10-EZ07L3A060ME01-PM32L11T
datasheet

Vincotech

***flow*3xNPFC E1**	**650 V / 60 mΩ**

Topology features

- 3xNeutral Boost PFC
- On-board Capacitors
- 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_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

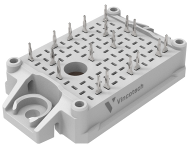
Target applications

- Embedded Drives
- Heat Pumps
- HVAC
- Industrial Drives

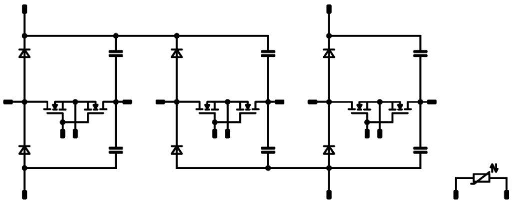
Types

- 10-EZ07L3A060ME01-PM32L11T

flow E1 12 mm housing



Schematic



Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions		Value	Unit
Boost Switch					
Drain-source voltage	V_{DSS}			650	V
Drain current (DC current)	I_D	$T_j = T_{jmax}$	T_s = 80 °C	24	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}		99	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	47	W
Gate-source voltage	V_{GSS}	static		-4 / 15	V
		dynamic		-8 / 19	V
Maximum Junction Temperature	T_{jmax}			175	°C
Boost Diode					
Peak repetitive reverse voltage	V_{RRM}			1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$	T_s = 80 °C	25	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}		40	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	T_j = 25 °C	160	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	T_s = 80 °C	54	W
Maximum junction temperature	T_{jmax}			175	°C
Capacitor (PFC)					
Maximum DC voltage	V_{MAX}			630	V
Operation Temperature	T_{op}			-55 … 150	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
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			9,1	mm
Comparative Tracking Index	CTI		≥ 600	

*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]	Values Min	Typ	Max	Unit
Boost Switch										
Static										
Drain-source on-state resistance	$r_{DS(on)}$		15		13,2	25 125 150	42	68,6 78,3 82,1	79(1)	mΩ
Gate-source threshold voltage	$V_{GS(th)}$				0,005	25	1,8	2,6	3,6	V
Gate to Source Leakage Current	I_{GSS}		15	0		25		10	100	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	650		25		1	50	µA
Internal gate resistance	r_g							3		Ω
Gate charge	Q_g		-4/15	400	13,2	25		46		nC
Short-circuit input capacitance	C_{iss}							1000		
Short-circuit output capacitance	C_{oss}	f = 1 Mhz	0	600	0	25		80		pF
Reverse transfer capacitance	C_{rss}							9		
Diode forward voltage	V_{SD}		0		6,6	25		5,1		V
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						2,04		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$					25 125 150		17,21 15,71 15,41		ns
Rise time	t_r	R_{gon} = 8 Ω R_{goff} = 8 Ω				25 125 150		12,53 11,36 11,15		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		46,81 52,01 53,44		ns
Fall time	t_f		-4/15	350	16	25 125 150		20,55 20,06 18,39		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,148 µC Q_{rFWD}=0,154 µC Q_{rFWD}=0,154 µC				25 125 150		0,124 0,119 0,119		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		0,018 0,02 0,022		mWs

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 Diode										
Static										
Forward voltage	V_F				20	25 125 150		1,43 1,7 1,81	1,65(1) 2,3(1)	V
Reverse leakage current	I_R	V_r = 1200 V				25		1	100	µA
Thermal										
Thermal resistance junction to sink(2)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,76		K/W
Dynamic										
Peak recovery current	I_{RM}	d*i*/d*t*=1637 A/µs d*i*/d*t*=1739 A/µs d*i*/d*t*=1497 A/µs	-4/15	350	16	25 125 150		11,76 12,71 13,1		A
Reverse recovery time	t_{rr}					25 125 150		20,54 19,22 18,87		ns
Recovered charge	Q_r					25 125 150		0,148 0,154 0,154		µC
Reverse recovered energy	E_{rec}					25 125 150		0,028 0,03 0,03		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		674,85 1160,45 1909,69		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 (PFC)										
Static										
Capacitance	C	DC bias voltage = 0 V				25		33		nF
Tolerance							-5		5	%
Thermistor										
Static										
Rated resistance	R					25		5		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 499 Ω				100	3,2		3,3	%
Power dissipation	P					25		130		mW
Power dissipation constant	d					25		1,3		mW/K
B-value	$B_{(25/50)}$	Tol. ±1 %						3380		K
Vincotech Thermistor Reference									V	

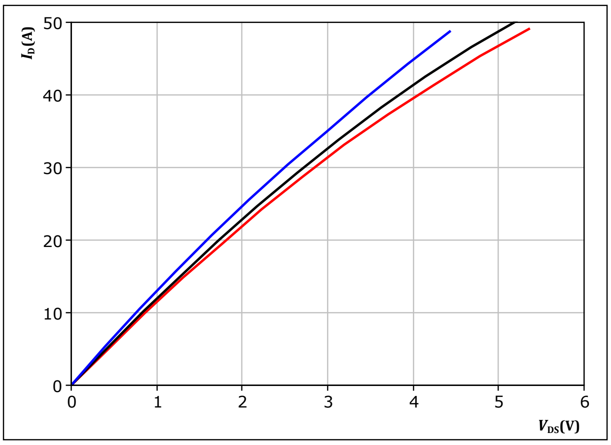
(1) Value at chip level
(2) Only valid with pre-applied Vincotech thermal interface material.

