



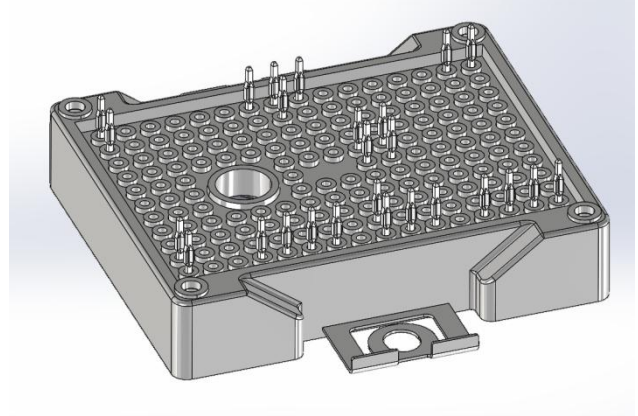
JLSD150V65RE2E7PN

Stack Boost Module with 650V Trench Stop IGBTs

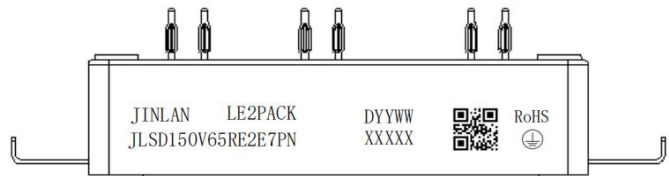


Features

- Electrical features
 - 650V Trench Stop IGBTs
 - Low Inductive Design
 - Low Switching Losses
 - Low Inductive Layout
 - Thermistor
- Mechanical features
 - Compact Design
 - Pressfit contact technology
 - Al₂O₃ Substrate with Low Thermal Resistance



LE2 Pack

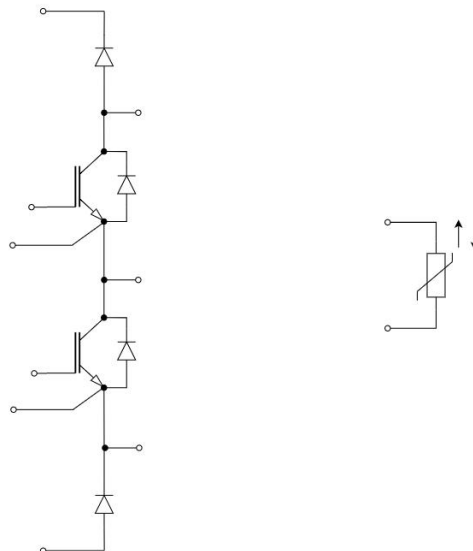


Typical Applications

- Welding

JINLAN	= Company Name
JLSD150V65RE2E7PN	= Specific Device Code
YYWW	= Year and Work Week Code
XXXXXX	= Serial Number
QR code	= Custom Assembly Information

Description





Package Insulation coordination

Parameter	Symbol	Note or test condition	Values	Unit
Isolation test voltage	V_{ISOL}	RMS, $f=50\text{Hz}$, $t=60\text{s}$	2.5	kV
Internal isolation		basic insulation(class 1, IEC 61140)	Al_2O_3	
Creepage distance	d_{creep}	terminal to heatsink	11.5	mm
Clearance	d_{clear}	terminal to heatsink	10	mm
Comparative tracking index (electrical)	CTI		>200	
RTI Elec.	RTI	housing	140	°C

Package Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Stray Inductance	LCE		--	20	--	nH
Module Lead Resistance, Terminal to Chip	RCC'+EE'		--	2	--	mΩ
Storage Temperature Range	T_{STG}		-40		125	°C
Mounting force per clamp	F		40	--	80	N
Weight	G		--	39	--	g



IGBT

Absolute Maximum Ratings (T_C = 25°C unless otherwise noted)

Symbol	Description	Value	Unit
V _{CES}	Collector-Emitter Voltage	650	V
V _{GES}	Gate-Emitter Voltage	±30	V
I _C	Collector Current @ T _C =25°C	150	A
	Collector Current @ T _C =100°C	300	A
I _{CM}	Pulsed Collector Current, t _p limited by T _{vj max}	175	A
P _{tot}	Total power dissipation, T _C = 25°C, T _{vj max} = 150°C	370	W

