Vincotech

10-EZ126TB015M7-LS16F13T
datasheet

_flow_PACK E1 **1200 V / 15 A**

Topology features

- Inverter
- Kelvin Emitter for improved switching performance
- Tandem inverter diode
- Temperature sensor

Component features

- Easy paralleling
- Low turn-off losses
- Low collector emitter saturation voltage
- Positive temperature coefficient
- Short tail current
- Switching optimized for EMC

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

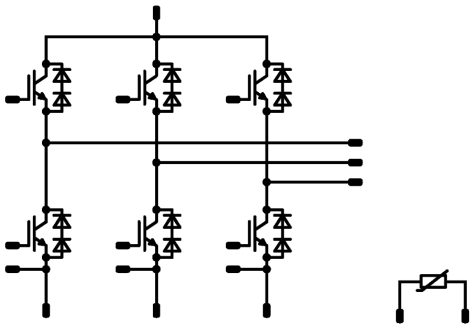
- General Purpose Drives
- Industrial Drives
- Servo Drives

Types

- 10-EZ126TB015M7-LS16F13T

flow E1 12 mm housing

Schematic



Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Inverter Switch				
Collector-emitter voltage	V_{CES}		1200	V
Collector current (DC current)	I_C	T_j = T_{jmax} T_s <= 80 °C	30 (1)	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	30	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	64	W
Gate-emitter voltage	V_{GES}		±20	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 800 V T_j = 150 °C	9,5	µs
Maximum junction temperature	T_{jmax}		175	°C
(1) limited by I_{CRM}				
Inverter Diode				
Peak repetitive reverse voltage	V_{RRM}		1300	V
Forward current (DC current)	I_F	T_j = T_{jmax} T_s = 80 °C	21	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	45	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	60	W
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			8,74	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	
Inverter Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$			10	0,0015	25	5,4	6	6,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		15	25 125 150		1,7 1,95 2,01	2,1(2)	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			60	µA
Gate-emitter leakage current	I_{GES}		20	0		25			200	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}		0	10		25		2900		pF
Output capacitance	C_{oes}							120		pF
Reverse transfer capacitance	C_{res}							34		pF
Gate charge	Q_g	V_{CC} = 600 V	0/15		15	25		110		nC
Thermal										
Thermal resistance junction to sink(3)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,48		K/W
Dynamic										
Turn-on delay time	$t_{d(on)}$	R_{gon} = 2 Ω R_{goff} = 2 Ω	±15	600	15	25 125 150		26,56 27,1 27,18		ns
Rise time	t_r					25 125 150		2,26 2,88 3,08		ns
Turn-off delay time	$t_{d(off)}$					25 125 150		127,36 148,01 151,45		ns
Fall time	t_f					25 125 150		95,85 131,4 142,61		ns
Turn-on energy (per pulse)	E_{on}	Q_{rFWD}=0,308 µC Q_{rFWD}=0,926 µC Q_{rFWD}=1,07 µC				25 125 150		0,126 0,251 0,293		mWs
Turn-off energy (per pulse)	E_{off}					25 125 150		1,01 1,37 1,49		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	
Inverter Diode										
Static										
Forward voltage	V_F				15	25 125 150		2,91 2,7 2,63	3,84(2)	V
Reverse leakage current	I_R	V_r = 1300 V				25			0,94	µA
Thermal										
Thermal resistance junction to sink(3)	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,58		K/W
Dynamic										
Peak recovery current	I_{RM}	di/dt=8060 A/µs di/dt=6689 A/µs di/dt=6167 A/µs	±15	600	15	25 125 150		43,33 42 43,39		A
Reverse recovery time	t_{rr}					25 125 150		13,3 77,31 90,24		ns
Recovered charge	Q_r					25 125 150		0,308 0,926 1,07		µC
Reverse recovered energy	E_{rec}					25 125 150		0,123 0,439 0,509		mWs
Peak rate of fall of recovery current	$(di_{rf}/dt)_{max}$					25 125 150		7283,49 5002 4398,88		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} = 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	

(2) Value at chip level

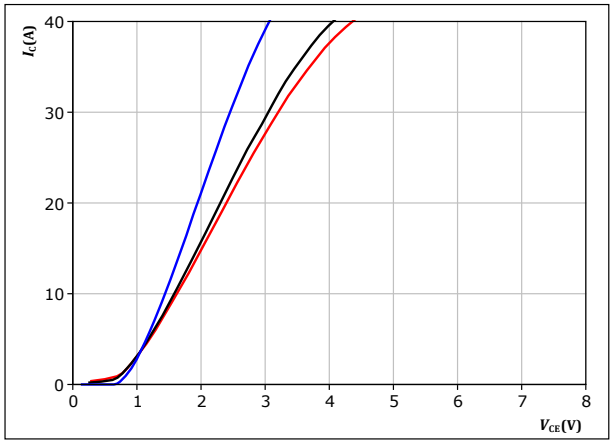
(3) Only valid with pre-applied Vincotech thermal interface material.

