



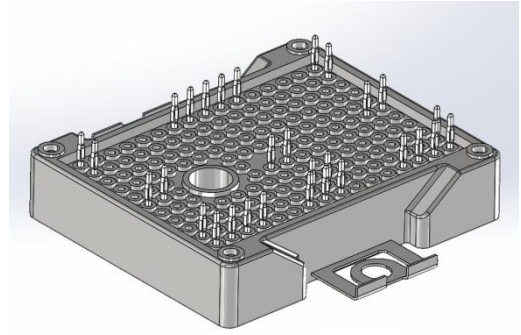
JLFP150V65RE2E7PN

LE2 PACK module with Trench/Fieldstop IGBT and Emitter Controlled diode and NTC



Features

- Low $V_{CE(sat)}$ Trench IGBT technology
- $V_{CE(sat)}$ with positive temperature coefficient
- Overload operation up to 175°C
- Low inductance case
- Isolated heatsink using DBC technology
- Pressfit contact technology



LE2 Pack

Typical Applications

- Inductive Heating and Welding
- DC/DC converter
- High Frequency Switching Application
- Auxiliary Inverters



JINLAN

= Company Name

JLFP150V65RE2E7PN

= Specific Device Code

YYWW

= Year and Work Week Code

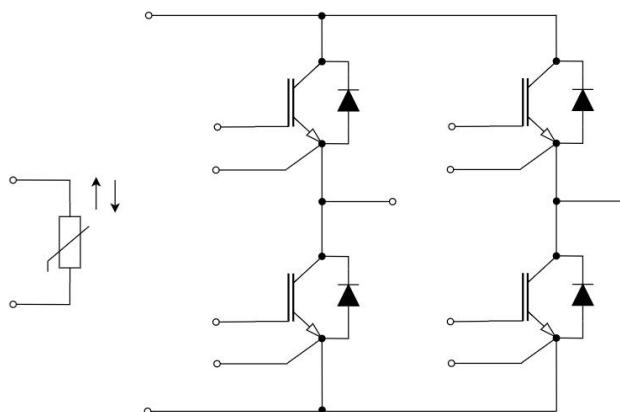
XXXXX

= 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=50Hz, t=60s	2.5	kV
Internal isolation		basic insulation(class 1, IEC 61140)	Al_2O_3	
Creepage distance	d_{creep}	terminal to heatsink	11.5	mm
Creepage distance	d_{creep}	terminal to terminal	9.4	mm
Clearance	d_{clear}	terminal to heatsink	10	mm
Clearance	d_{clear}	terminal to terminal	8	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		--	35	--	nH
Module Lead Resistance, Terminal to Chip	$R_{CC'+EE'}$		--	3.00	--	mΩ
Storage Temperature Range	T_{STG}		-40		125	°C
Mounting force per clamp	F		40		80	N
Weight	G			41		g



IGBT (T1,T2,T3,T4)

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	1.90	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
t _{d(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	--	
t _{d(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	--	
t _{d(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	--	
t _{d(off)}	Turn–off Delay Time			--	1220	--	
t _f	Fall Time			--	180	--	
E _{on}	Turn–on Switching Loss per Pulse					--	12.5
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(D1,D2,D3,D4)

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



Figure2.output characteristic IGBT,Inverter(typical)
 $T_{vj}=25^{\circ}\text{C}$ $T_{vj}=150^{\circ}\text{C}$