Characteristics (T_C=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C = 150A, V _{GE} = 15V	T _{vj} = 25 °C	--	1.35	V
			T _{vj} = 150°C	--	1.50	
V _{GE(TH)}	Gate-Emitter Threshold Voltage	I _C =3mA, V _{CE} =V _{GE}	4.0	--	5.5	V
I _{CES}	Collector-Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = 650 V	--	--	200	μA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} = ±30 V, V _{CE} = 0 V, T _{vj} = 25°C	--	--	±100	nA
R _{Gint}	Internal Gate Resistance	T _{vj} = 25 °C	--	1.45	--	Ω
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f=1MHz	--	11900	--	pF
C _{oes}	Output capacitance		--	505	--	pF
C _{res}	Reverse Transfer		--	71.4	--	pF
Q _G	Gate Charge	V _{CE} = 400 V, I _C = 150 A V _{GE} = -5 V to +15 V T _{vj} = 25 °C	--	0.356	--	μC
td(on)	Turn-On Delay Time	V _{CE} =400V, I _C =150A, V _{GE} = -5 V to +15 V, R _{Gon} =25Ω, R _{Goff} =50Ω T _{vj} = 25 °C	--	350	--	ns
t _r	Rise Time		--	50	--	
td(off)	Turn-off Delay Time		--	1220	--	
t _f	Fall Time		--	140	--	
E _{on}	Turn-On Switching Loss per Pulse		--	8.4	--	mJ
E _{off}	Turn Off Switching Loss per Pulse		--	15.4	--	
td(on)	Turn-On Delay Time	V _{CE} =400V, I _C =150A, V _{GE} = -5 V to +15 V, R _{Gon} =25Ω, R _{Goff} =50Ω T _{vj} = 150 °C	--	240	--	ns
t _r	Rise Time		--	60	--	
td(off)	Turn-off Delay Time		--	1220	--	
t _f	Fall Time		--	180	--	
E _{on}	Turn-on Switching Loss per Pulse		--	12.5	--	mJ
E _{off}	Turn Off Switching Loss per Pulse		--	14.7	--	
R _{thJC}	Thermal resistance	Junction-to-Case (per IGBT)	--	0.294	--	K/W
T _{vj op}		Temperature under switching conditions	-40		175 ¹⁾	°C

¹⁾T_{vj op} > 150°C is only allowed for operation at overload conditions.



Diode

Absolute Maximum Ratings (T_c = 25°C unless otherwise noted)

Symbol	Description	Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage	650	V
I _F	Diode Continuous Forward Current	150	A
I _{FM}	Diode Maximum Forward Current t _p =1ms	300	A

Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V _F	Diode Forward Voltage	I _F = 150 A, T _{vj} = 25 °C	--	1.60	2.3	V
		I _F = 150 A, T _{vj} = 150°C	--	1.40	--	
T _{rr}	Reverse Recovery Time	V _{CE} =400V, V _{GE} = -5 V to +15 V, I _F =150A,R _G =25Ω , T _{vj} = 25 °C	--	160	--	ns
I _{RM}	Peak Reverse Recovery Current		--	65	--	A
Q _{rr}	Recovered Charge		--	4.69	--	μC
E _{rec}	Reverse Recovery Energy		--	1.2	--	mJ
T _{rr}	Reverse Recovery Time	V _{CE} =400V, V _{GE} = -5 V to +15 V I _F =150A,R _G =25Ω, T _{vj} = 150°C	--	243	--	ns
I _{RM}	Peak Reverse Recovery Current		--	91.97	--	A
Q _{rr}	Recovered Charge		--	12.94	--	μC
E _{rec}	Reverse Recovery Energy		--	3.165	--	mJ
R _{thJC}	Thermal resistance	Junction-to-Case (per diode)	--	0.319	--	K/W
T _{vj op}		Temperature under switching conditions	-40		175 ²⁾	°C

²⁾T_{vj op} > 150°C is only allowed for operation at overload conditions.

NTC Characteristics (T_c = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
R ₂₅	Rated Resistance		--	5.0	--	kΩ
ΔR/R	Deviation of R100	T _C =100 °C, R ₁₀₀ =493.3Ω	-5	--	5	%
P ₂₅	Power Dissipation		--	--	20.0	mW
B _{25/50}	B-value	R ₂ =R ₂₅ exp[B _{25/50} (1/T ₂ - 1/(298.15K))]	--	3375	--	K
B _{25/80}	B-value	R ₂ =R ₂₅ exp[B _{25/80} (1/T ₂ - 1/(298.15K))]	--	3411	--	K
B _{25/100}	B-value	R ₂ =R ₂₅ exp[B _{25/100} (1/T ₂ - 1/(298.15K))]	--	3433	--	K

Figure1.output characteristic IGBT,Inverter(typical)
 $T_{vj}=25^{\circ}\text{C}$