Boost Switch Characteristics

figure 1. MOSFET

Typical output characteristics

I_D = f(V_{DS})



t_p = 250 µs

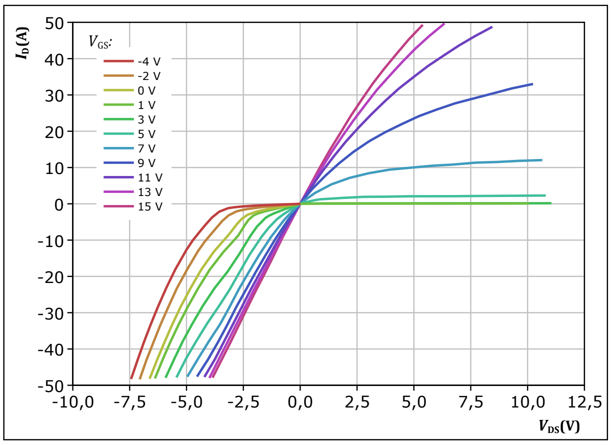
V_{GS} = 15 V

T_j: 25 °C, 125 °C, 150 °C

figure 2. MOSFET

Typical output characteristics

I_D = f(V_{DS})



t_p = 250 µs

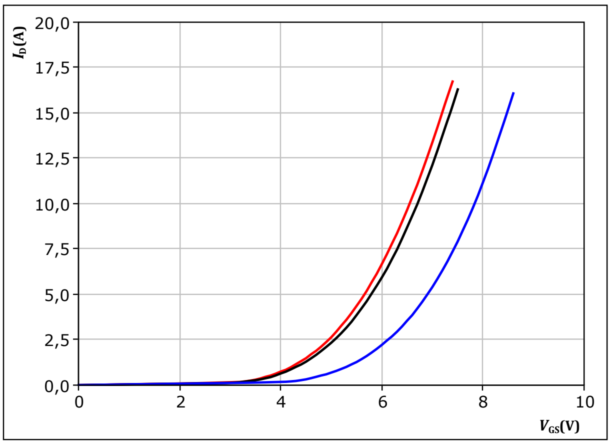
T_j = 150 °C

V_{GS} from -4 V to 15 V in steps of 2 V

figure 3. MOSFET

Typical transfer characteristics

I_D = f(V_{GS})



t_p = 250 µs

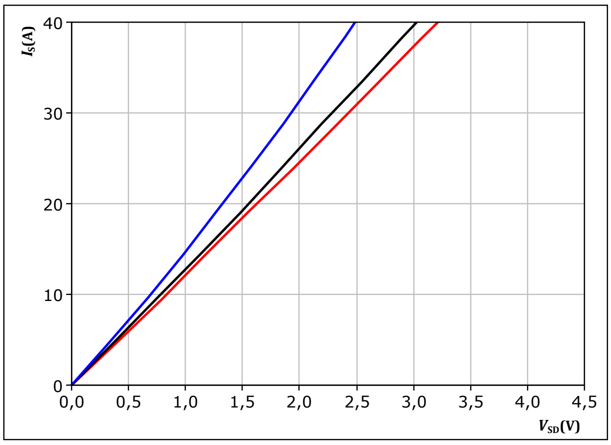
V_{DS} = 10 V

T_j: 25 °C, 125 °C, 150 °C

figure 4. MOSFET

Typical reverse drain current characteristics

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



t_p = 250 µs

V_{GS} = 15 V

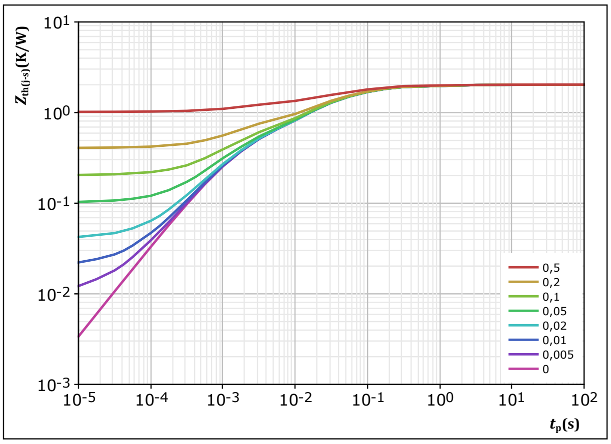
T_j: 25 °C, 125 °C, 150 °C

Boost 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

$R_{th(j-s)}$ = 2,036 K/W

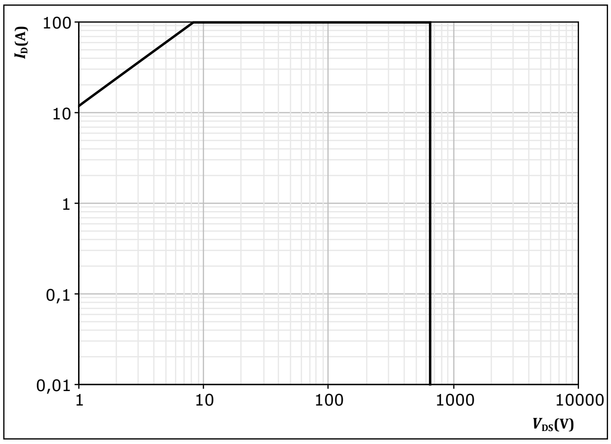
MOSFET thermal model values

R (K/W)	τ (s)
1,74E-02	8,78E+00
1,01E-01	1,50E+00
6,98E-01	9,13E-02
8,28E-01	1,78E-02
3,92E-01	1,37E-03

figure 6. **MOSFET**

Safe operating area

I_D = f(V_{DS})