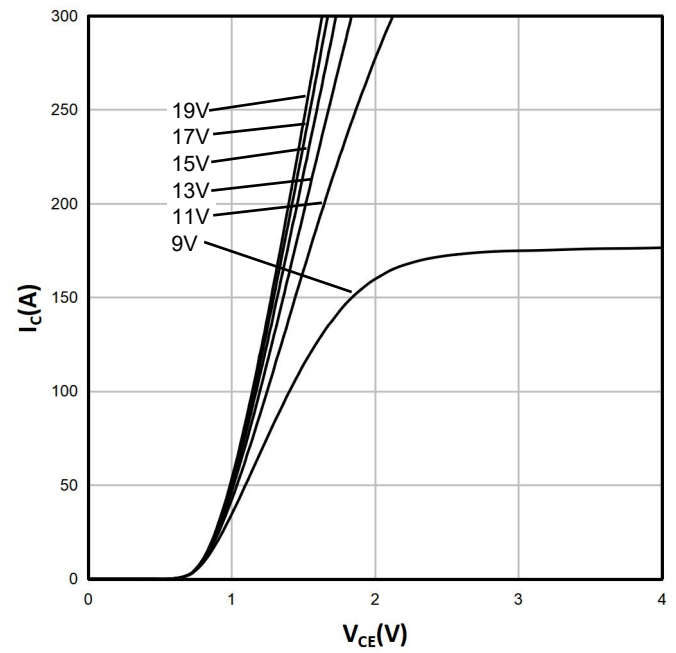
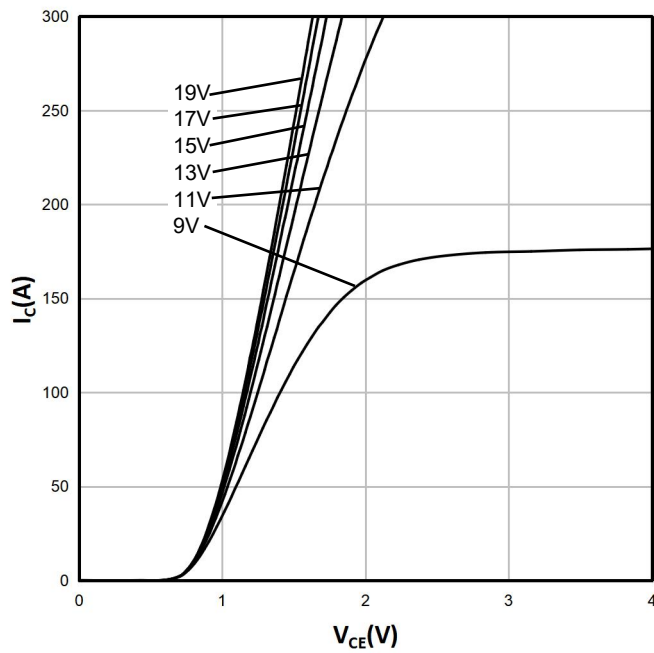