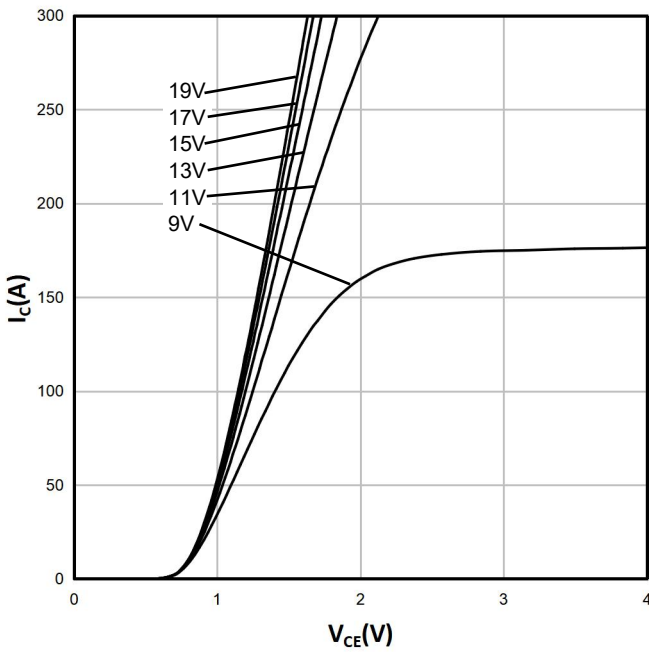


Figure2.output characteristic IGBT,Inverter(typical)
 $T_{vj}=150^{\circ}\text{C}$

