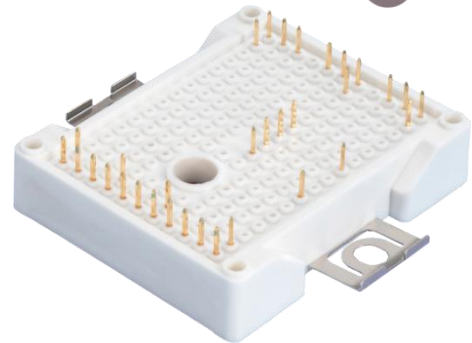


JLAFF50B140RE2E7SN

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

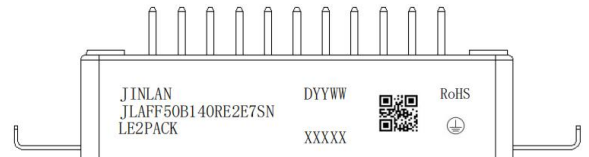
Features

- Low $V_{CE(sat)}$ Trench IGBT technology
- 10 μ s short circuit capability
- $V_{CE(sat)}$ with positive temperature coefficient
- Overload operation up to 175°C
- Low inductance case
- Isolated heatsink using DBC technology



LE2 Pack

MARKING DIAGRAM



Typical Applications

- Servo drives
- UPS systems
- Motor drives
- Air conditioning
- Auxiliary inverters

JINLAN

JLAFF50B140RE2E7SN

DYYWW

XXXXX

QR code

= Company Name

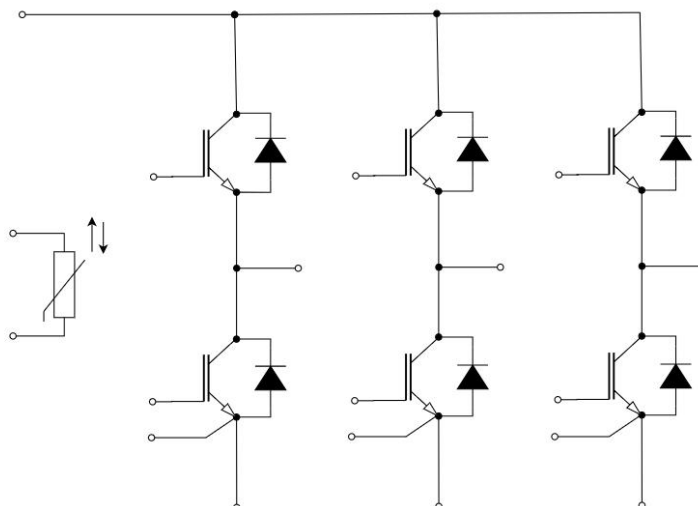
= Specific Device Code

= Year and Work Week Code

= Serial Number

= Custom Assembly

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	6.3	mm
Clearance	d_{clear}	terminal to heatsink	10	mm
Clearance	d_{clear}	terminal to terminal	5	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		--	40	--	nH
Module Lead Resistance, Terminal to Chip	RCC'+EE'		--	4.00	--	mΩ
Storage Temperature Range	T _{STG}		-40		125	°C
Mounting force per clamp	F		40		80	N
Weight	G			41		g