D = single pulse

T_s = 80 °C

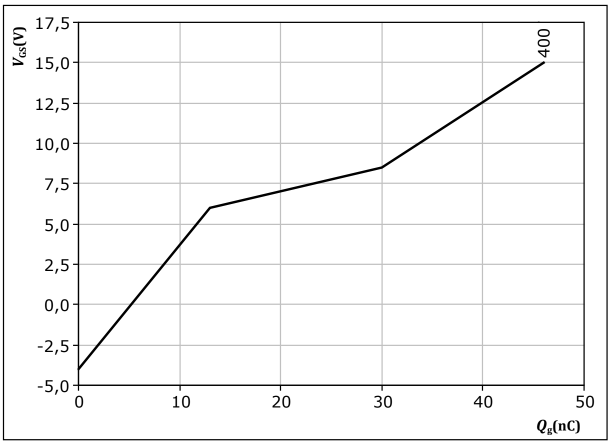
V_{GS} = 15 V

T_j = T_{jmax}

figure 7. **MOSFET**

Gate voltage vs gate charge

V_{GS} = f(Q_g)



I_D = 13.2 A

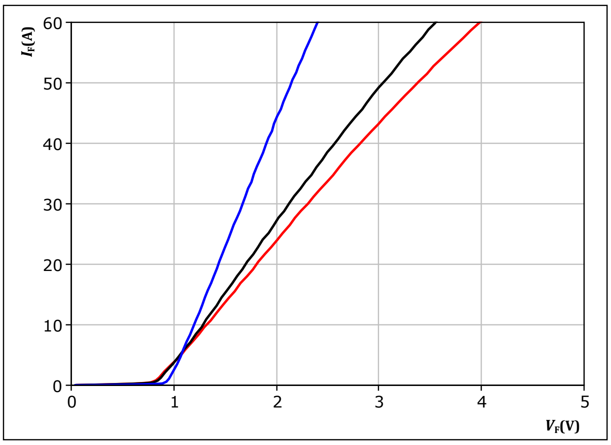
T_j = 25 °C

Boost Diode Characteristics

figure 8. **FWD**

Typical forward characteristics

I_F = f(V_F)



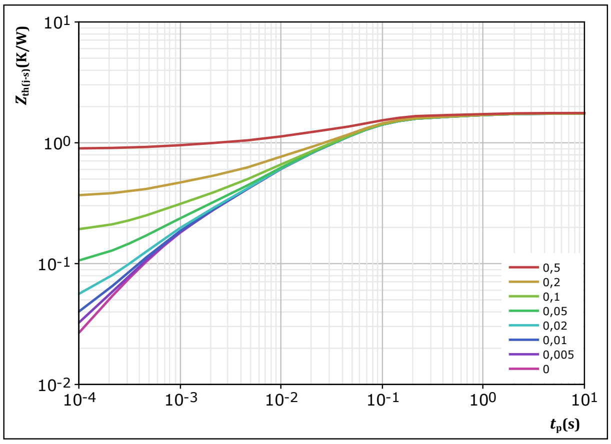
t_p = 250 μs

T_j: 25 °C, 125 °C, 150 °C

figure 9. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,764 K/W

FWD thermal model values

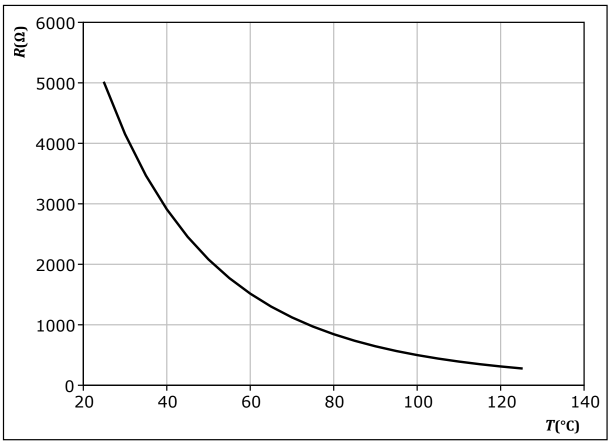
R (K/W)	τ (s)
4,61E-02	4,23E+01
1,88E-01	6,71E-01
1,04E+00	5,37E-02
3,70E-01	6,69E-03
1,42E-01	6,86E-04

Thermistor Characteristics

figure 10. **Thermistor**

Typical NTC characteristic as function of temperature

R_T = f(T)