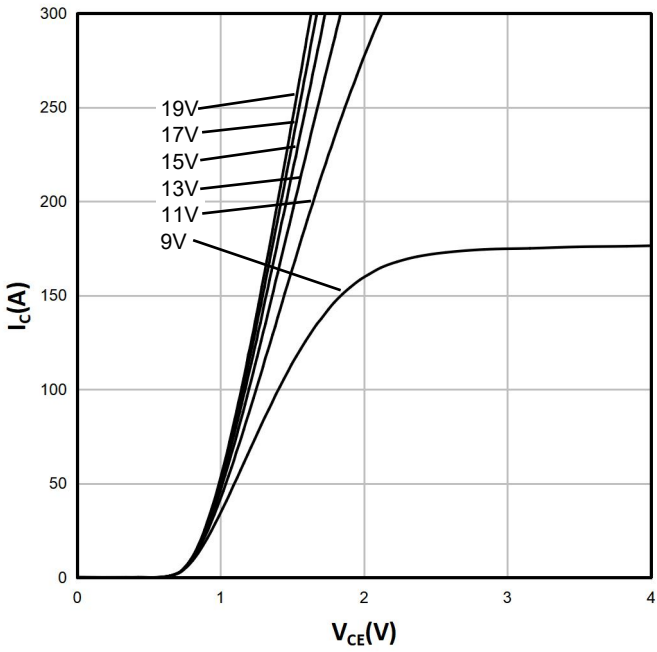


Figure3. $V_{CE(sat)}$ vs. Temperature

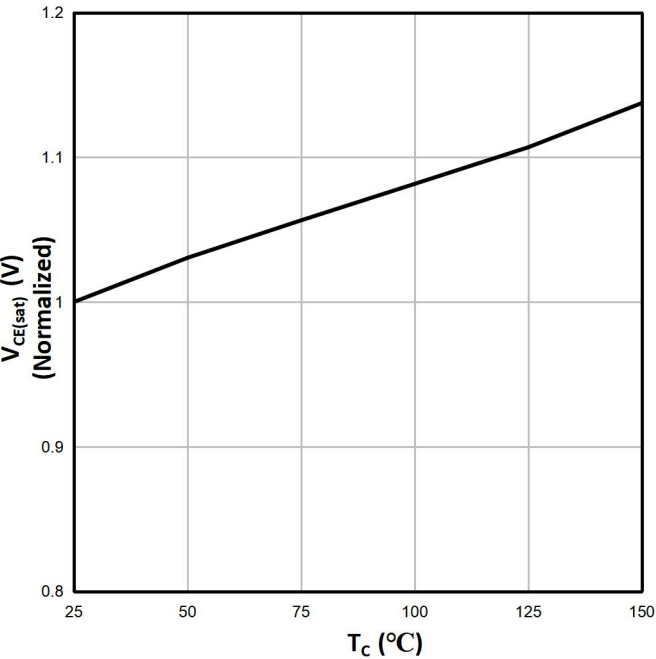


Figure4.transfer characteristic IGBT,Inverter(typical)
 $V_{CE}=20\text{V}$

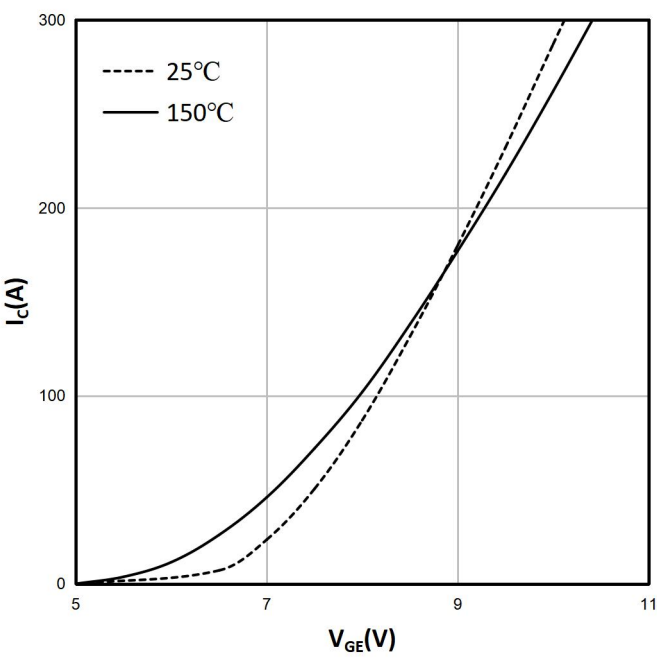


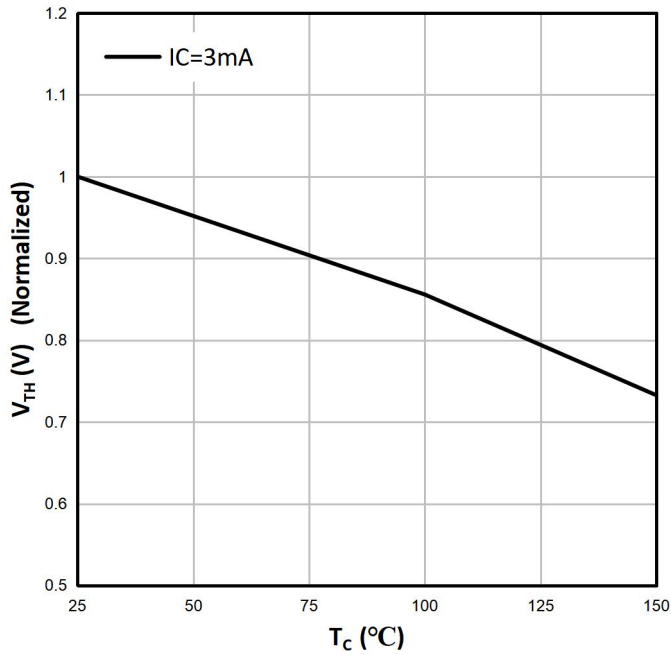
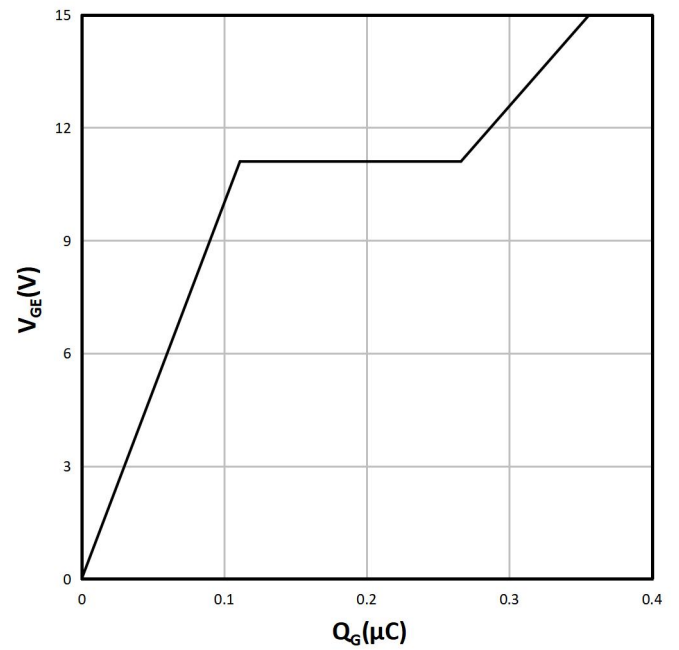
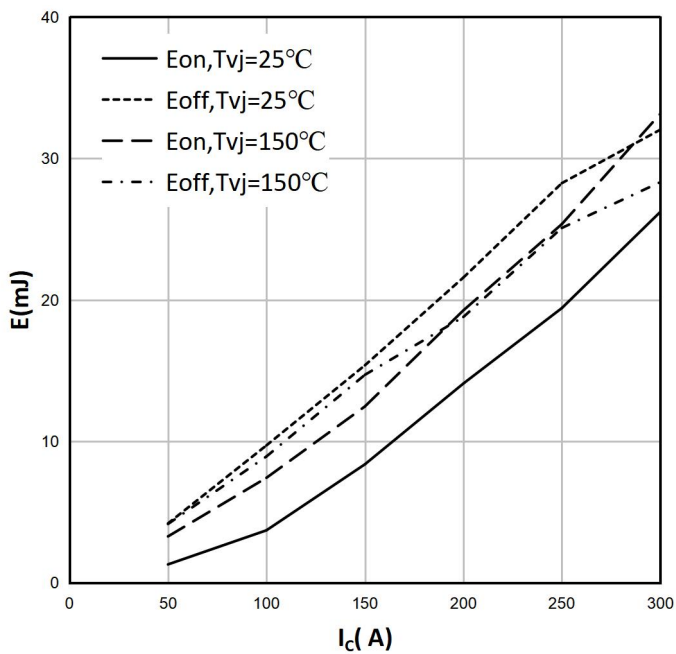
