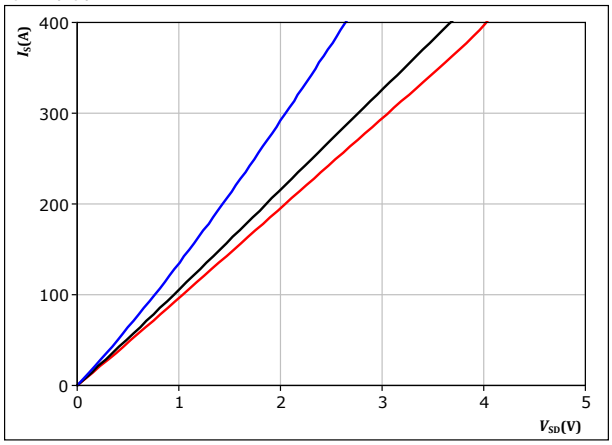


t_p =	250	µs		
V_{DS} =	42	V	T_j:	25 °C
				125 °C
				150 °C

figure 10. **MOSFET**

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

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



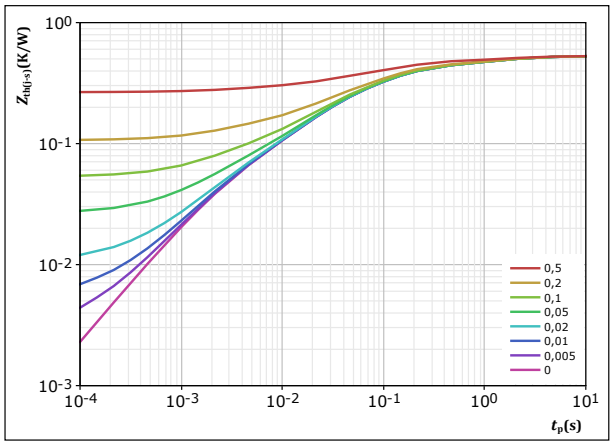
t_p =	250	µs		
V_{GS} =	18	V	T_j:	25 °C
				125 °C
				150 °C

Boost Switch Characteristics

figure 11. **MOSFET**

Transient thermal impedance as a function of pulse width

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



$D =$ t_p / T

$R_{th(j-s)} =$ 0,528 K/W

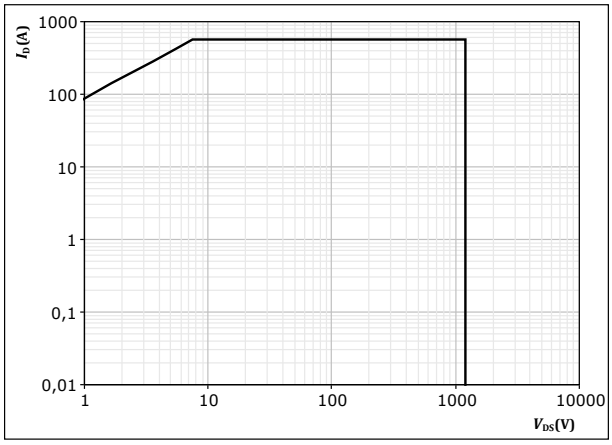
MOSFET thermal model values

R (K/W)	τ (s)
2,50E-02	5,66E+00
9,77E-02	1,03E+00
2,43E-01	1,04E-01
1,32E-01	2,14E-02
3,42E-02	2,33E-03

figure 12. **MOSFET**

Safe operating area

$I_D = f(V_{DS})$



$D =$ single pulse

$T_s =$ 80 °C

$V_{GS} =$ 18 V

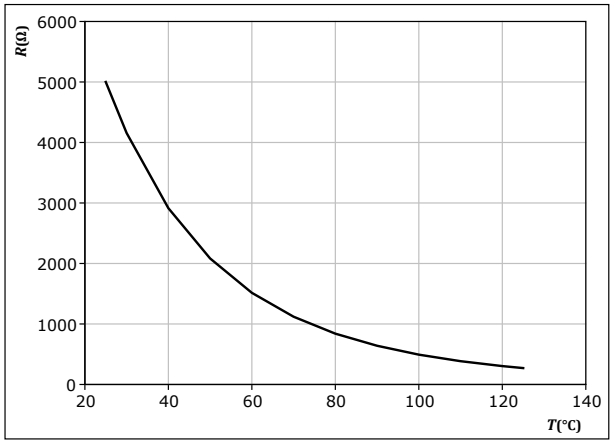
$T_j =$ T_{jmax}

Thermistor Characteristics

figure 13. **Thermistor**

Typical NTC characteristic as function of temperature

$R_T = f(T)$

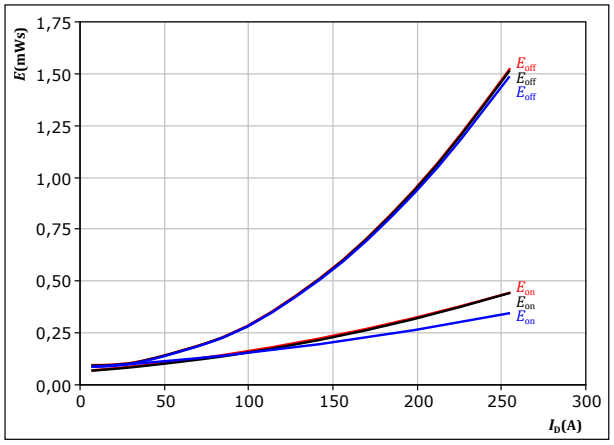


Buck Switching Characteristics

figure 14. **MOSFET**

Typical switching energy losses as a function of drain current

$E = f(I_D)$



With an inductive load at

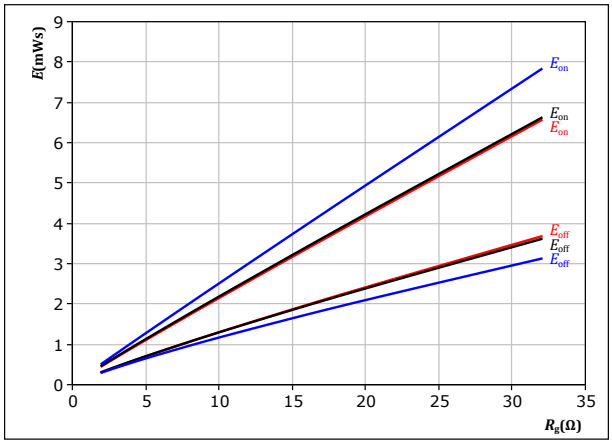
V_{DS} =	350	V	
V_{GS} =	-5/18	V	
R_{gon} =	2	Ω	
R_{goff} =	2	Ω	