Inverter Switch Characteristics

figure 1. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$

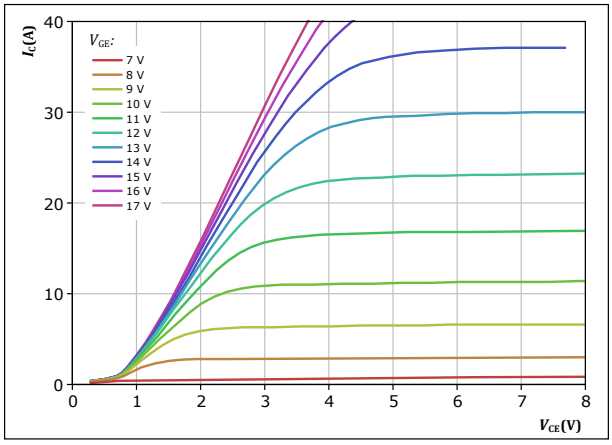


t_p =	250	µs		
V_{GE} =	15	V	T_j:	25 °C
				125 °C
				150 °C

figure 2. **IGBT**

Typical output characteristics

$I_C = f(V_{CE})$



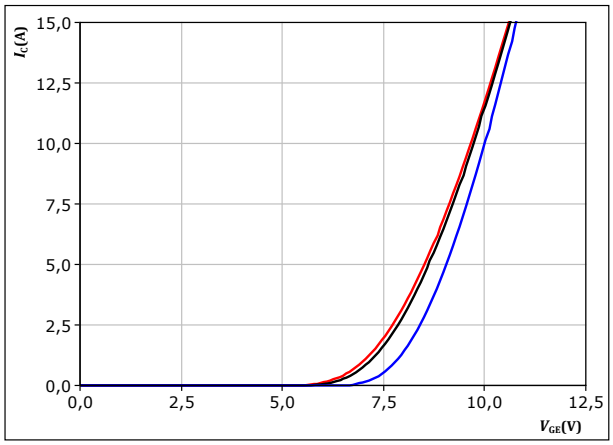
t_p =	250	µs
T_j =	150	°C

V_{GE} from 7 V to 17 V in steps of 1 V

figure 3. **IGBT**

Typical transfer characteristics

$I_C = f(V_{GE})$

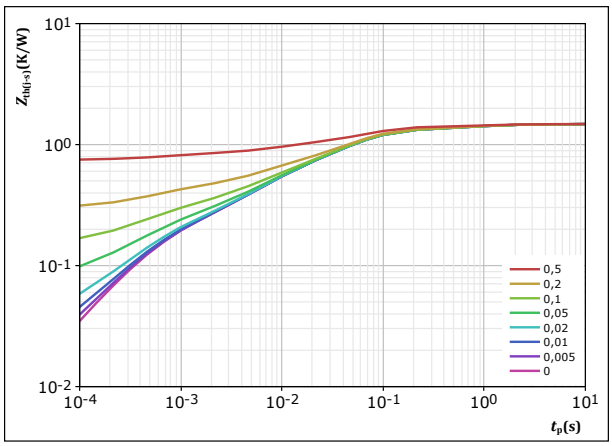


t_p =	250	µs		
V_{CE} =	10	V	T_j:	25 °C
				125 °C
				150 °C

figure 4. **IGBT**

Transient thermal impedance as a function of pulse width

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



D =	t_p / T	
$R_{th(j-s)}$ =	1,479	K/W

IGBT thermal model values

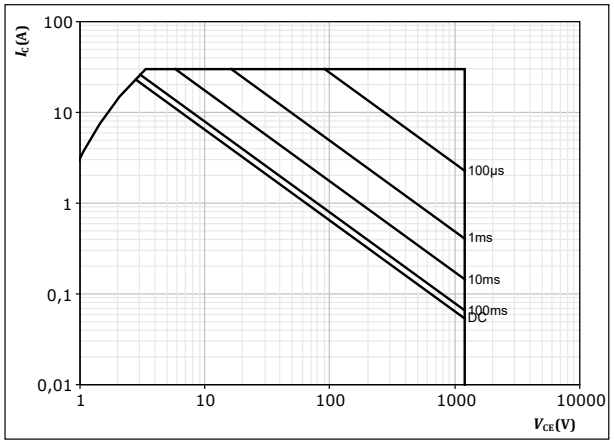
R (K/W)	τ (s)
2,71E-02	7,17E+00
1,70E-01	6,77E-01
8,42E-01	4,88E-02
2,91E-01	6,15E-03
1,54E-01	4,91E-04