Figure3. V_{CE(sat)} vs. Temperature

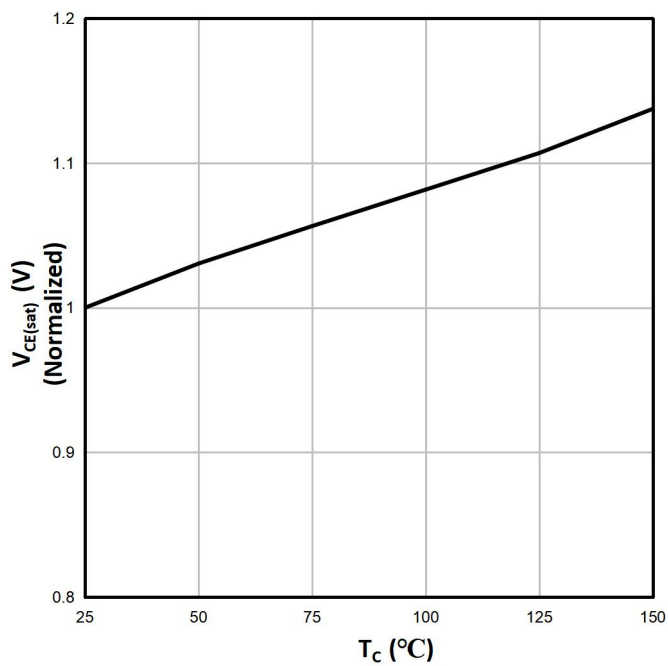
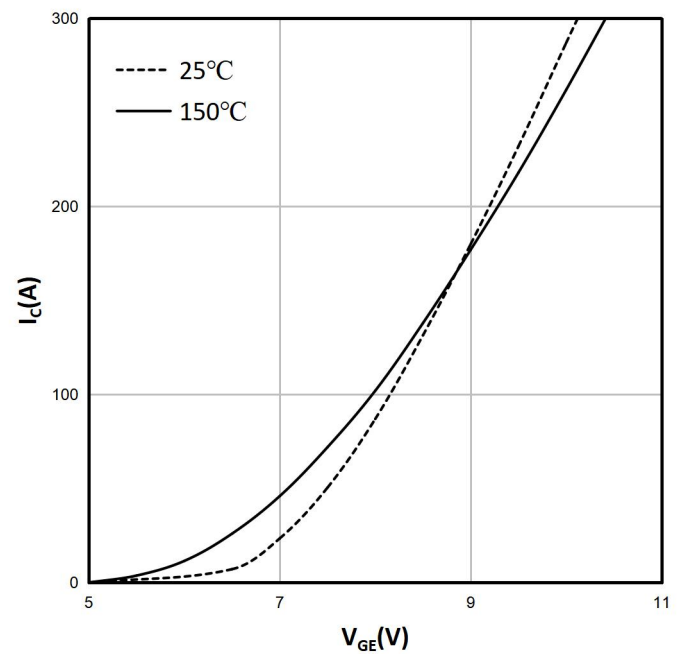
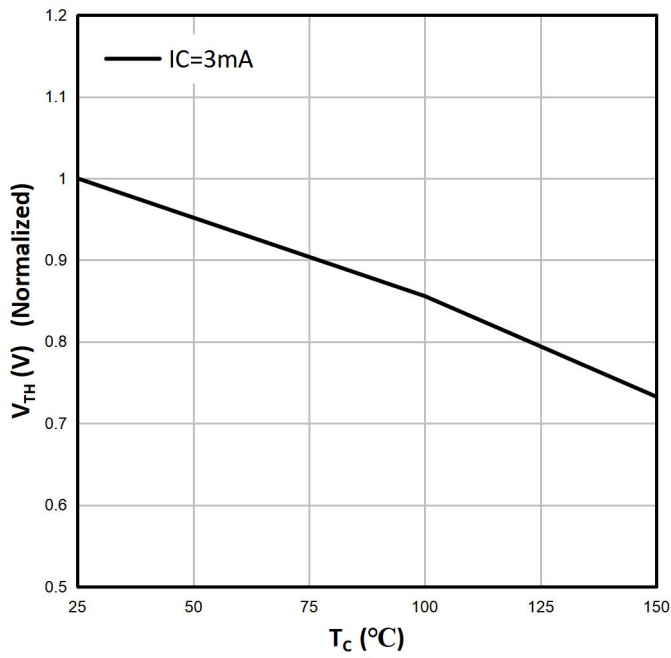