T_j: 25 °C, 125 °C, 150 °C

figure 15. **MOSFET**

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

$E = f(R_g)$



With an inductive load at

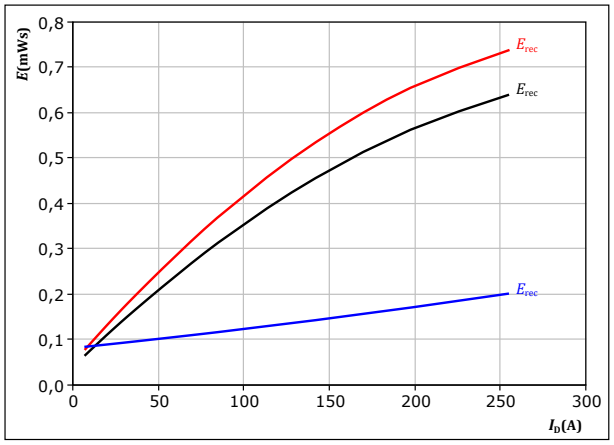
V_{DS} =	350	V	
V_{GS} =	-5/18	V	
I_D =	140	A	

T_j: 25 °C, 125 °C, 150 °C

figure 16. **MOSFET**

Typical reverse recovered energy loss as a function of drain current

$E_{rec} = f(I_D)$



With an inductive load at

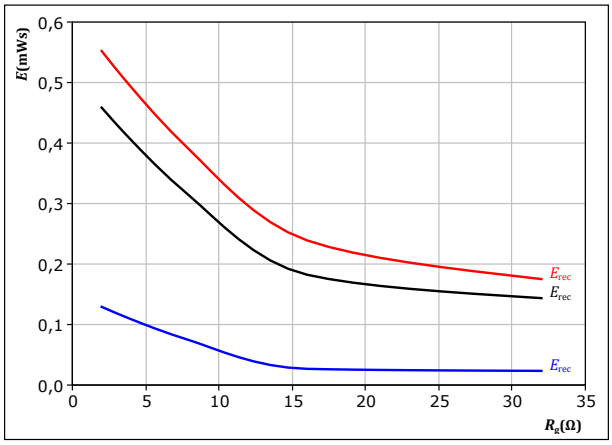
V_{DS} =	350	V	
V_{GS} =	-5/18	V	
R_{gon} =	2	Ω	

T_j: 25 °C, 125 °C, 150 °C

figure 17. **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} =	350	V	
V_{GS} =	-5/18	V	
I_D =	140	A	

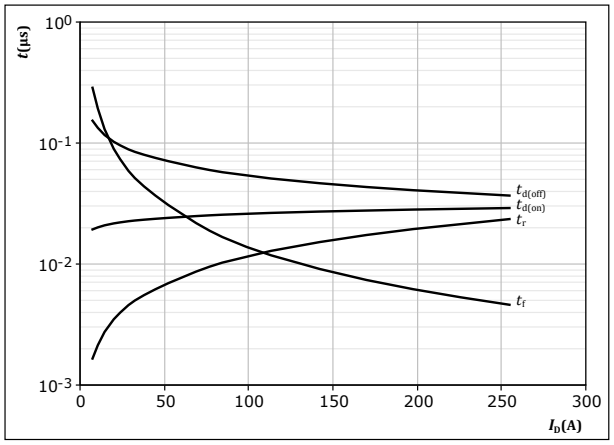
T_j: 25 °C, 125 °C, 150 °C

Buck Switching Characteristics

figure 18. **MOSFET**

Typical switching times as a function of drain current

$t = f(I_D)$



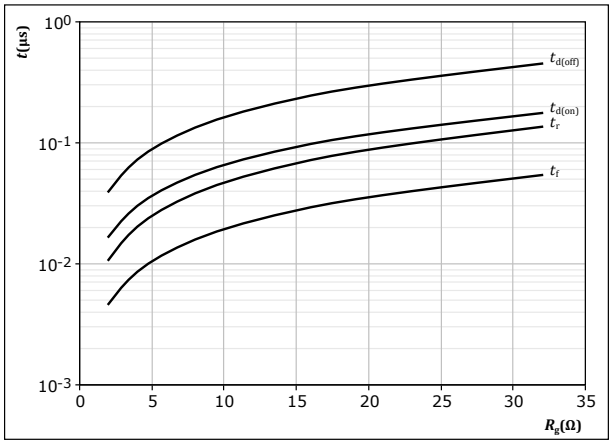
With an inductive load at

$T_j =$	150	°C
$V_{DS} =$	350	V
$V_{GS} =$	-5/18	V
$R_{gon} =$	2	Ω
$R_{goff} =$	2	Ω