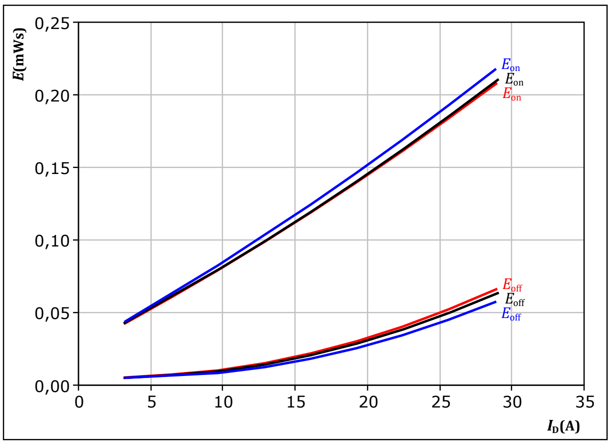


Boost Switching Characteristics

figure 11. MOSFET

Typical switching energy losses as a function of drain current

$E = f(I_D)$



With an inductive load at

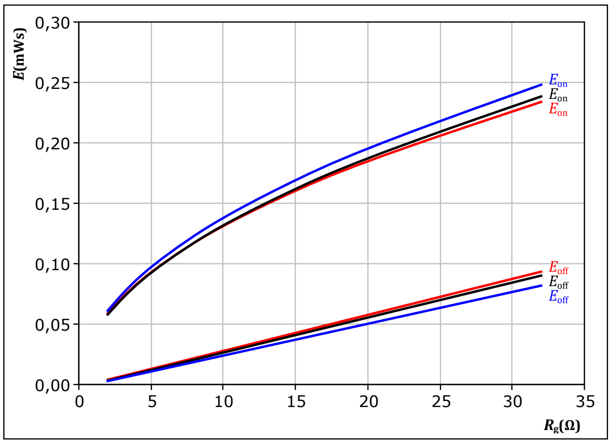
V_{DS} = 350 V
V_{GS} = -4/15 V
R_{gon} = 8 Ω
R_{goff} = 8 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 12. MOSFET

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

$E = f(R_g)$



With an inductive load at

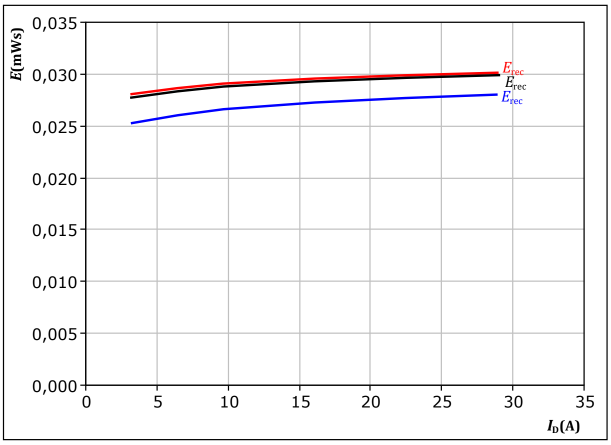
V_{DS} = 350 V
V_{GS} = -4/15 V
I_D = 16 A

T_j: 25 °C, 125 °C, 150 °C

figure 13. FWD

Typical reverse recovered energy loss as a function of drain current

$E_{rec} = f(I_D)$



With an inductive load at

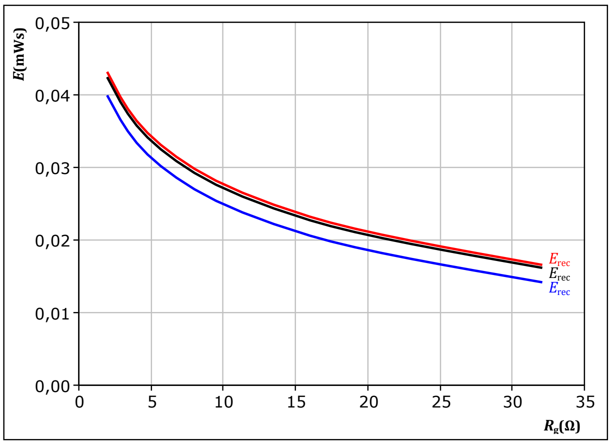
V_{DS} = 350 V
V_{GS} = -4/15 V
R_{gon} = 8 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 14. 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} = 350 V
V_{GS} = -4/15 V
I_D = 16 A

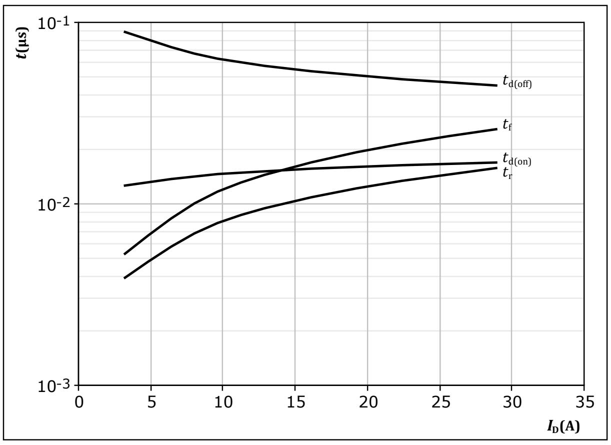
T_j: 25 °C, 125 °C, 150 °C

Boost Switching Characteristics

figure 15. **MOSFET**

Typical switching times as a function of drain current

t = f(I_D)