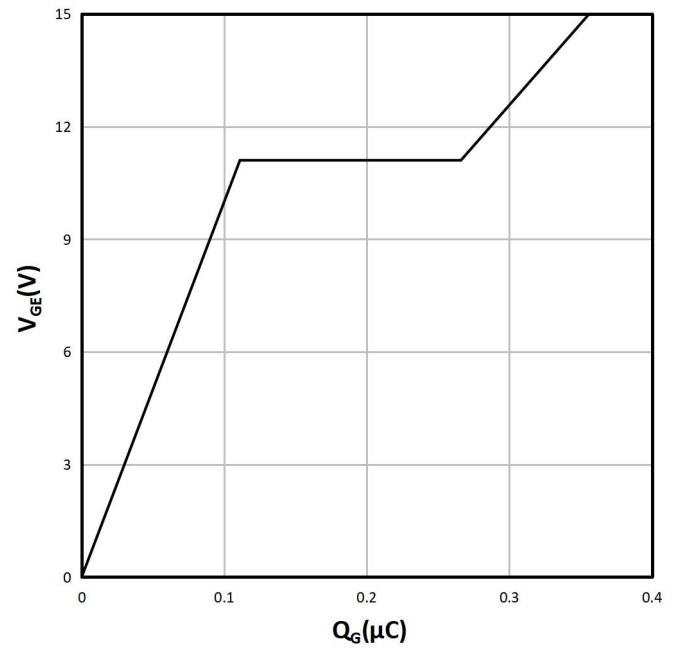
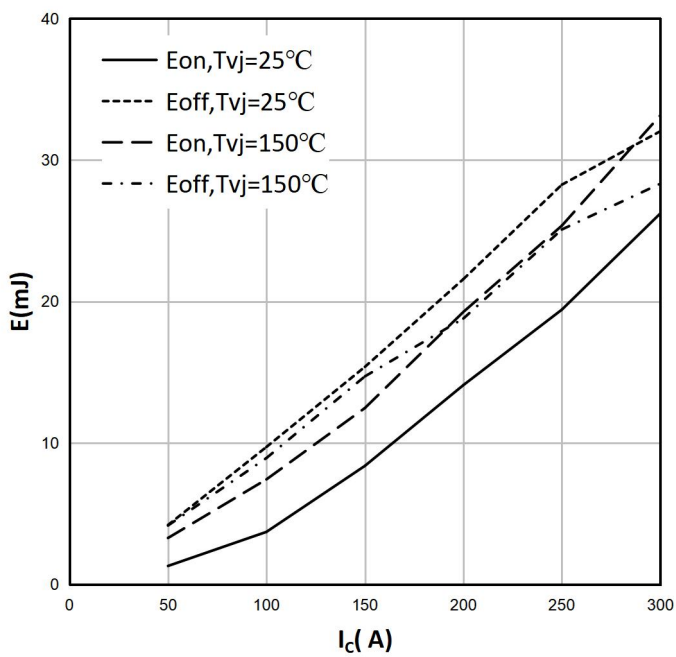
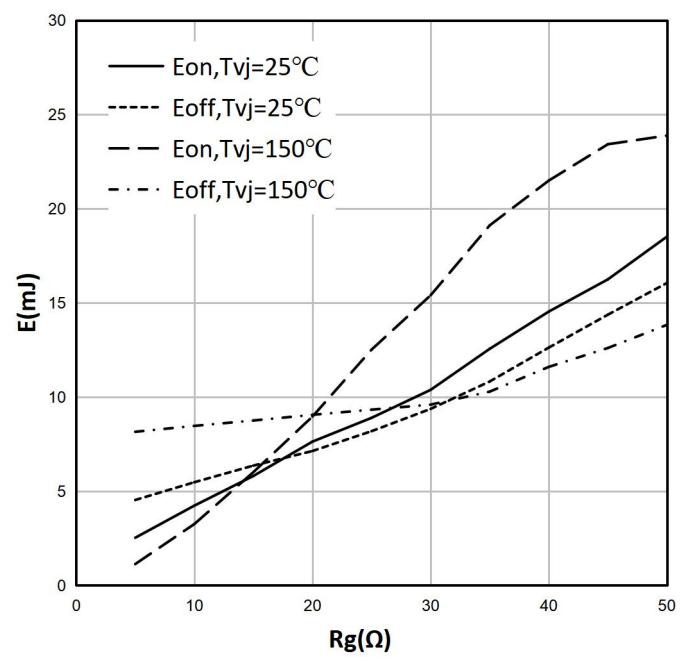