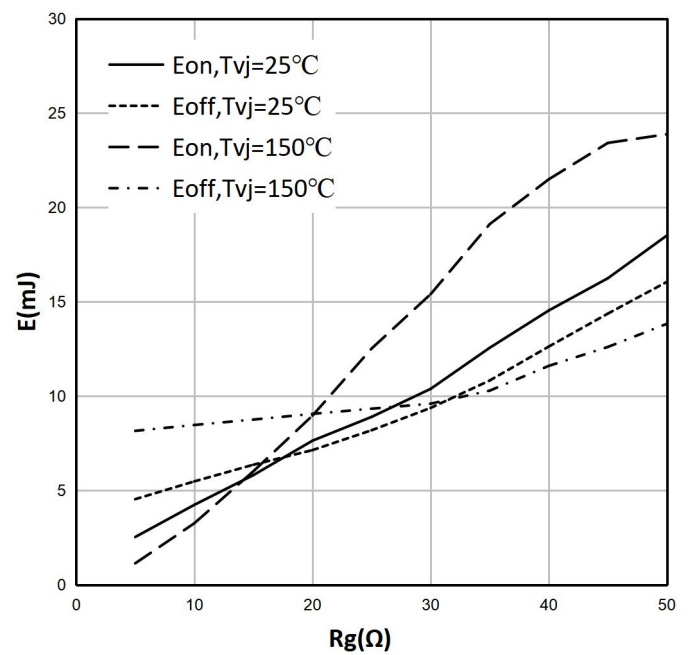
Figure5. V_{TH} vs. Temperature

Figure6. Gate Charge Waveform
 $V_{CC}=480V$

Figure7. switching losses IGBT, Inverter (typical)
 $V_{CC}=400V, R_{gon}=25\Omega, R_{goff}=50\Omega, V_{ge}=15V/-5V$

Figure8. switching losses IGBT, Inverter (typical)
 $V_{CC}=400V, I_C=150A, V_{ge}=15V/-5V$