IGBT

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

Symbol	Description	Value	Unit
V _{CES}	Collector-Emitter Voltage	1400	V
V _{GES}	Gate-Emitter Voltage	±30	V
I _C	Collector Current @ T _C =25°C	100	A
	Collector Current @ T _C =80°C	50	A
I _{CM}	Pulsed Collector Current, t _p =1S	225	A
P _{tot}	Total power dissipation, T _C = 25°C, T _{vj max} = 150°C	263.9	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 =50A, V _{GE} =15V	T _{vj} =25°C	--	1.8	2.8	V
			T _{vj} = 150°C	--	2.3	--	
V _{GE(th)}	Gate Threshold Voltage	I _C =1mA,V _{CE} =V _{GE}		5	6	7	V
I _{CES}	Collector-Emitter Leakage Current	V _{GE} =0V,V _{CE} =1200V		--	--	1	mA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} =30V,V _{CE} =0V		--	--	100	nA
R _{Gint}	Internal Gate Resistance	f=1MHz		--	2.16	--	Ω
C _{ies}	Input Capacitance	V _{CE} =25V,V _{GE} =0V, f=1MHz		--	5.04	--	nF
C _{oes}	Out Capacitance			--	0.223	--	nF
C _{res}	Reverse Transfer			--	0.033	--	nF
Q _G	Gate Charge	V _{GE} = ± 15 V		--	0.33	--	μC
t _{d(on)}	Turn–On Delay Time	T _J = 25°C V _{CE} =700V, I _C =50A V _{GE} = ± 15V, R _{Gon} =10Ω, R _{Goff} =10Ω Inductive Load		--	0.037	--	μs
t _r	Rise Time			--	0.014	--	
t _{d(off)}	Turn–off Delay Time			--	0.23	--	
t _f	Fall Time			--	0.15	--	
E _{on}	Turn–On Switching Loss per Pulse			--	6.76	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	2.33	--	
t _{d(on)}	Turn–On Delay Time	T _J = 150°C V _{CE} =700V, I _C =50A V _{GE} = ± 15V, R _{Gon} =10Ω, R _{Goff} =10Ω Inductive Load		--	0.054	--	μs
t _r	Rise Time			--	0.032	--	
t _{d(off)}	Turn–off Delay Time			--	0.22	--	
t _f	Fall Time			--	0.27	--	
E _{on}	Turn–on Switching Loss per Pulse			--	11.2	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	5.46	--	
I _{SC}	SC Data	V _{GE} =15V,V _{CC} ≤800V, t _{SC} ≤10us,T _J ≤150°C		--	145	--	A
R _{thJC}	Thermal resistance	Junction-to-Case (per IGBT)			0.423		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	1400	V
I _F	Diode Continuous Forward Current	50	A
I _{FM}	Diode Maximum Forward Current t _p =1ms	150	A

Characteristics (T_C=25°C unless otherwise noted)

Symbol	Parameter	Note or Test Condition		Min	Typ	Max	Unit
V _F	Diode Forward Voltage	I _F = 50, V _{GE} = 0 V	T _J = 25°C	--	1.80	2.80	V
			T _J = 150°C	--	1.70	--	
Q _{rr}	Reverse Recovery Charge	T _J = 25°C		--	5.6	--	μC
I _{RRM}	Peak Reverse Recovery Current	V _{CE} =700V, I _C =50A		--	33.4	--	A
E _{REC}	Reverse Recovery Energy	V _{GE} = ± 15V, R _{Gon} =10Ω, R _{Goff} =10Ω		--	2.67	--	mJ
Q _{rr}	Reverse Recovery Charge	T _J = 150°C		--	15.4	--	μC
I _{RRM}	Peak Reverse Recovery Current	V _R =700 V, I _C =50A		--	32.5	--	A
E _{REC}	Reverse Recovery Energy	V _{GE} = ± 15V, R _{Gon} =10Ω, R _{Goff} = 10Ω		--	6.6	--	mJ
R _{thJC}	Thermal Resistance – Chip-to-Case				0.685		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