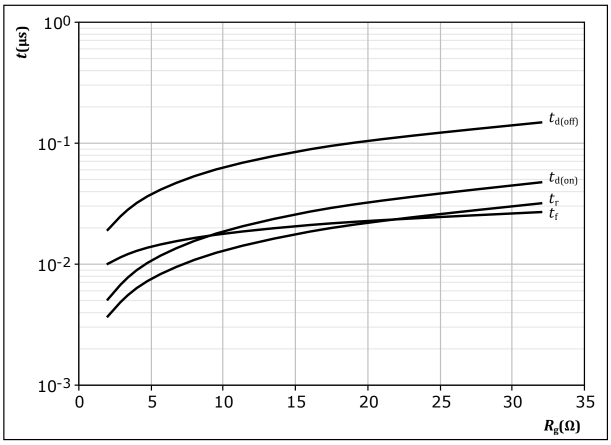
With an inductive load at

T_j =	150	°C
V_{DS} =	350	V
V_{GS} =	-4/15	V
R_{gon} =	8	Ω
R_{goff} =	8	Ω

figure 16. **MOSFET**

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

t = f(R_g)



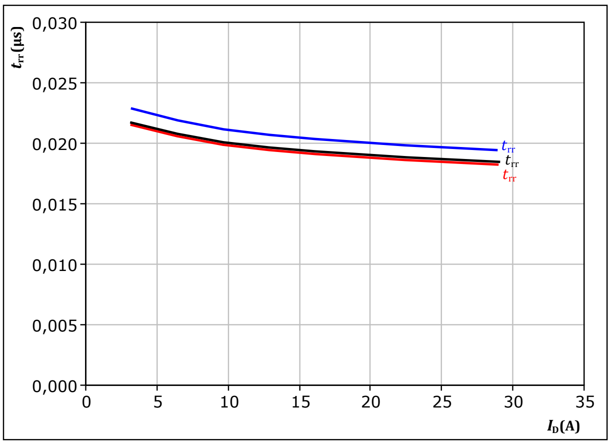
With an inductive load at

T_j =	150	°C
V_{DS} =	350	V
V_{GS} =	-4/15	V
I_D =	16	A

figure 17. **FWD**

Typical reverse recovery time as a function of drain current

t_{rr} = f(I_D)



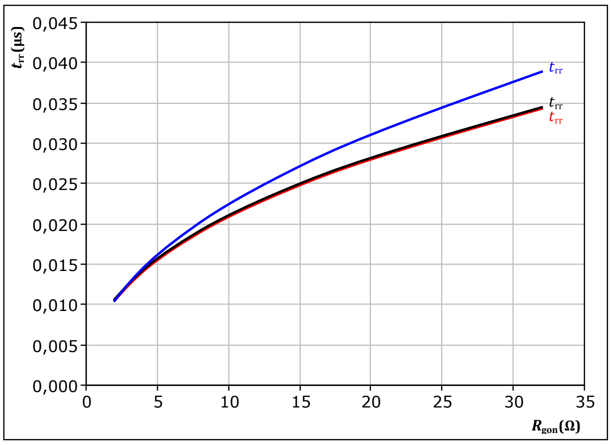
At			
	V_{DS} =	350	V
	V_{GS} =	-4/15	V
	R_{gon} =	8	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 18. **FWD**

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} =	-4/15	V
	I_D =	16	A

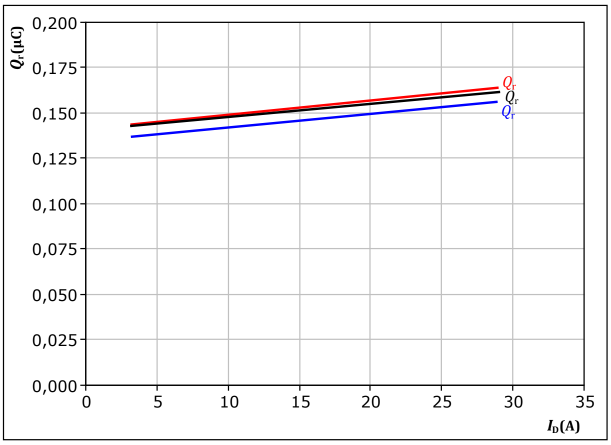
T_j: 25 °C, 125 °C, 150 °C

Boost Switching Characteristics

figure 19. FWD

Typical recovered charge as a function of drain current

Q_r = f(I_D)



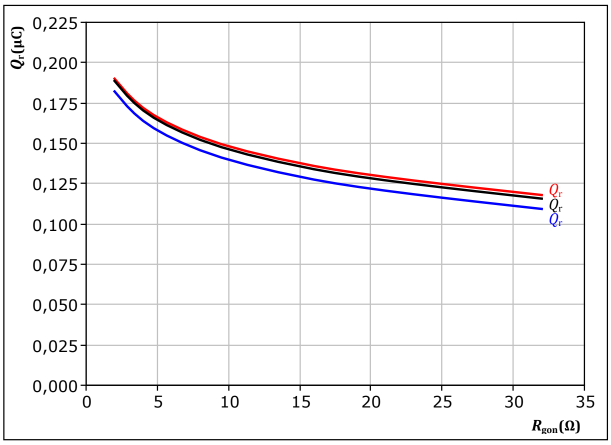
At V_{DS} = 350 V
V_{GS} = -4/15 V
R_{gon} = 8 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 20. FWD

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

Q_r = f(R_{gon})



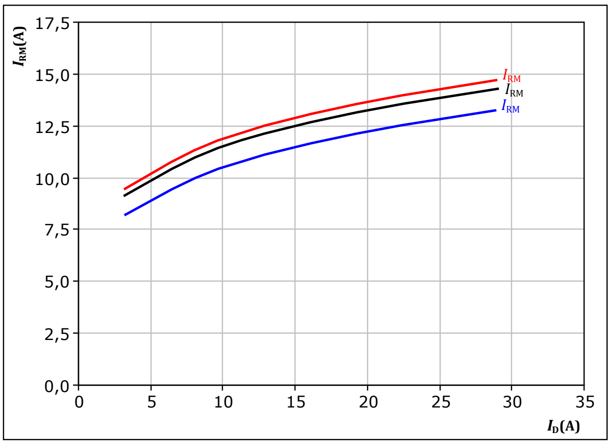
At V_{DS} = 350 V
V_{GS} = -4/15 V
I_D = 16 A