figure 19. **MOSFET**

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

$t = f(R_g)$



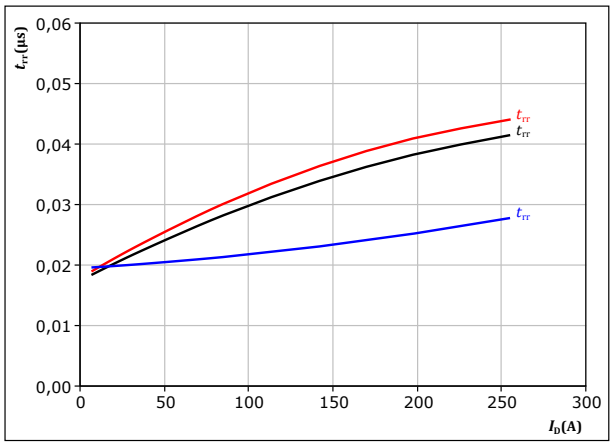
With an inductive load at

$T_j =$	150	°C
$V_{DS} =$	350	V
$V_{GS} =$	-5/18	V
$I_D =$	140	A

figure 20. **MOSFET**

Typical reverse recovery time as a function of drain current

$t_{rr} = f(I_D)$



At

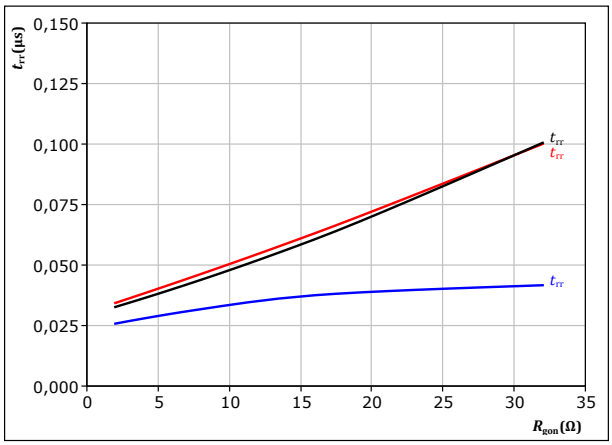
$V_{DS} =$	350	V
$V_{GS} =$	-5/18	V
$R_{gon} =$	2	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 21. **MOSFET**

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

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



At

$V_{DS} =$	350	V
$V_{GS} =$	-5/18	V
$I_D =$	140	A

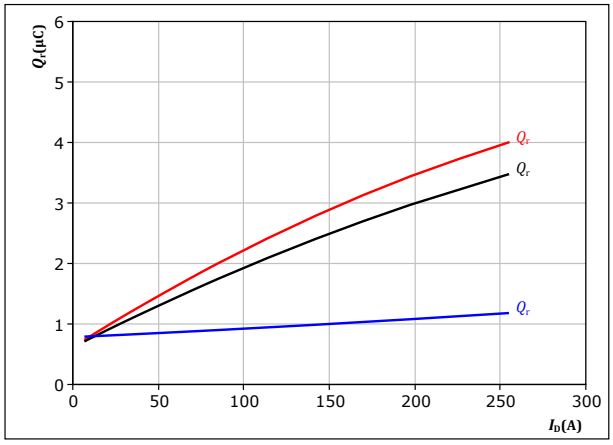
T_j: 25 °C, 125 °C, 150 °C

Buck Switching Characteristics

figure 22. **MOSFET**

Typical recovered charge as a function of drain current

$Q_r = f(I_D)$

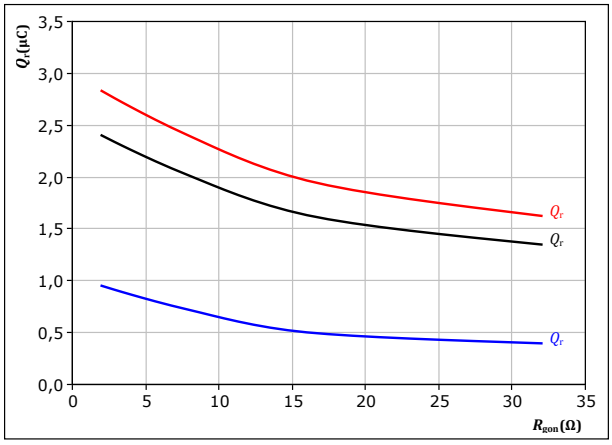


At				T_j:	
	V_{DS} =	350	V		25 °C
	V_{GS} =	-5/18	V		125 °C
	R_{gon} =	2	Ω		150 °C

figure 23. **MOSFET**

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

$Q_r = f(R_{gon})$

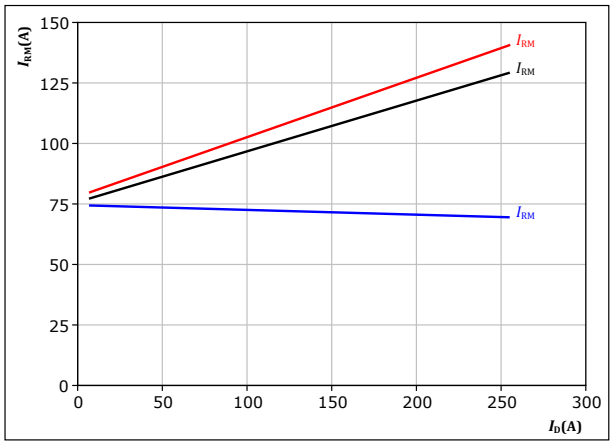


At				T_j:	
	V_{DS} =	350	V		25 °C
	V_{GS} =	-5/18	V		125 °C
	I_D =	140	A		150 °C

figure 24. **MOSFET**

Typical peak reverse recovery current as a function of drain current

$I_{RM} = f(I_D)$

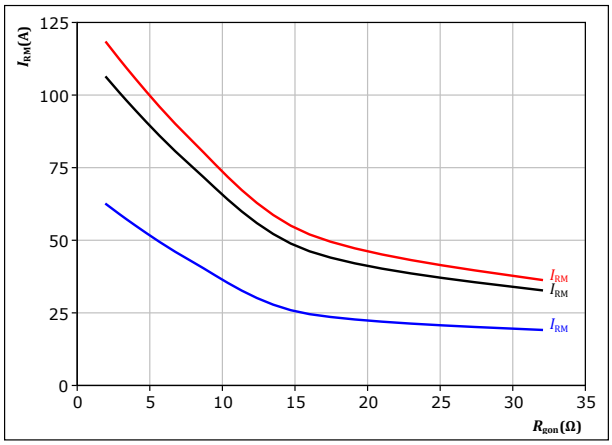


At				T_j:	
	V_{DS} =	350	V		25 °C
	V_{GS} =	-5/18	V		125 °C
	R_{gon} =	2	Ω		150 °C

figure 25. **MOSFET**

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

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



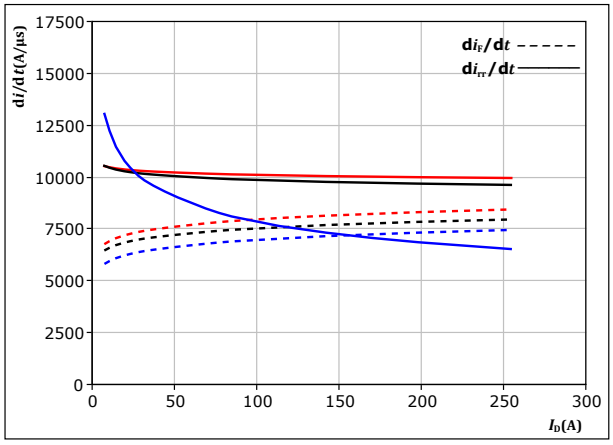
At				T_j:	
	V_{DS} =	350	V		25 °C
	V_{GS} =	-5/18	V		125 °C
	I_D =	140	A		150 °C