Figure4.transfer characteristic IGBT,Inverter(typical)
 $V_{CE}=20\text{V}$



**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)** $V_{CC}=400V, I_C=150A, V_{ge}=15V/-5V$ 

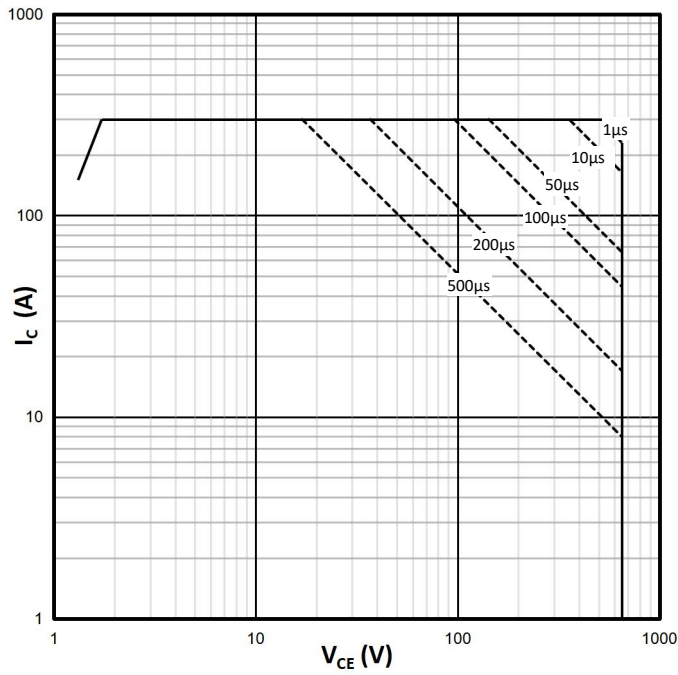
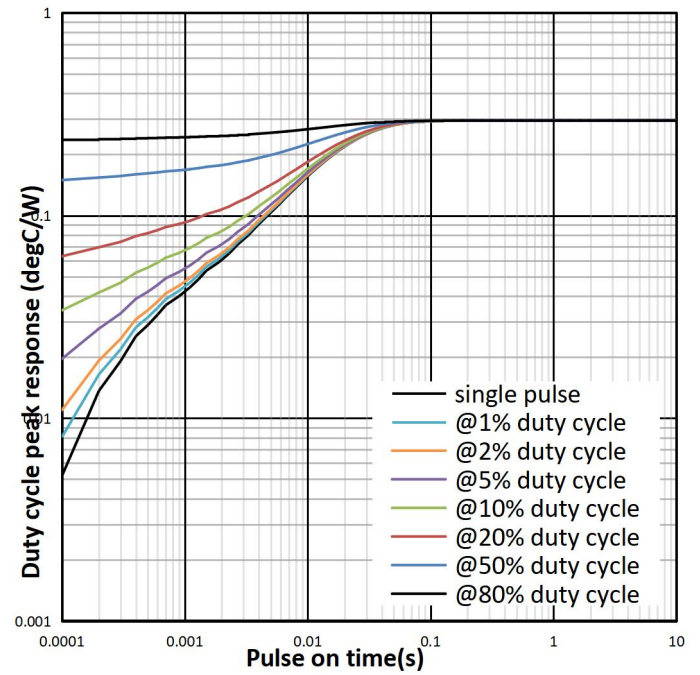
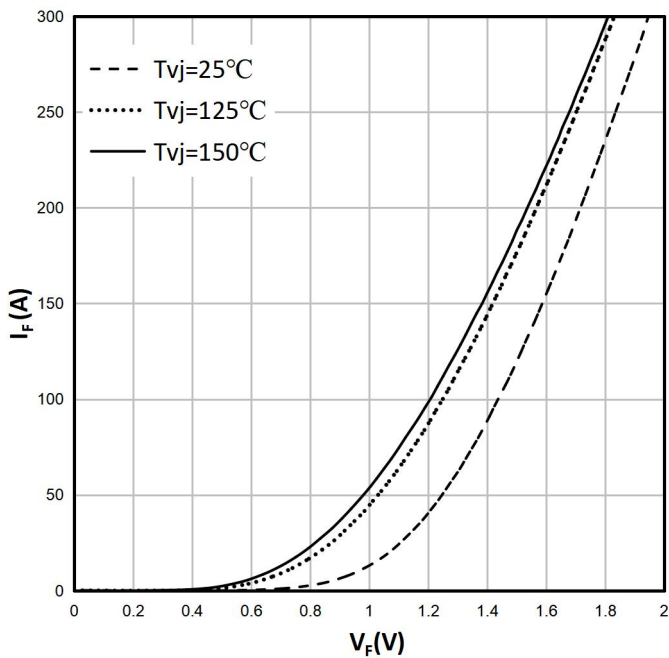
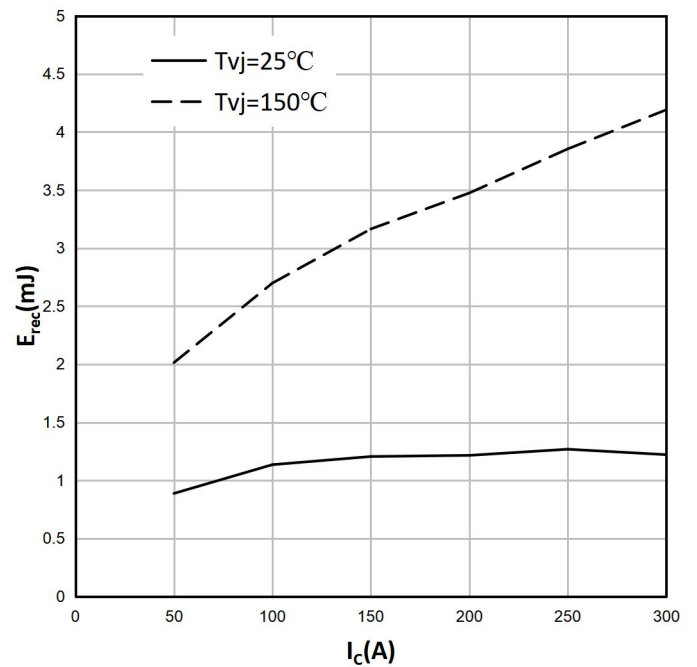
**Figure9. FBSOA** $D=0$, $T_c=25^{\circ}\text{C}$, $T_j\leq 175^{\circ}\text{C}$, $V_{ge}=15\text{V}$ **Figure10. transient thermal impedance****Figure11. forward characteristic of Diode, Inverter (typical)** $V_{GE}=0\text{V}$ **Figure12. Reverse Recovery Energy Loss vs. I_C** $V_{cc}=400\text{V}$, $R_g=25\Omega$, $V_{ge}=15\text{V}/-5\text{V}$ 