Inverter Switch Characteristics

figure 5. **IGBT**

Safe operating area

$I_C = f(V_{CE})$

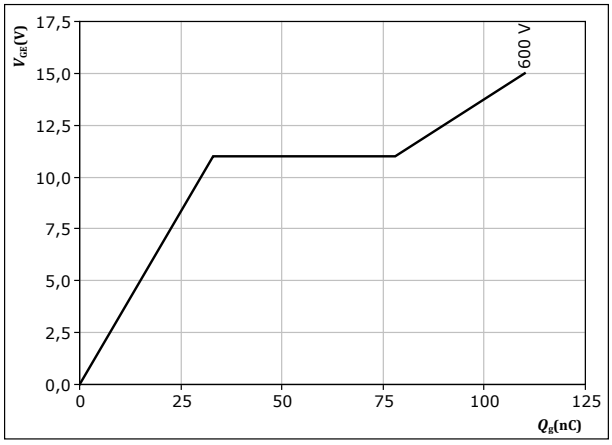


D =	single pulse	
T_s =	80	°C
V_{GE} =	15	V
T_j =	T_{jmax}	

figure 6. **IGBT**

Gate voltage vs gate charge

$V_{GE} = f(Q_g)$



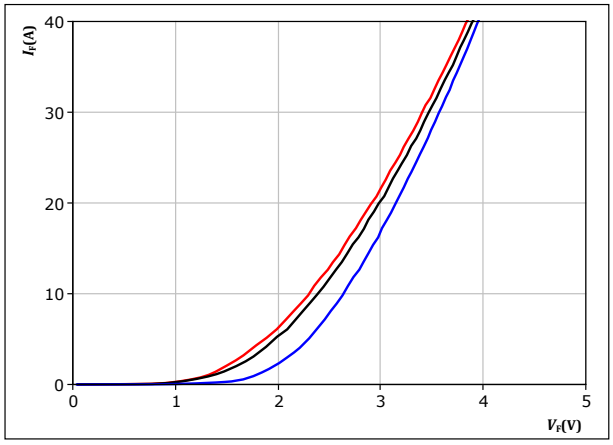
I_C =	15	A
T_j =	25	°C

Inverter Diode Characteristics

figure 7. **FWD**

Typical forward characteristics

$I_F = f(V_F)$



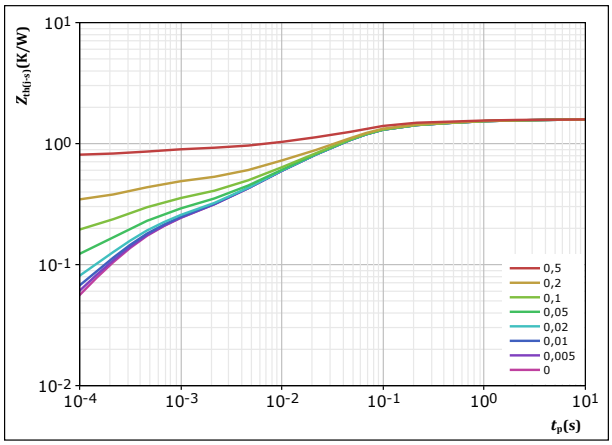
t_p = 250 µs

T_j: 25 °C, 125 °C, 150 °C

figure 8. **FWD**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 1,584 K/W

FWD thermal model values

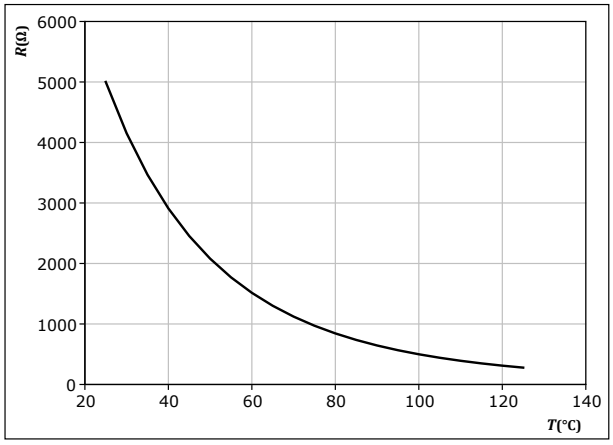
R (K/W)	τ (s)
4,99E-02	4,51E+00
1,90E-01	4,07E-01
8,87E-01	4,36E-02
2,71E-01	6,11E-03
1,92E-01	3,34E-04

Thermistor Characteristics

figure 9. **Thermistor**

Typical NTC characteristic as function of temperature

$R_T = f(T)$

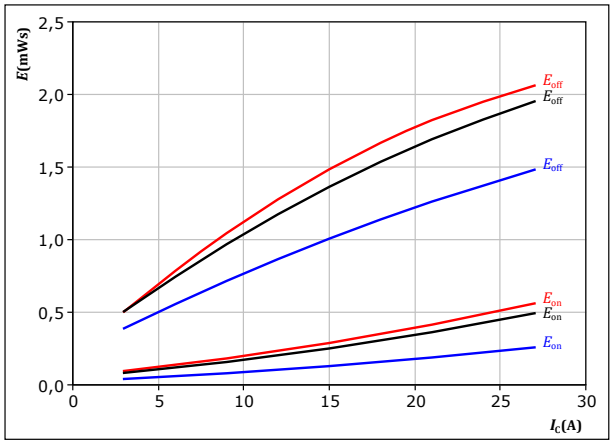


Inverter Switching Characteristics

figure 10. **IGBT**

Typical switching energy losses as a function of collector current

$E = f(I_C)$



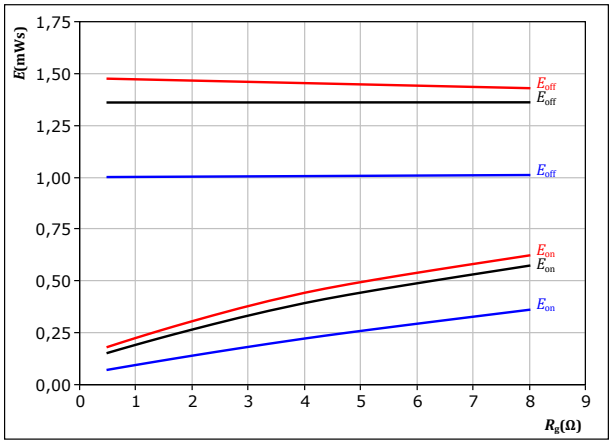
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	2	Ω		150 °C
R_{goff} =	2	Ω		