Buck Switching Characteristics

figure 26. **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)

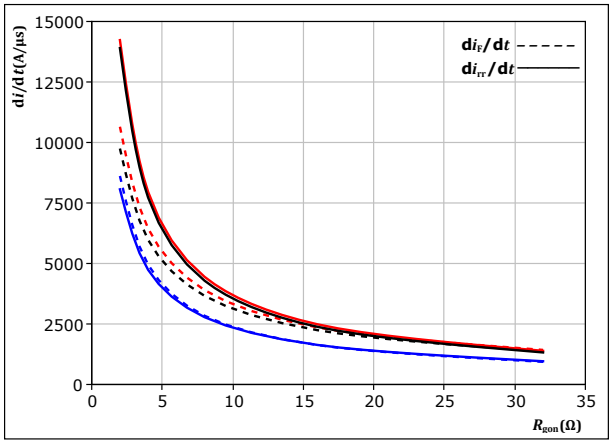


At	V_{DS} =	350	V		
	V_{GS} =	-5/18	V	T_j:	25 °C
	R_{gon} =	2	Ω		125 °C
					150 °C

figure 27. **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})

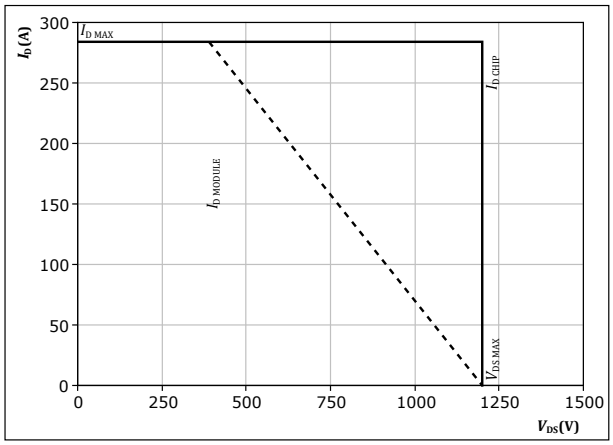


At	V_{DS} =	350	V		
	V_{GS} =	-5/18	V	T_j:	25 °C
	I_D =	140	A		125 °C
					150 °C

figure 28. **MOSFET**

Reverse bias safe operating area

I_D = f(V_{DS})



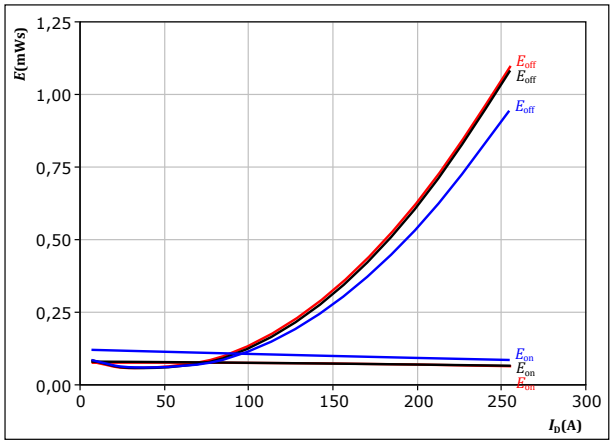
At	T_j =	150	°C
	R_{gon} =	2	Ω
	R_{goff} =	2	Ω

Boost Switching Characteristics

figure 29. **MOSFET**

Typical switching energy losses as a function of drain current

$E = f(I_D)$



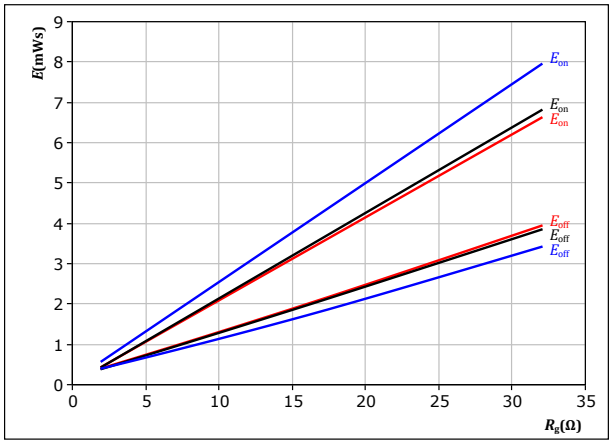
With an inductive load at

V_{DS} =	350	V	T_j: 25 °C
V_{GS} =	-5/18	V	125 °C
R_{gon} =	2	Ω	150 °C
R_{goff} =	2	Ω	