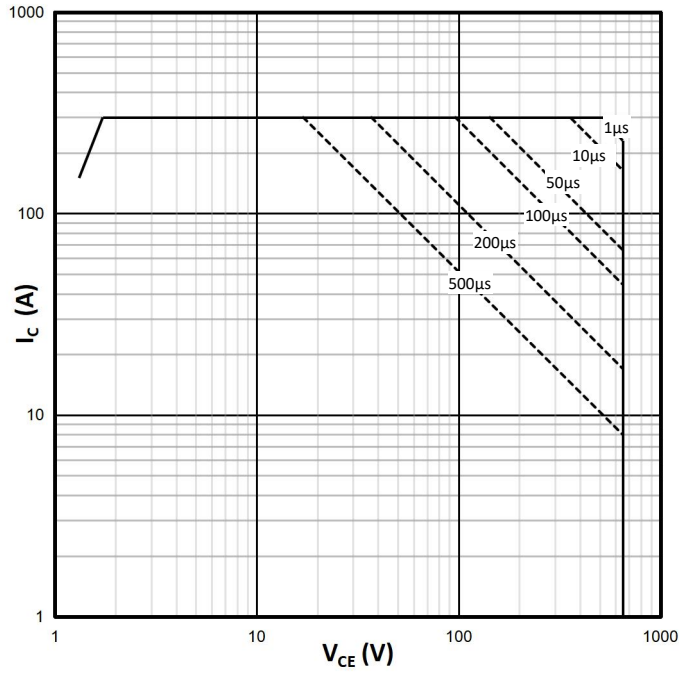
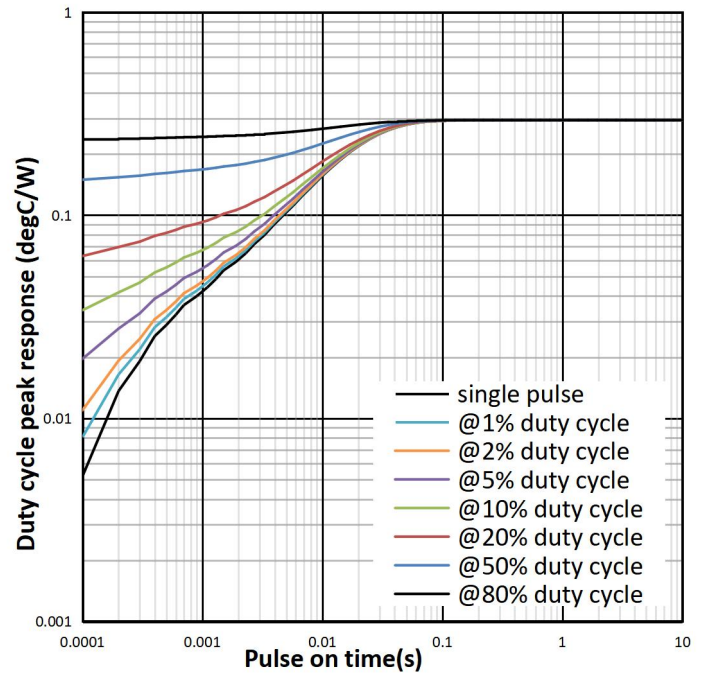
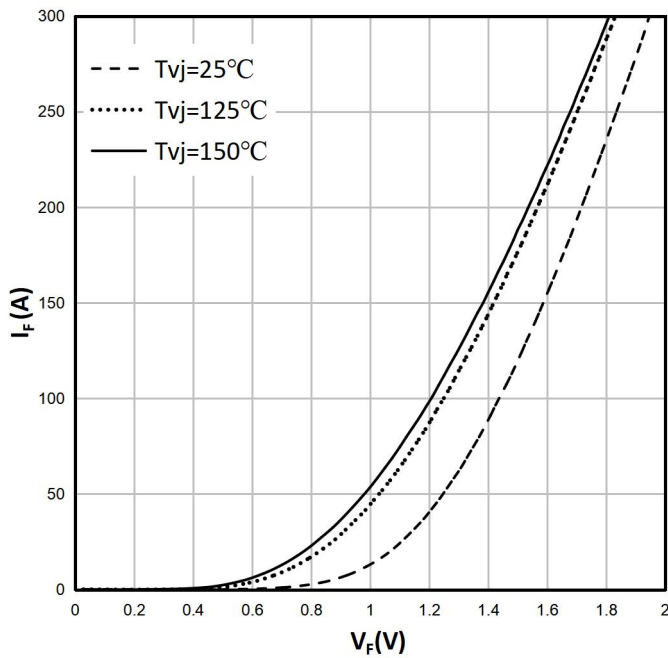
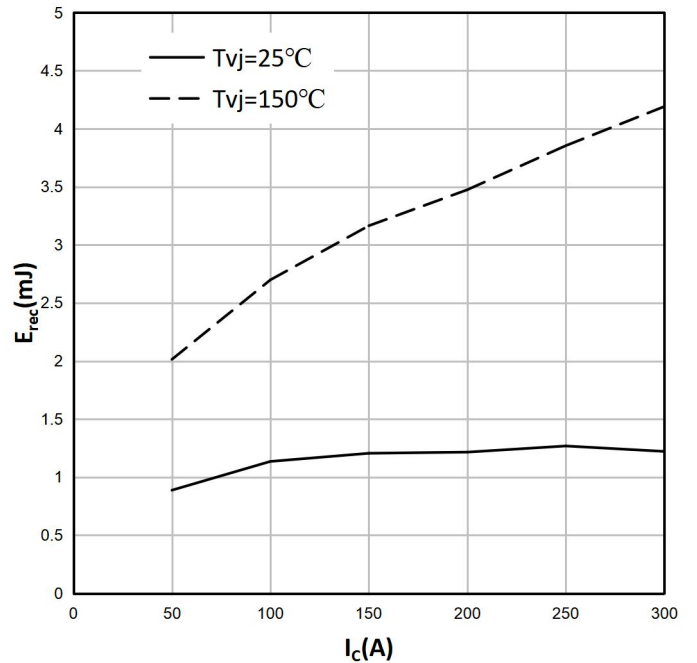
Figure9. FBSOA
 $D=0, T_c=25^{\circ}\text{C}, T_j \leq 175^{\circ}\text{C}, V_{ge}=15\text{V}$