T_j: 25 °C, 125 °C, 150 °C

figure 21. FWD

Typical peak reverse recovery current as a function of drain current

I_{RM} = f(I_D)



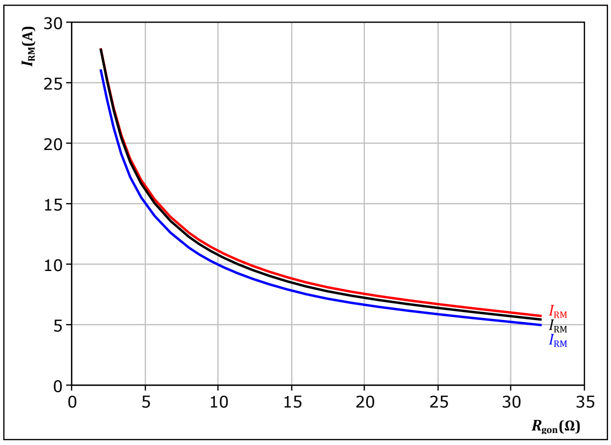
At V_{DS} = 350 V
V_{GS} = -4/15 V
R_{gon} = 8 Ω

T_j: 25 °C, 125 °C, 150 °C

figure 22. FWD

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} = -4/15 V
I_D = 16 A

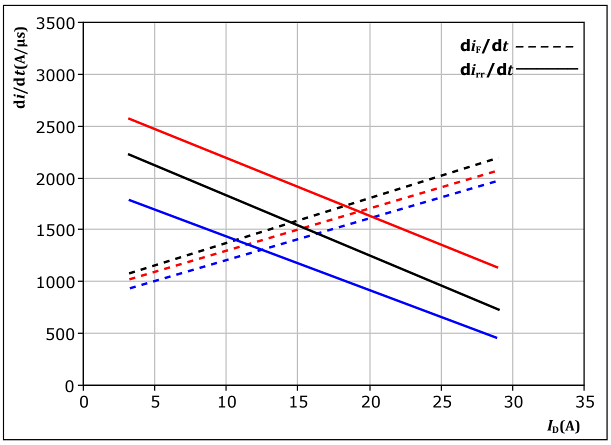
T_j: 25 °C, 125 °C, 150 °C

Boost Switching Characteristics

figure 23. **FWD**

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)

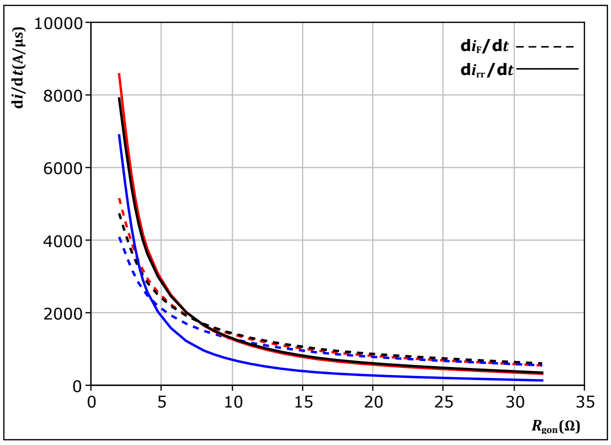


At					
	V_{DS} =	350	V	T_j:	25 °C
	V_{GS} =	-4/15	V		125 °C
	R_{gon} =	8	Ω		150 °C

figure 24. **FWD**

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})

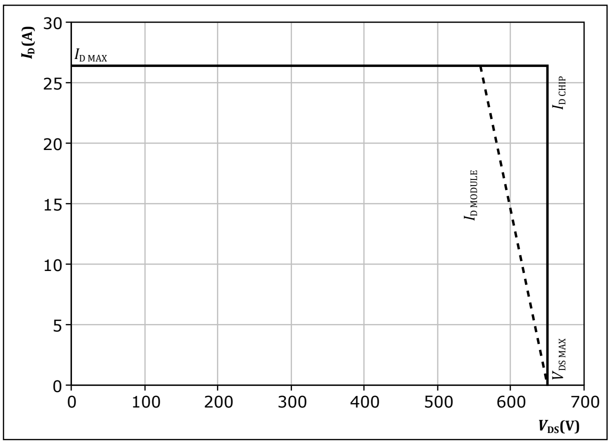


At					
	V_{DS} =	350	V	T_j:	25 °C
	V_{GS} =	-4/15	V		125 °C
	I_D =	16	A		150 °C

figure 25. **MOSFET**

Reverse bias safe operating area

I_D = f(V_{DS})