figure 30. **MOSFET**

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

$E = f(R_g)$



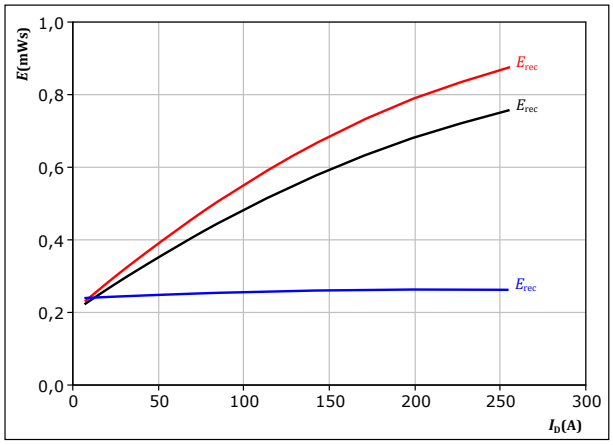
With an inductive load at

V_{DS} =	350	V	T_j: 25 °C
V_{GS} =	-5/18	V	125 °C
I_D =	140	A	150 °C

figure 31. **MOSFET**

Typical reverse recovered energy loss as a function of drain current

$E_{rec} = f(I_D)$



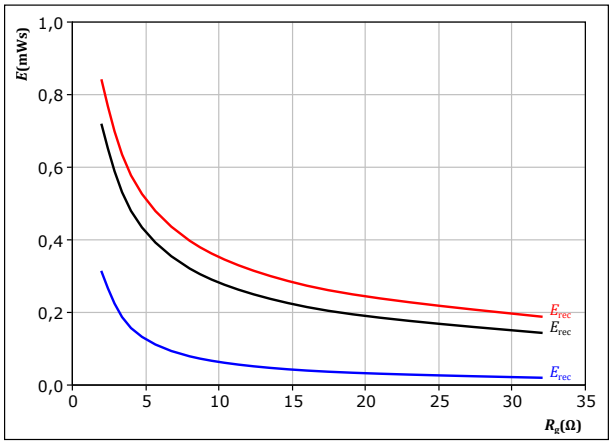
With an inductive load at

V_{DS} =	350	V	T_j: 25 °C
V_{GS} =	-5/18	V	125 °C
R_{gon} =	2	Ω	150 °C

figure 32. **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

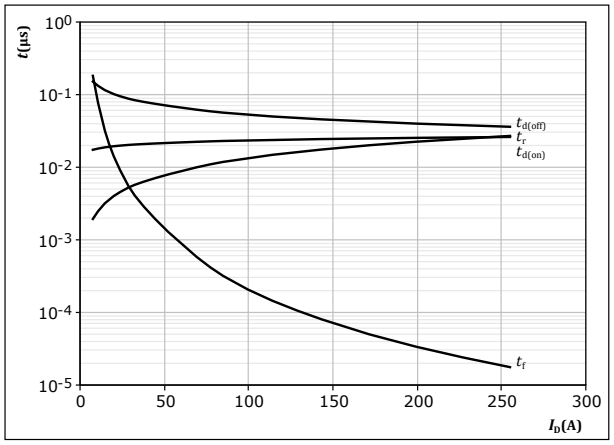
V_{DS} =	350	V	T_j: 25 °C
V_{GS} =	-5/18	V	125 °C
I_D =	140	A	150 °C

Boost Switching Characteristics

figure 33. **MOSFET**

Typical switching times as a function of drain current

t = f(I_D)



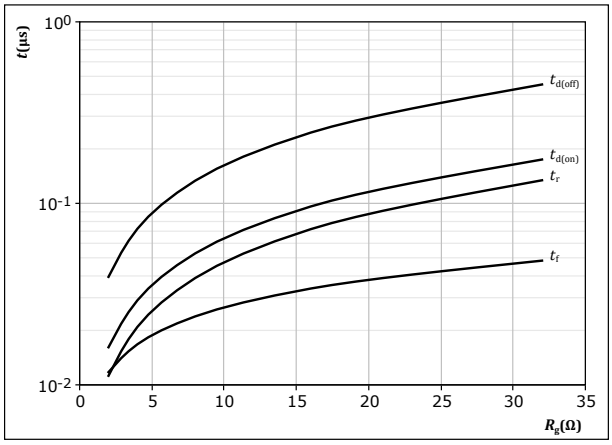
With an inductive load at

T_j =	150	°C
V_{DS} =	350	V
V_{GS} =	-5/18	V
R_{gon} =	2	Ω
R_{goff} =	2	Ω

figure 34. **MOSFET**

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

t = f(R_g)



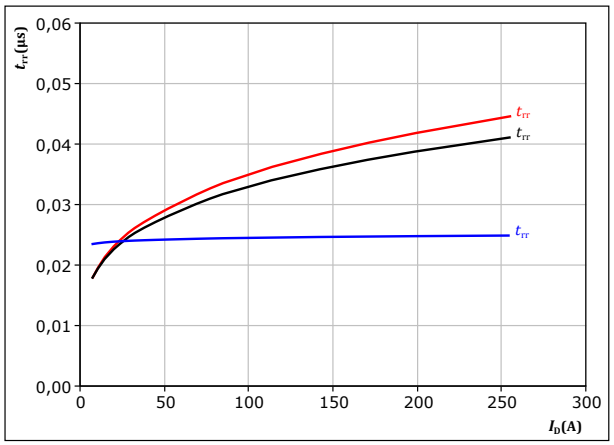
With an inductive load at

T_j =	150	°C
V_{DS} =	350	V
V_{GS} =	-5/18	V
I_D =	140	A

figure 35. **MOSFET**

Typical reverse recovery time as a function of drain current

t_{rr} = f(I_D)



At

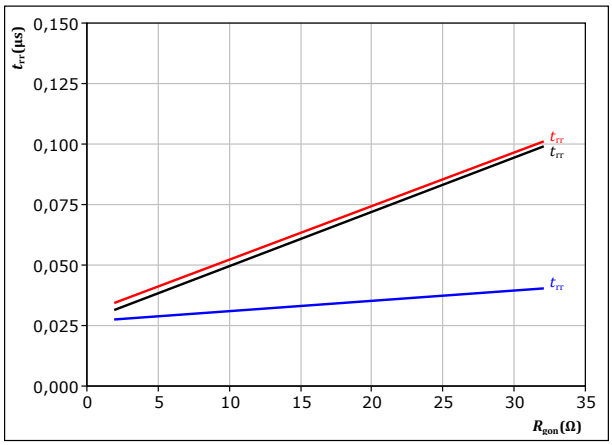
V_{DS} =	350	V
V_{GS} =	-5/18	V
R_{gon} =	2	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 36. **MOSFET**