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

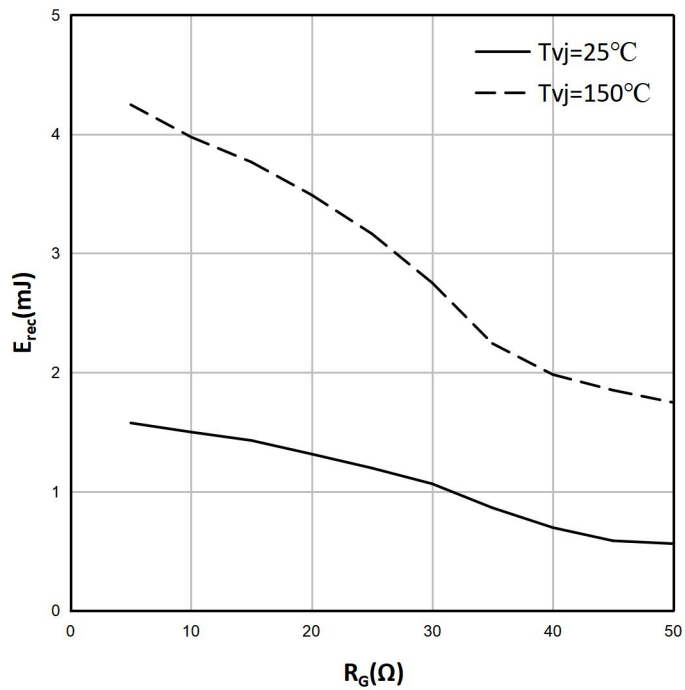
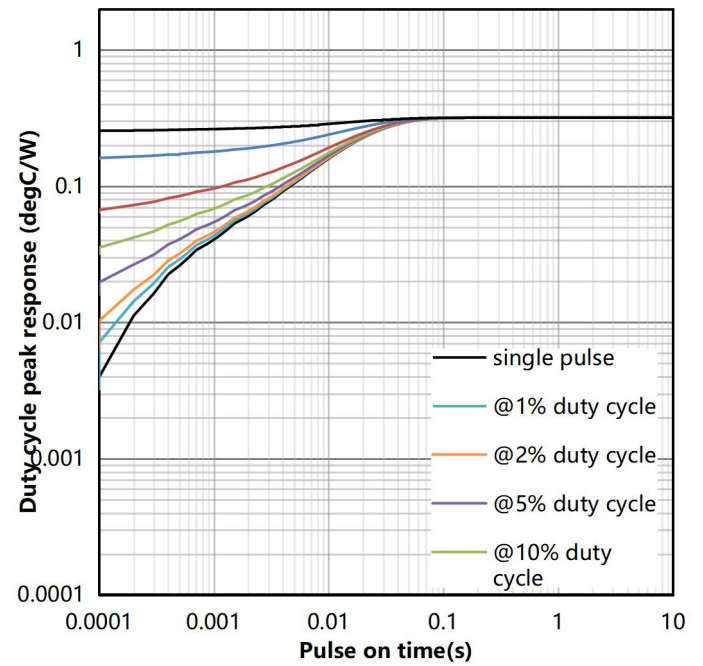
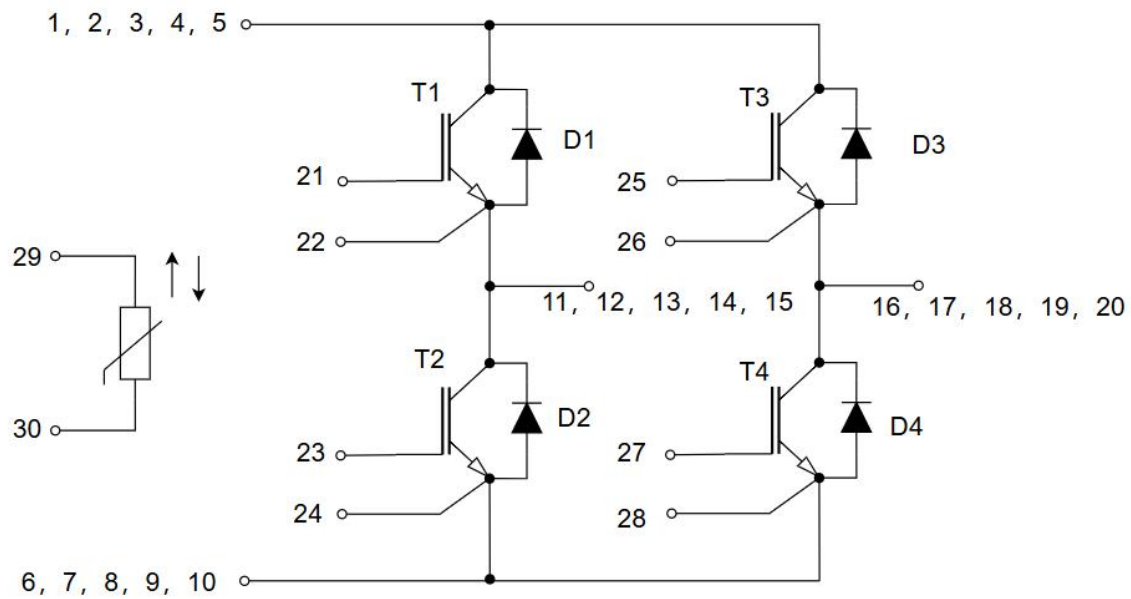