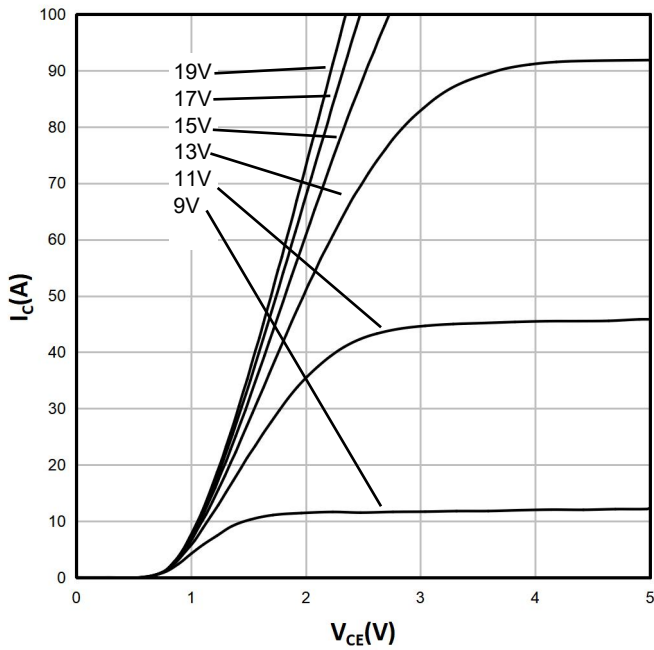
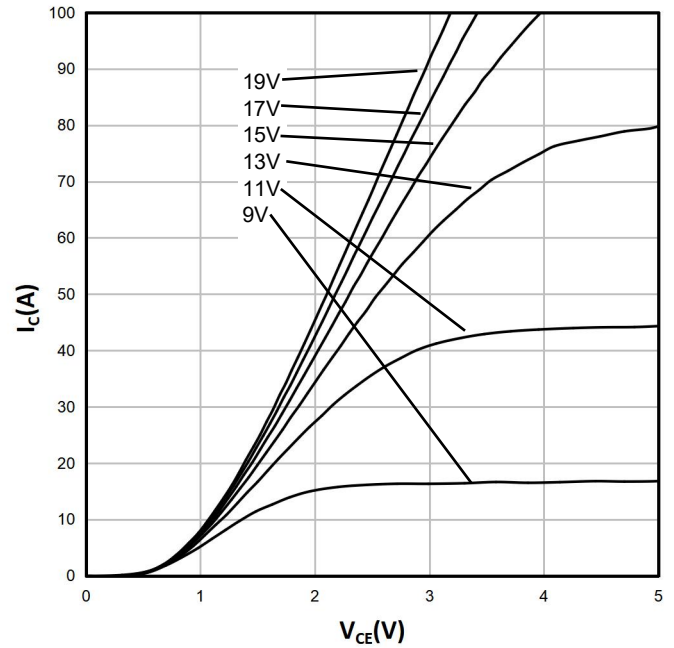
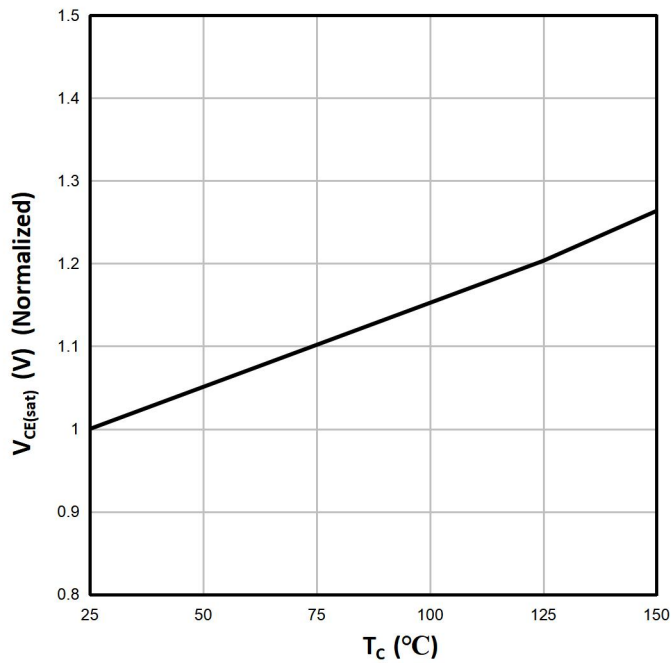
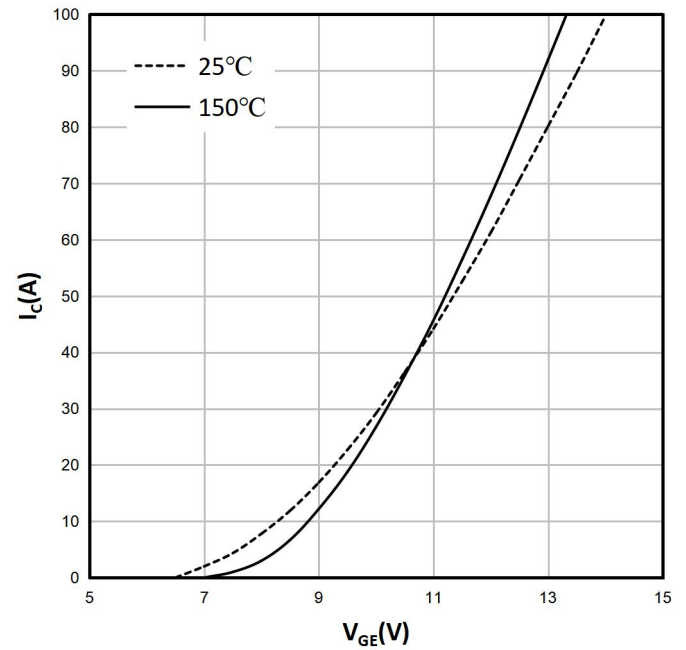
Figure1.output characteristic IGBT(typical)
 $T_{vj}=25^{\circ}\text{C}$