At			
	T_j =	150	°C
	R_{gon} =	8	Ω
	R_{goff} =	8	Ω

Boost Switching Definitions

figure 26. **MOSFET**

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

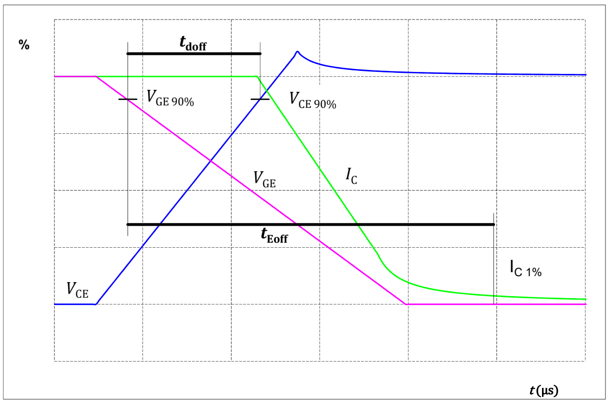


figure 27. **MOSFET**

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

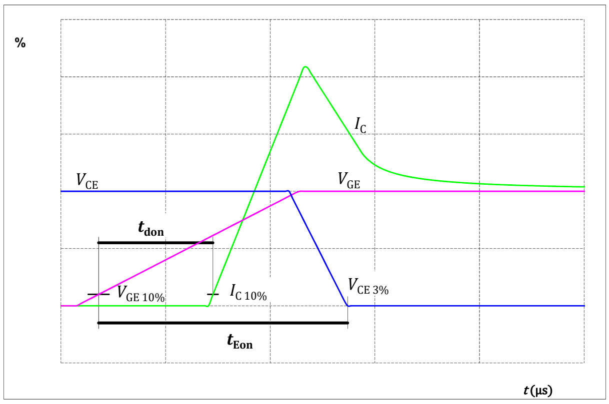


figure 28. **MOSFET**

Turn-off Switching Waveforms & definition of t_f

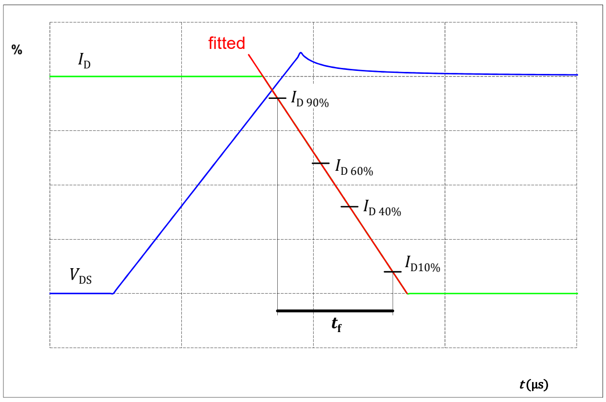
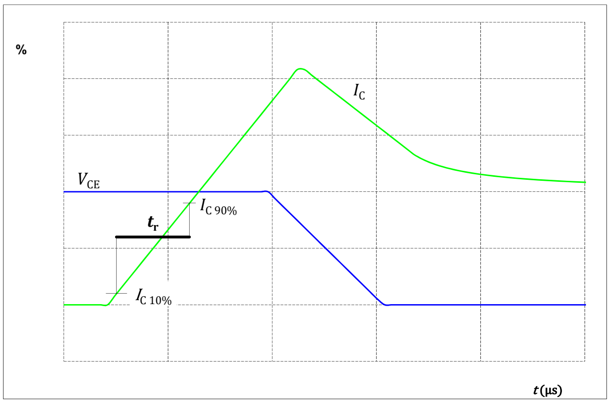


figure 29. **MOSFET**

Turn-on Switching Waveforms & definition of t_r



Boost Switching Definitions

figure 30. **FWD**

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

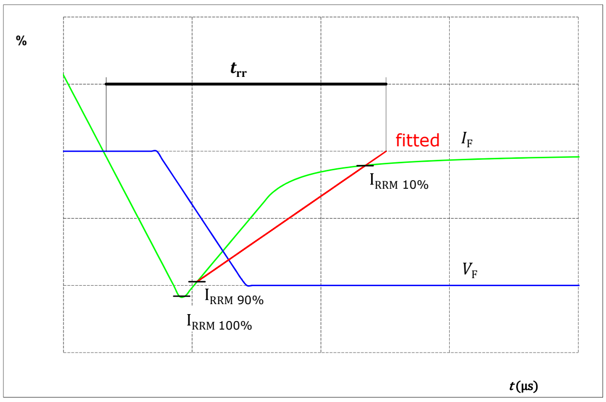


figure 31. **FWD**

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

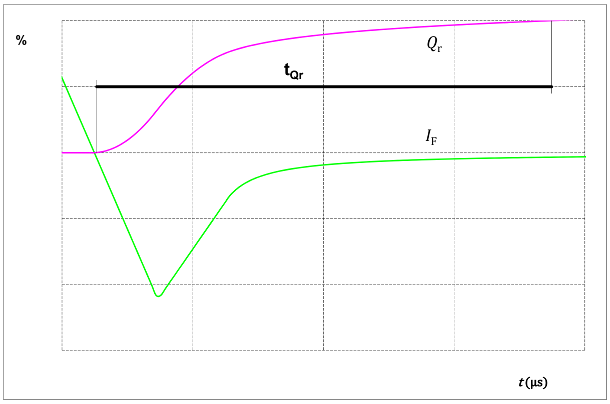
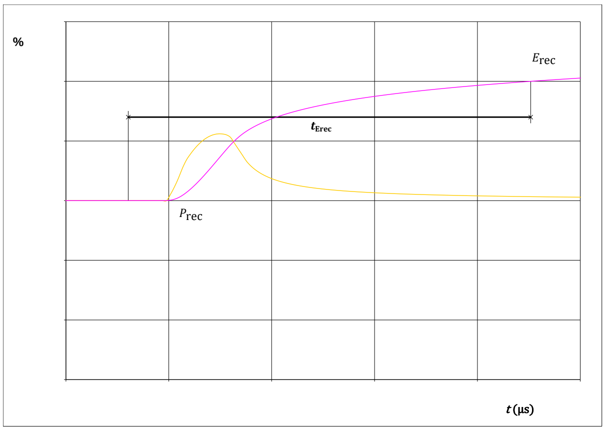