Figure10. transient thermal impedance

Figure11. forward characteristic of Diode, Inverter(typical)
 $V_{GE}=0\text{V}$

Figure12.Reverse Recovery Energy Loss vs. IC
 $V_{cc}=400\text{V}, R_g=25\Omega, V_{ge}=15\text{V/-5V}$


Figure13.Reverse Recovery Energy Loss vs. R_G
 $V_{CC}=400V, I_C=150A, V_{GE}=15V/-5V$

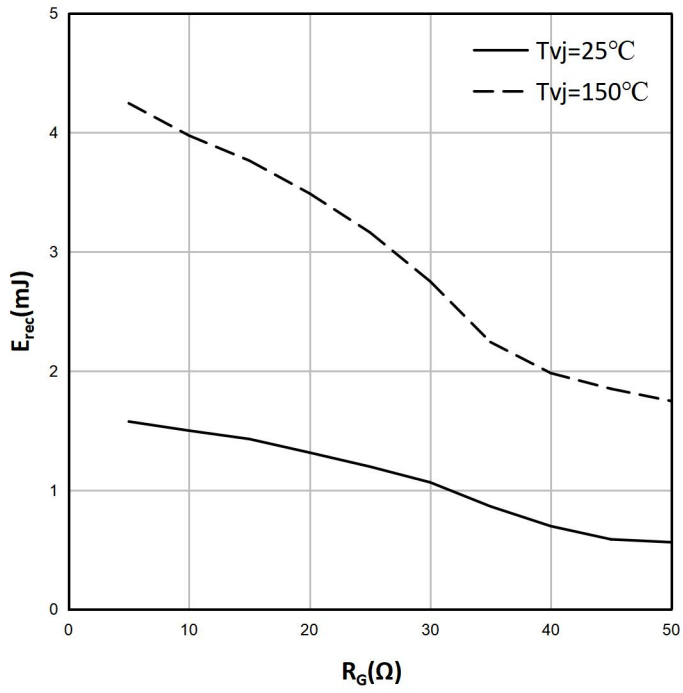
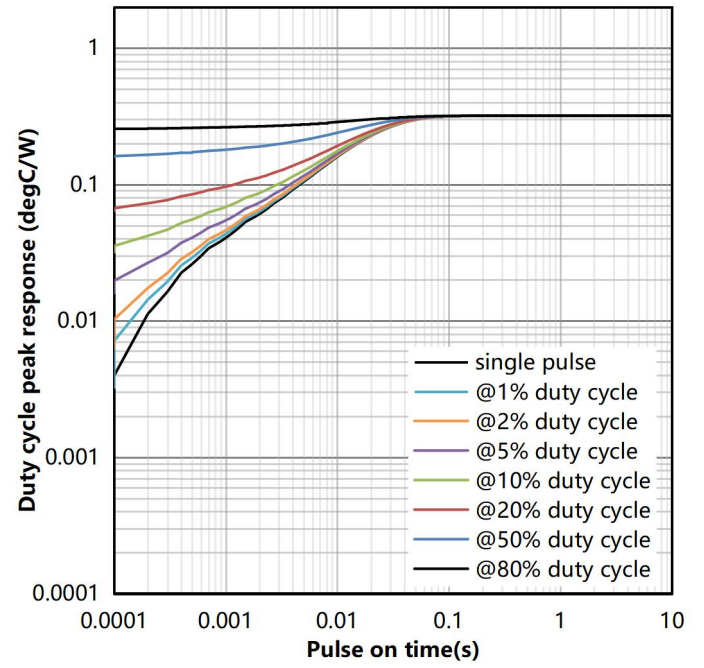
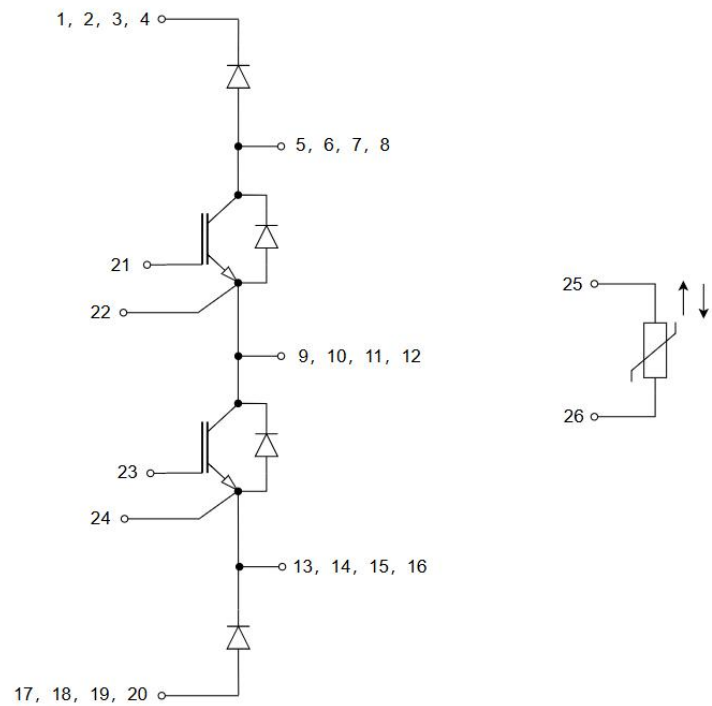