Figure14. transient thermal impedance-FRD

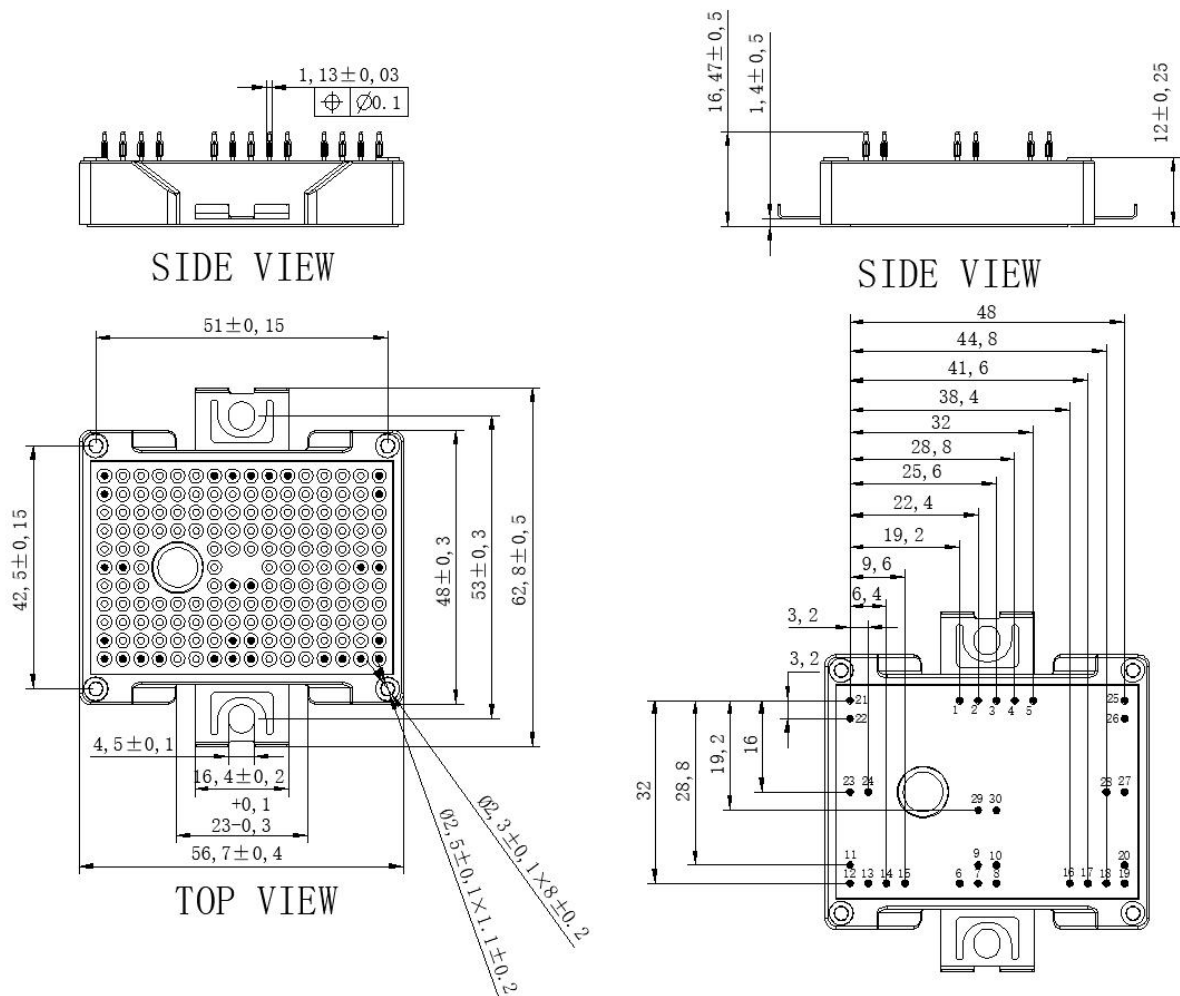




CIRCUIT DIAGRAM



PACKAGE DIMENSION





REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2024-11-14	Preview
Rev.01	2025-02-14	Add Chart



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