figure 32. **FWD**

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



Ordering Code

Version	Ordering Code
Without thermal paste	10-EZ07L3A060ME01-PM32L11T
With thermal paste (5,2 W/mK, PTM6000HV)	10-EZ07L3A060ME01-PM32L11T-/7/

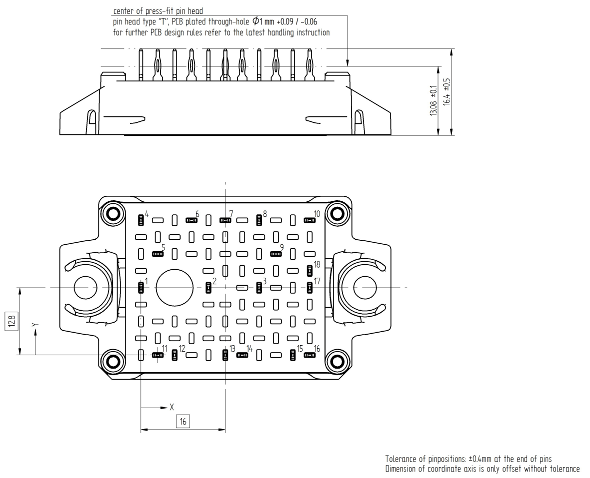
Marking

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

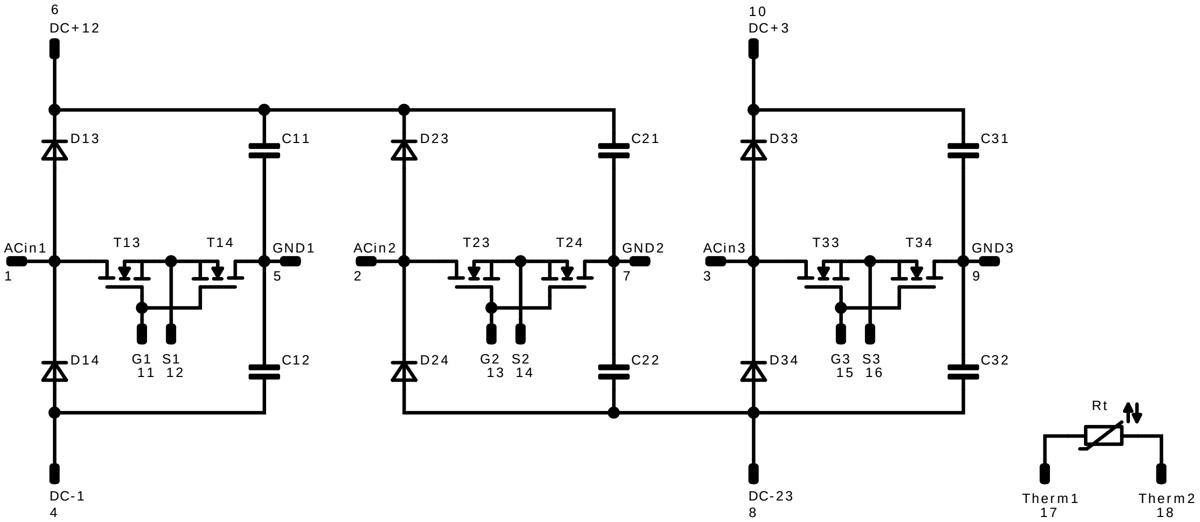
Outline

Pin	X	Y	Function
1	0	12,8	ACIn1
2	12,8	12,8	ACIn2
3	22,4	12,8	ACIn3
4	0	25,6	DC-1
5	3,2	19,2	GND1
6	9,6	25,6	DC+12
7	16	25,6	GND2
8	22,4	25,6	DC-23
9	25,6	19,2	GND3
10	32	25,6	DC+3
11	3,2	0	G1
12	6,4	0	S1
13	16	0	G2
14	19,2	0	S2
15	28,8	0	G3
16	32	0	S3
17	32	12,8	Therm1
18	32	16	Therm2

Pin table [mm]



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
C11, C12, C13, C14, C15, C16	Capacitor	630 V		Capacitor (PFC)	
T13, T14, T23, T24, T33, T34	MOSFET	650 V	60 mΩ	Boost Switch	
D13, D14, D23, D24, D33, D34	FWD	1200 V	20 A	Boost Diode	
Rt	Thermistor			Thermistor	

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

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

Package data
Package data for *flow* E1 packages see vincotech.com website.

Vincotech thermistor reference
See Vincotech thermistor reference table at vincotech.com website.

UL recognition and file number
This device is UL 1557 recognized under E192116 up to a junction temperature under switching condition $T_{j,op}$=175°C and up to 3500VAC/1min isolation voltage. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
10-EZ07L3A060ME01-PM32L11T-D1-14	13 Aug. 2025	Initial Release	