Figure14. transient thermal impedance-FRD



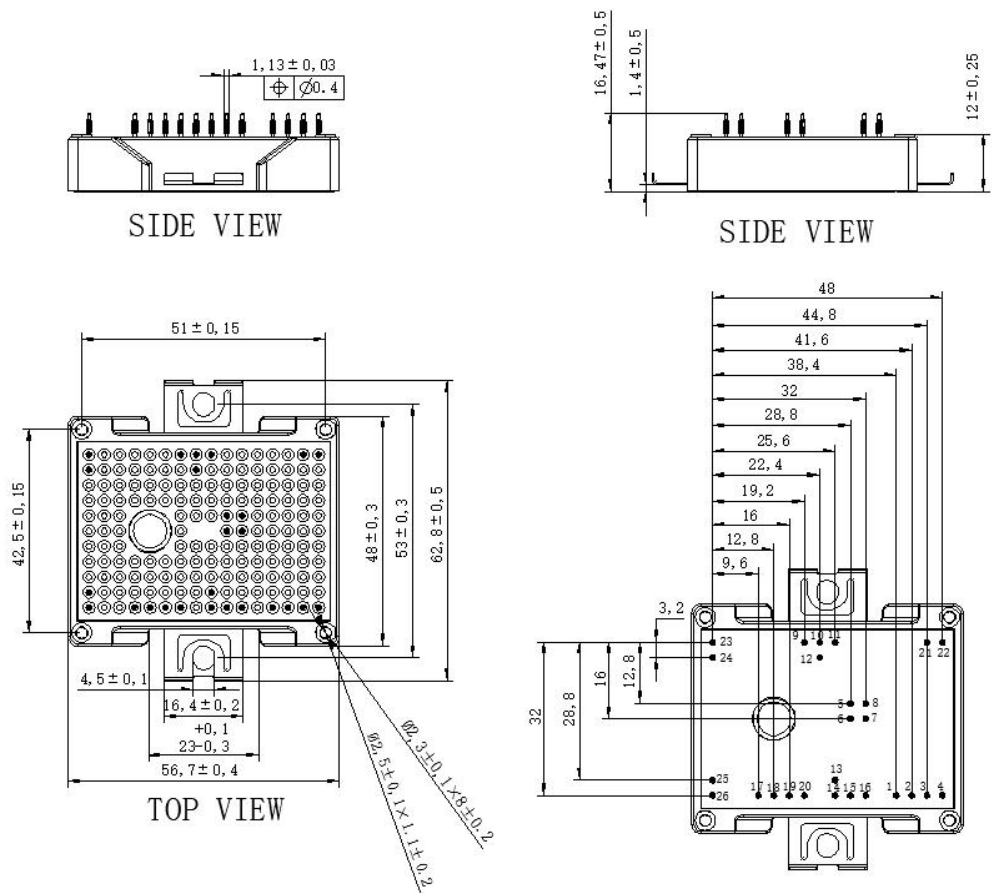


CIRCUIT DIAGRAM



PACKAGE DIMENSION

Dimensions in Millimeters





REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2025-02-14	Preview



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