figure 11. **IGBT**

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

$E = f(R_g)$



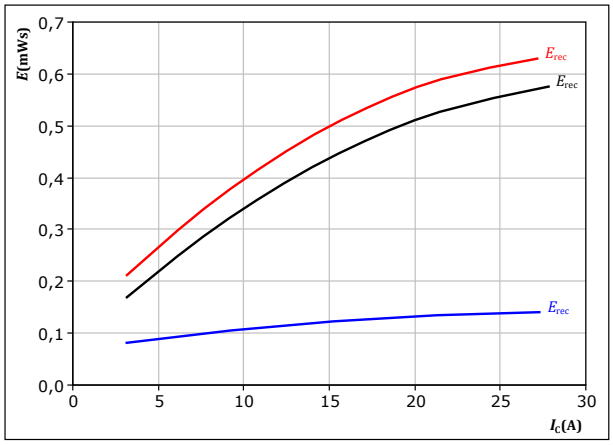
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	15	A		150 °C

figure 12. **FWD**

Typical reverse recovered energy loss as a function of collector current

$E_{rec} = f(I_C)$



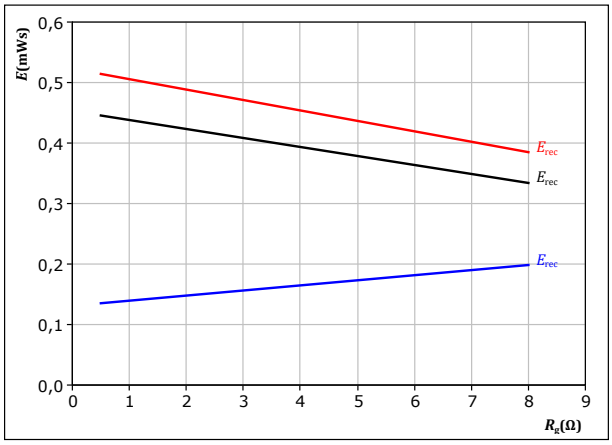
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 13. **FWD**

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

$E_{rec} = f(R_g)$



With an inductive load at

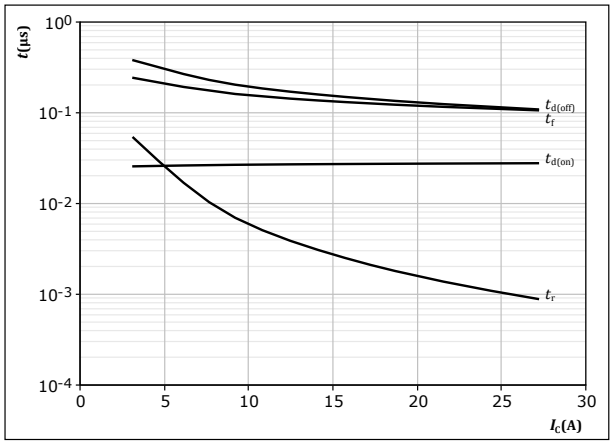
V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	15	A		150 °C

Inverter Switching Characteristics

figure 14. **IGBT**

Typical switching times as a function of collector current

$t = f(I_C)$



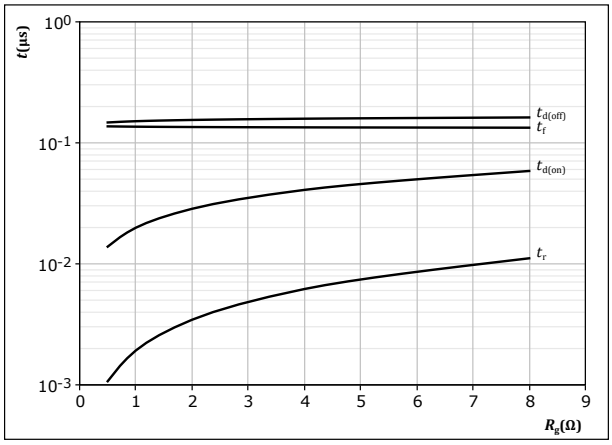
With an inductive load at

T_j =	150	°C
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	2	Ω
R_{goff} =	2	Ω