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

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



At

V_{DS} =	350	V
V_{GS} =	-5/18	V
I_D =	140	A

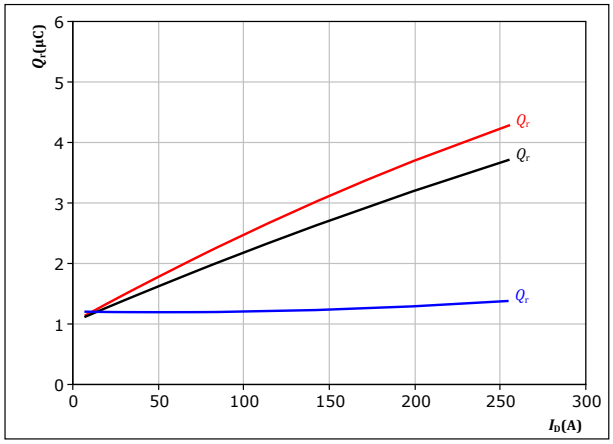
T_j: 25 °C, 125 °C, 150 °C

Boost Switching Characteristics

figure 37. **MOSFET**

Typical recovered charge as a function of drain current

$Q_r = f(I_D)$

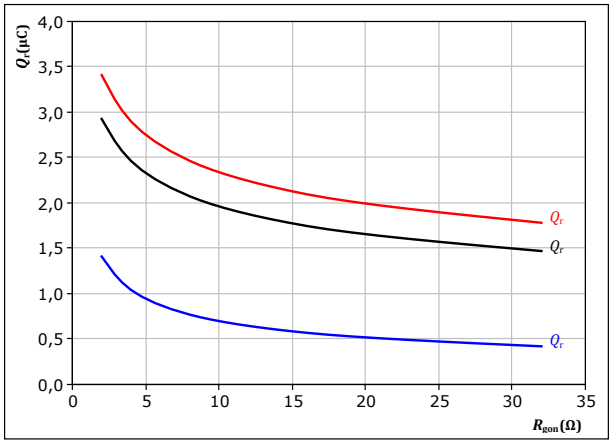


At					
	V_{DS} =	350	V		
	V_{GS} =	-5/18	V	T_j:	25 °C
	R_{gon} =	2	Ω		125 °C
					150 °C

figure 38. **MOSFET**

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

$Q_r = f(R_{gon})$

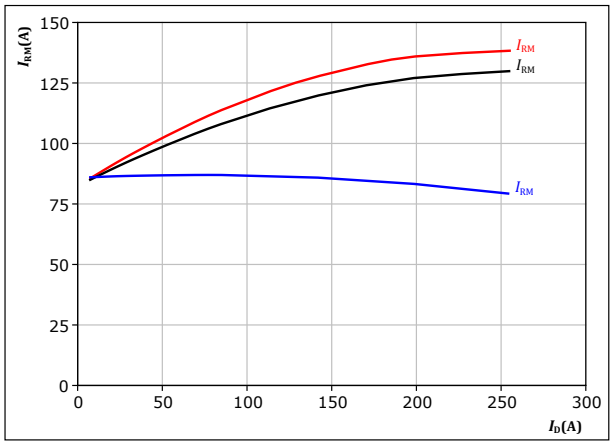


At					
	V_{DS} =	350	V		
	V_{GS} =	-5/18	V	T_j:	25 °C
	I_D =	140	A		125 °C
					150 °C

figure 39. **MOSFET**

Typical peak reverse recovery current as a function of drain current

$I_{RM} = f(I_D)$

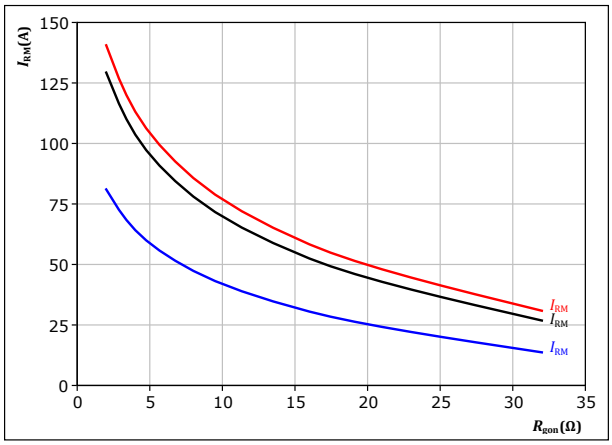


At					
	V_{DS} =	350	V		
	V_{GS} =	-5/18	V	T_j:	25 °C
	R_{gon} =	2	Ω		125 °C
					150 °C

figure 40. **MOSFET**

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

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



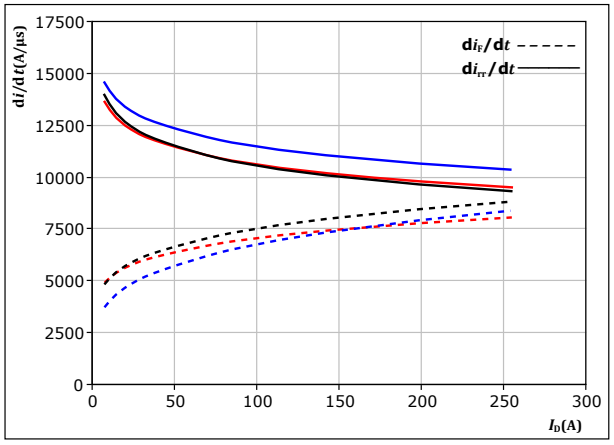
At					
	V_{DS} =	350	V		
	V_{GS} =	-5/18	V	T_j:	25 °C
	I_D =	140	A		125 °C
					150 °C

Boost Switching Characteristics

figure 41. **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)