figure 15. **IGBT**

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

$t = f(R_g)$



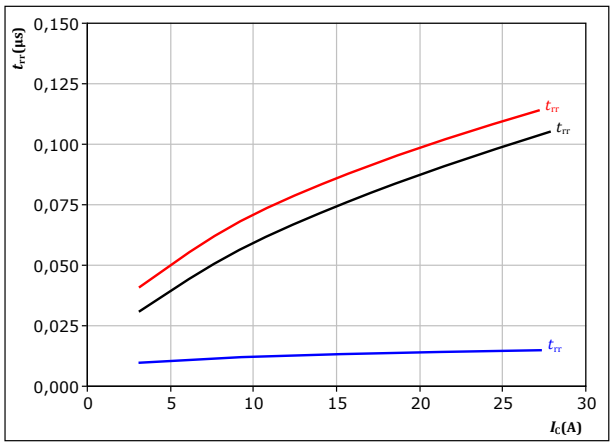
With an inductive load at

T_j =	150	°C
V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	15	A

figure 16. **FWD**

Typical reverse recovery time as a function of collector current

$t_{rr} = f(I_C)$



With an inductive load at

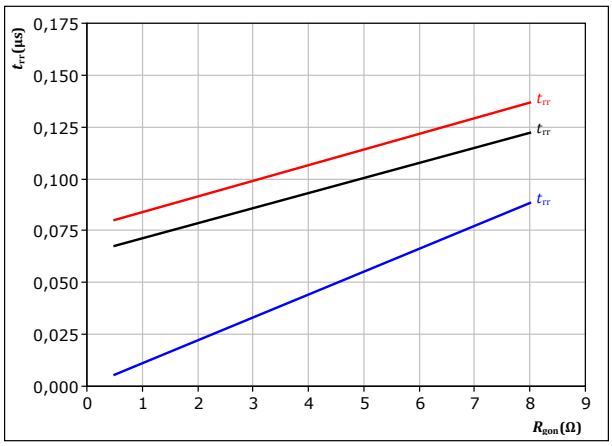
V_{CE} =	600	V
V_{GE} =	±15	V
R_{gon} =	2	Ω

T_j: 25 °C, 125 °C, 150 °C

figure 17. **FWD**

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

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



With an inductive load at

V_{CE} =	600	V
V_{GE} =	±15	V
I_C =	15	A

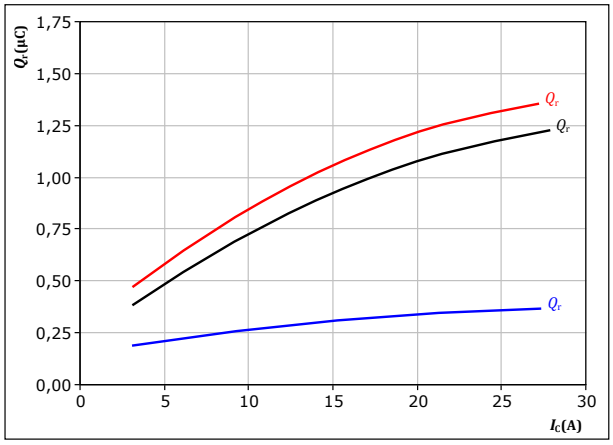
T_j: 25 °C, 125 °C, 150 °C

Inverter Switching Characteristics

figure 18. **FWD**

Typical recovered charge as a function of collector current

$Q_r = f(I_C)$



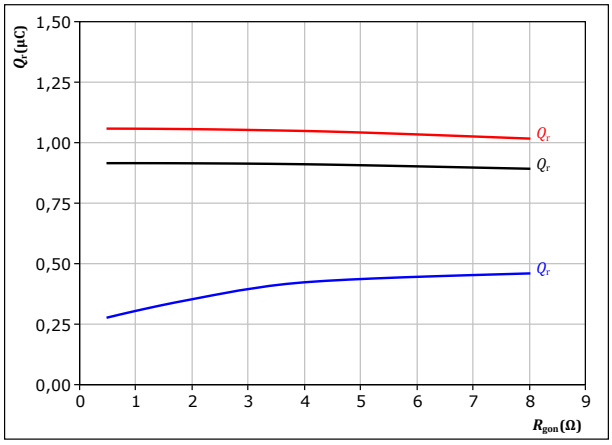
With an inductive load at

V_{CE} =	600	V	T_j: 25 °C
V_{GE} =	±15	V	125 °C
R_{gon} =	2	Ω	150 °C

figure 19. **FWD**

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

$Q_r = f(R_{gon})$



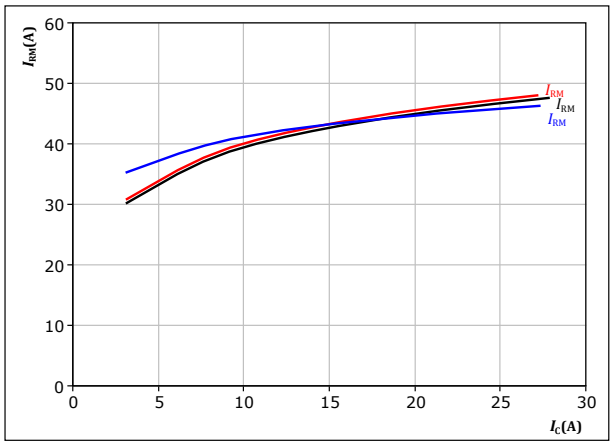
With an inductive load at

V_{CE} =	600	V	T_j: 25 °C
V_{GE} =	±15	V	125 °C
I_C =	15	A	150 °C

figure 20. **FWD**

Typical peak reverse recovery current as a function of collector current

$I_{RM} = f(I_C)$



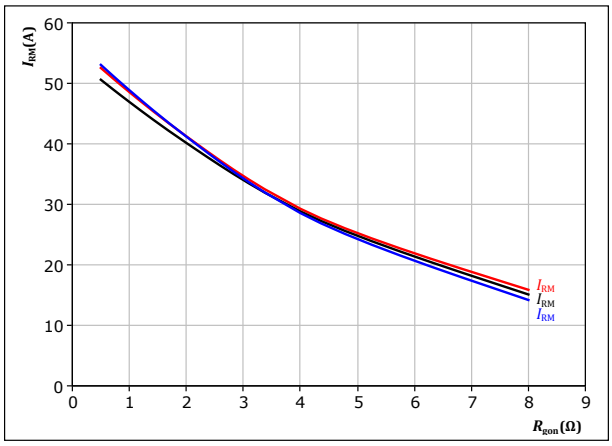
With an inductive load at

V_{CE} =	600	V	T_j: 25 °C
V_{GE} =	±15	V	125 °C
R_{gon} =	2	Ω	150 °C

figure 21. **FWD**

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

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



With an inductive load at

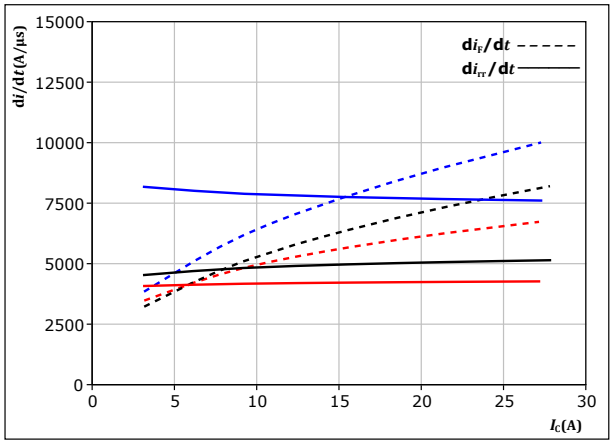
V_{CE} =	600	V	T_j: 25 °C
V_{GE} =	±15	V	125 °C
I_C =	15	A	150 °C

Inverter Switching Characteristics

figure 22. **FWD**

Typical rate of fall of forward and reverse recovery current as a function of collector current

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



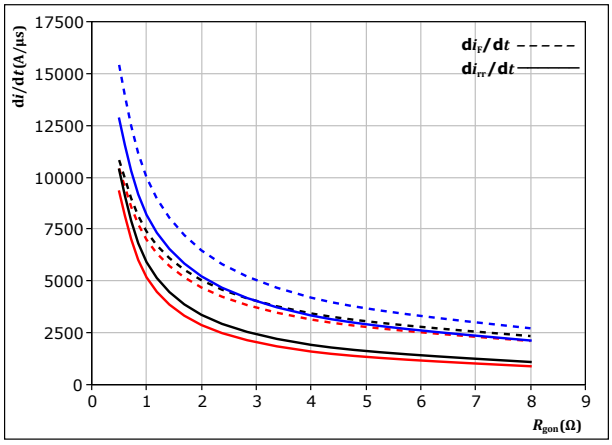
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
R_{gon} =	2	Ω		150 °C

figure 23. **FWD**

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

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



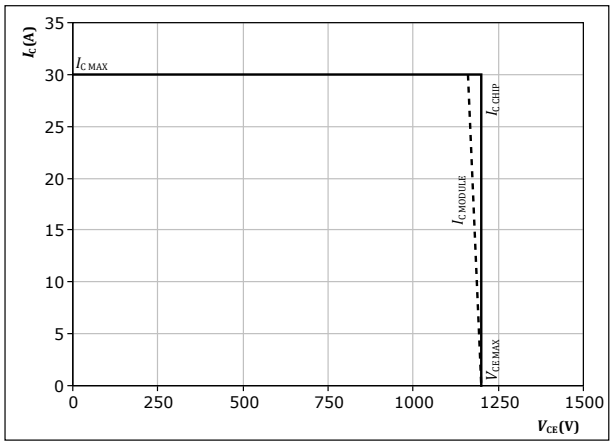
With an inductive load at

V_{CE} =	600	V	T_j:	25 °C
V_{GE} =	±15	V		125 °C
I_C =	15	A		150 °C

figure 24. **IGBT**

Reverse bias safe operating area

I_C = f(V_{CE})