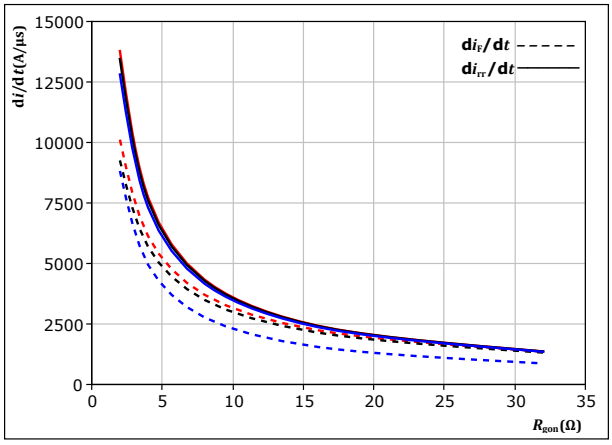


At	V_{DS} =	350	V		
	V_{GS} =	-5/18	V	T_j:	25 °C
	R_{gon} =	2	Ω		125 °C
					150 °C

figure 42. **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})

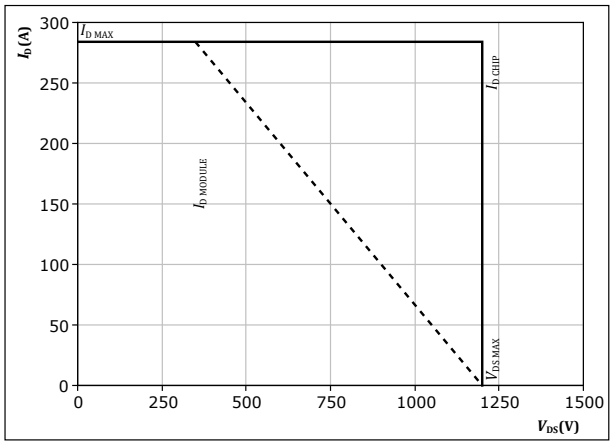


At	V_{DS} =	350	V		
	V_{GS} =	-5/18	V	T_j:	25 °C
	I_D =	140	A		125 °C
					150 °C

figure 43. **MOSFET**

Reverse bias safe operating area

I_D = f(V_{DS})



At	T_j =	150	°C
	R_{gon} =	2	Ω
	R_{goff} =	2	Ω

Switching Definitions

figure 44. MOSFET

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

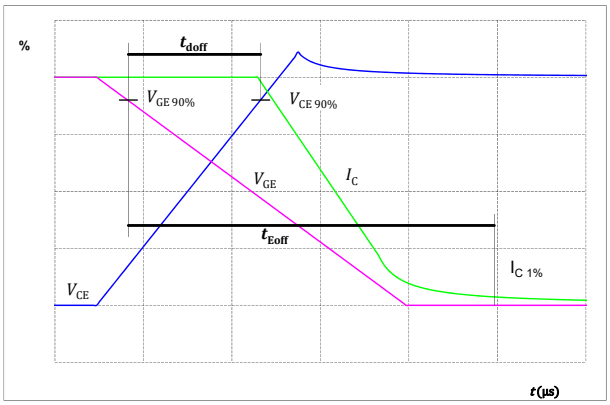


figure 45. MOSFET

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

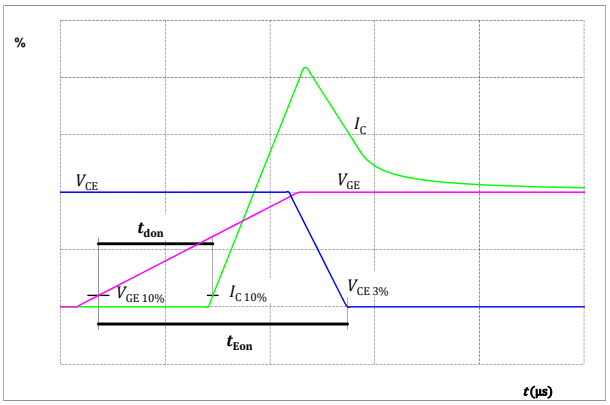


figure 46. MOSFET

Turn-off Switching Waveforms & definition of t_f

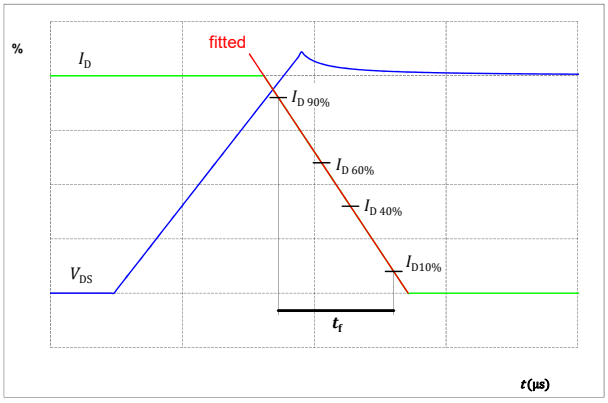
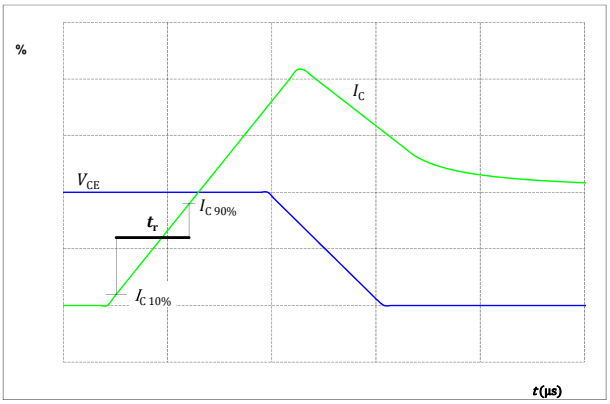


figure 47. MOSFET

Turn-on Switching Waveforms & definition of t_r



Switching Definitions

figure 48. **FWD**

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

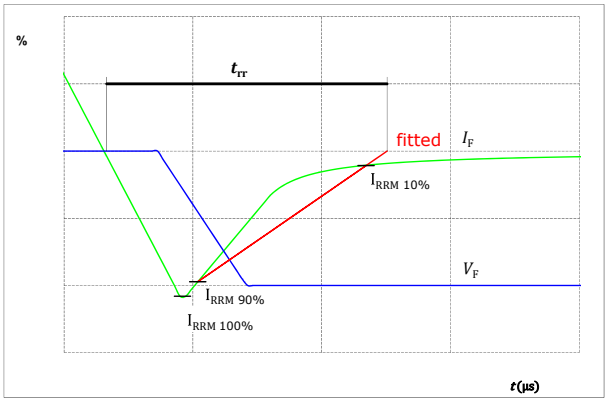


figure 49. **FWD**

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

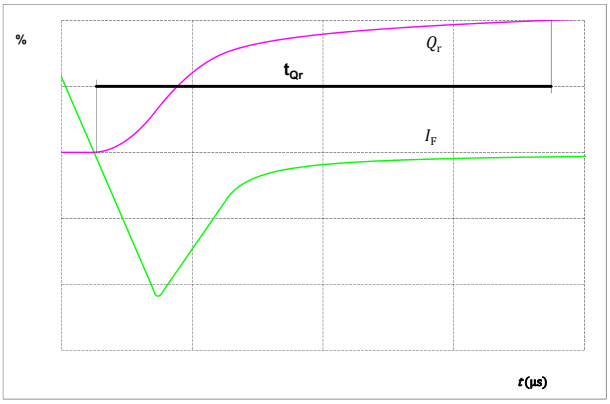
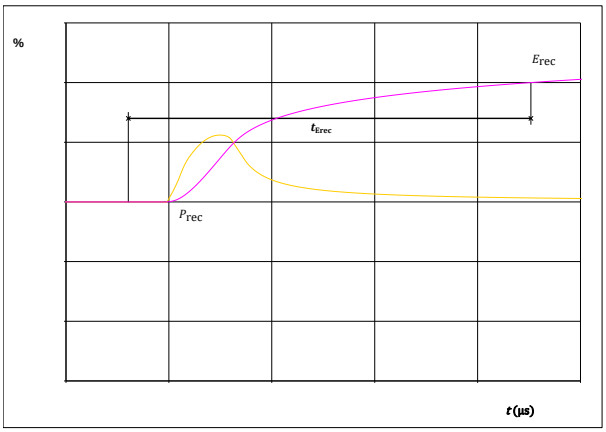


figure 50. **FWD**

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



Ordering Code	
Version	**Ordering Code**
Without thermal paste	10-EY12NMA009MS-LS28F78T
With thermal paste (5,2 W/mK, PTM6000HV)	10-EY12NMA009MS-LS28F78T-/7/

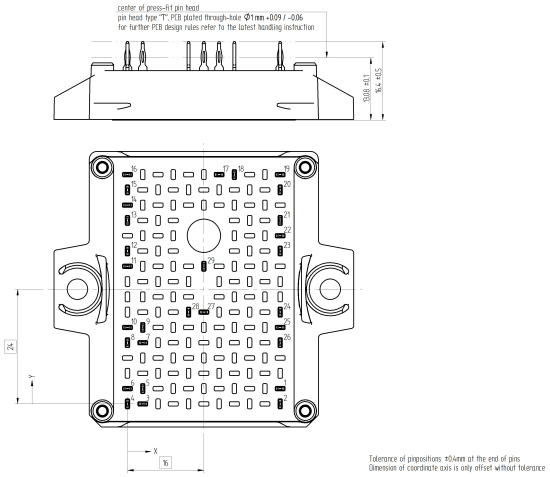
Marking

	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		

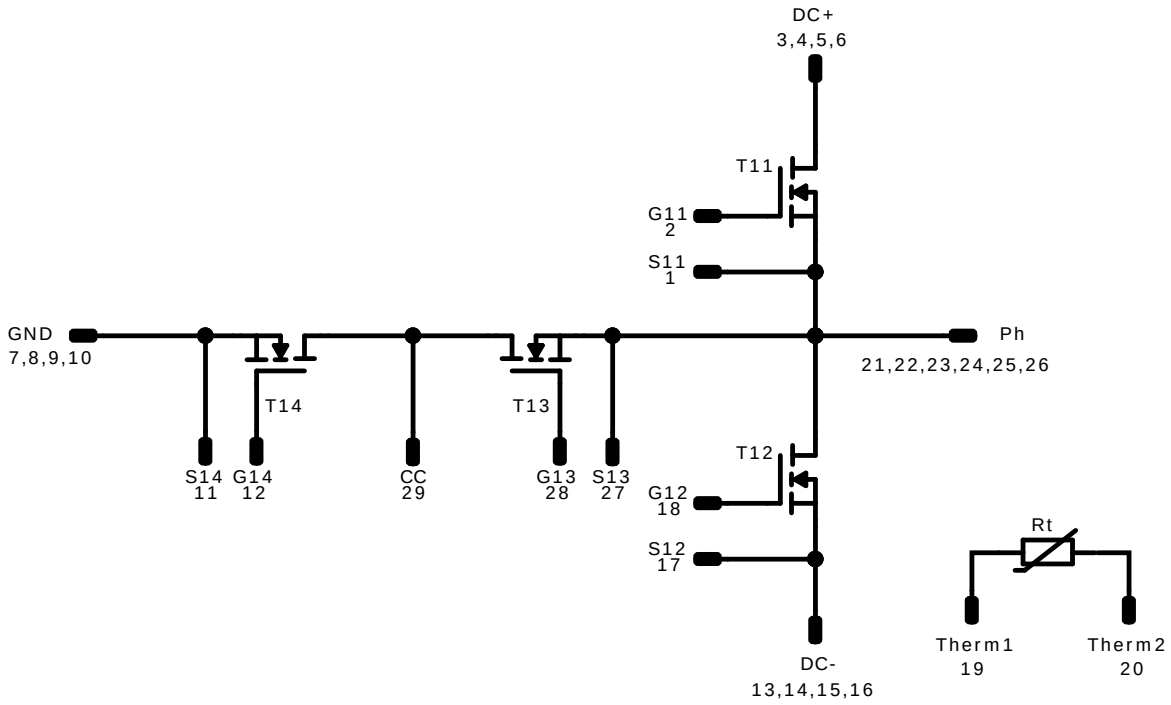
Outline

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	8,5 mΩ	Buck Switch	
T13, T14	MOSFET	1200 V	8,5 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 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-EY12NMA009MS-LS28F78T-D1-14	27 Mar. 2026	Initial Release	