At

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

Inverter Switching Definitions

figure 25. **IGBT**

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

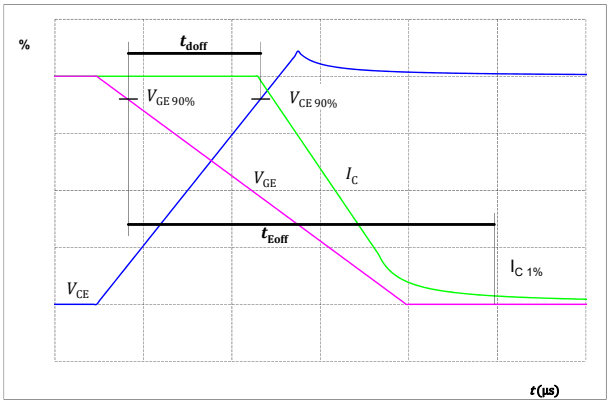


figure 26. **IGBT**

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

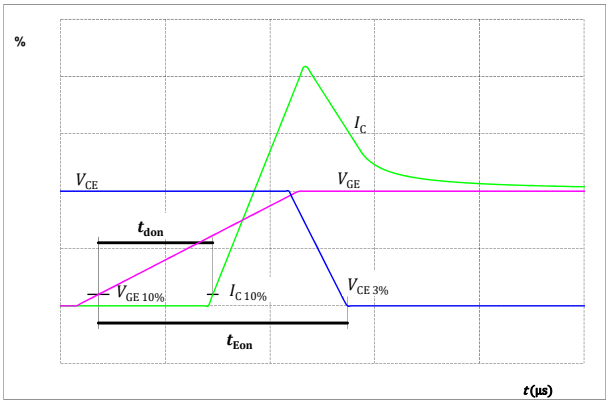


figure 27. **IGBT**

Turn-off Switching Waveforms & definition of t_f

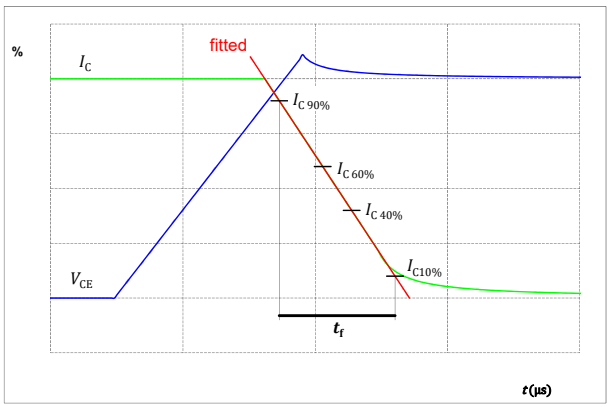
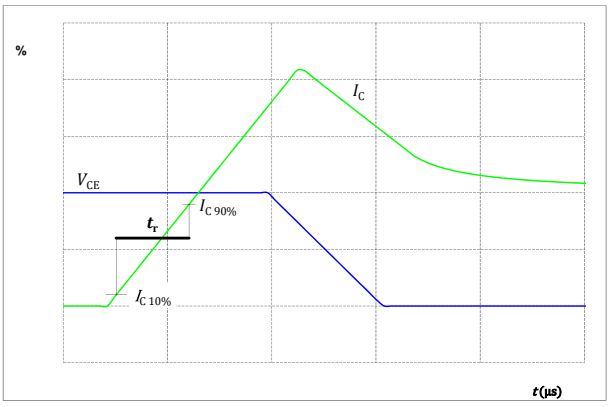


figure 28. **IGBT**

Turn-on Switching Waveforms & definition of t_r



Inverter Switching Definitions

figure 29. **FWD**

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

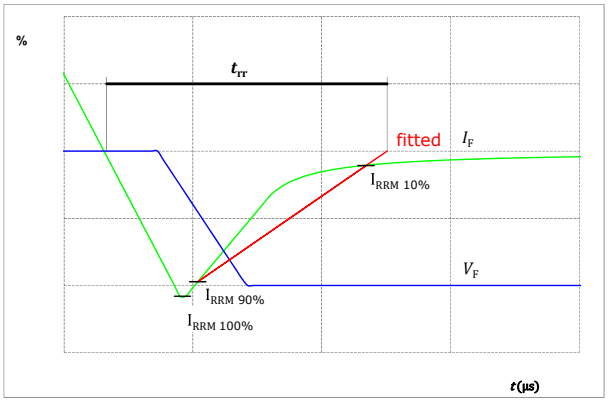
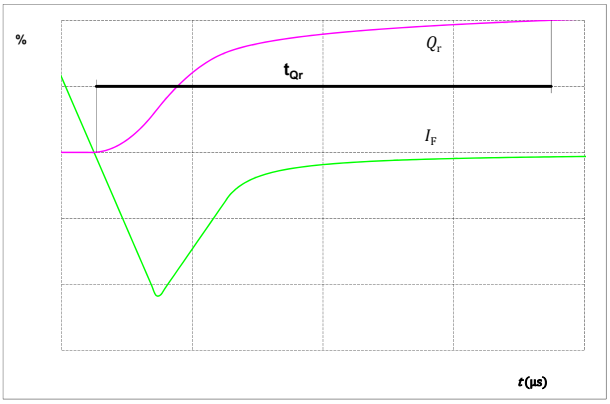


figure 30. **FWD**

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



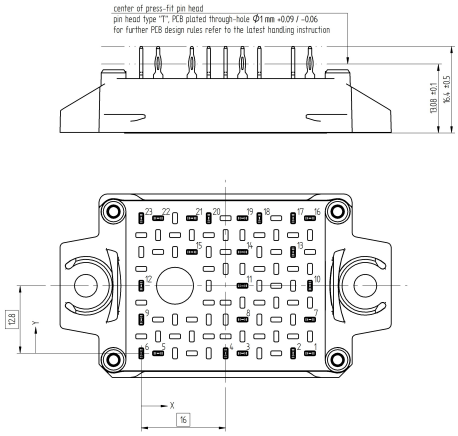
Ordering Code	
Version	**Ordering Code**
Without thermal paste	10-EZ126TB015M7-LS16F13T
With thermal paste (5,2 W/mK, PTM6000HV)	10-EZ126TB015M7-LS16F13T-/7/

Marking

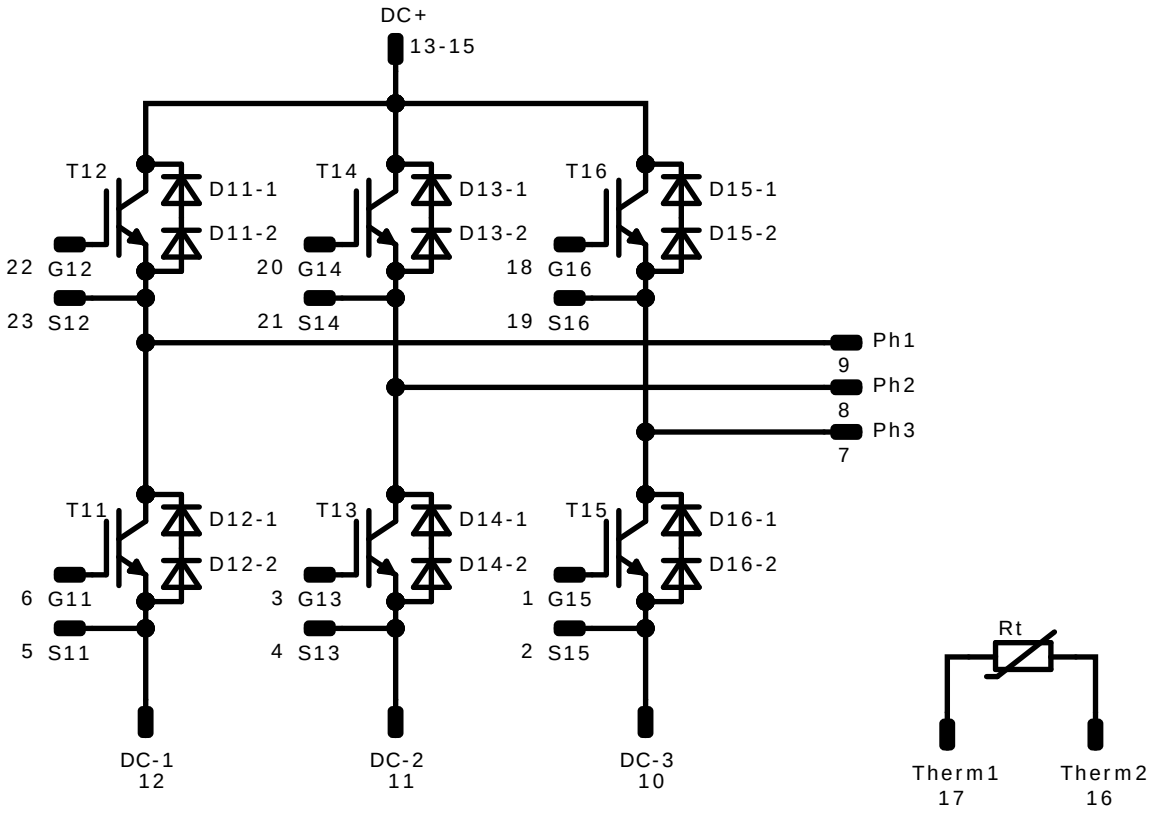
	Name		Date code	UL & VIN	Lot	Serial
Text	NN-NNNNNNNNNNNNNN-TTTTTTVV		WWYY	UL VIN	LLLLL	SSSS
Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
	TTTTTTVV	LLLLL	SSSS	WWYY		

Outline

Pin table [mm]			
Pin	X	Y	Function
1	32	0	G15
2	28,8	0	S15
3	19,2	0	G13
4	16	0	S13
5	3,2	0	S11
6	0	0	G11
7	32	6,4	Ph3
8	19,2	6,4	Ph2
9	0	6,4	Ph1
10	32	12,8	DC-3
11	19,2	12,8	DC-2
12	0	12,8	DC-1
13	28,8	19,2	DC+
14	19,2	19,2	DC+
15	9,6	19,2	DC+
16	32	25,6	Therm2
17	28,8	25,6	Therm1
18	22,4	25,6	G16
19	19,2	25,6	S16
20	12,8	25,6	G14
21	9,6	25,6	S14
22	3,2	25,6	G12
23	0	25,6	S12



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14, T15, T16	IGBT	1200 V	15 A	Inverter Switch	
D11, D12, D13, D14, D15, D16	FWD	1300 V	15 A	Inverter 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-EZ126TB015M7-LS16F13T-D1-14	6 Feb. 2026	Initial Release	