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

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

Figure4.transfer characteristic IGBT
 $V_{CE}=20\text{V}$


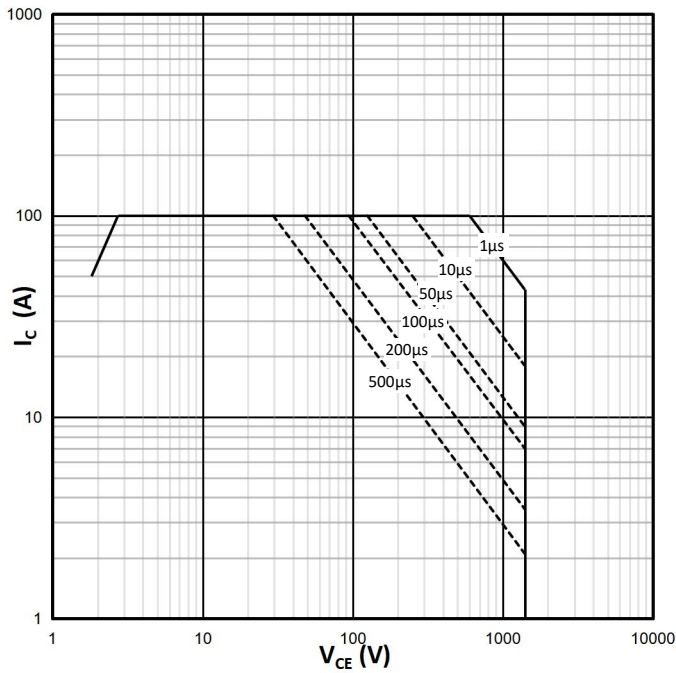
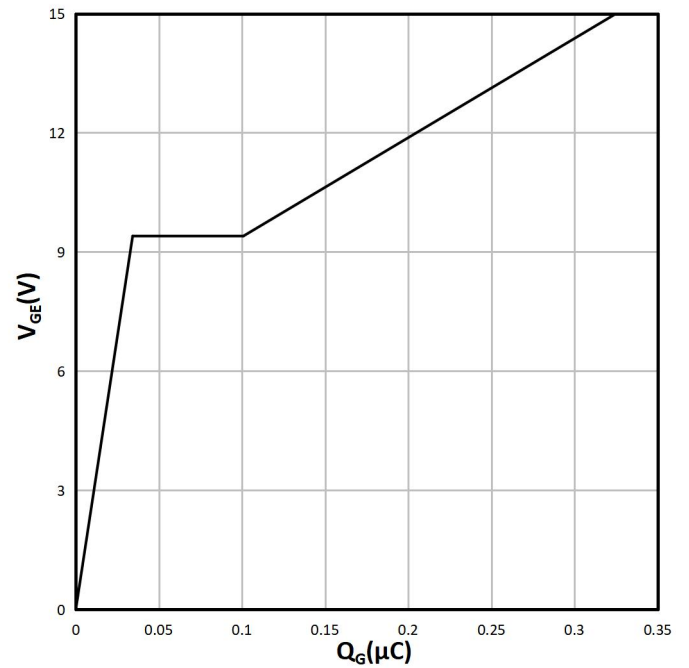
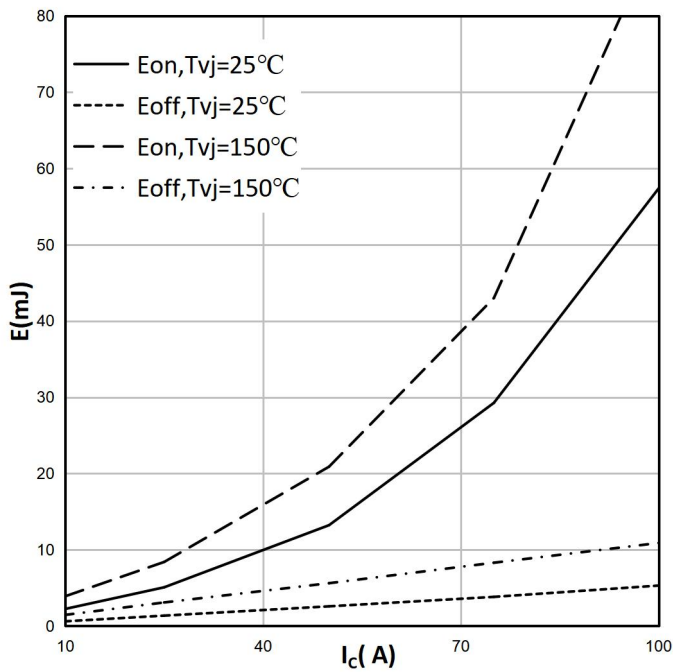
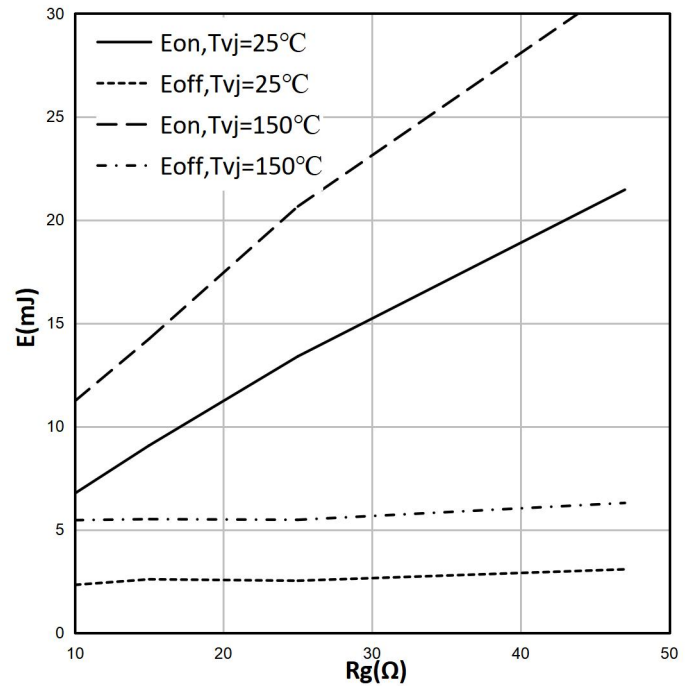
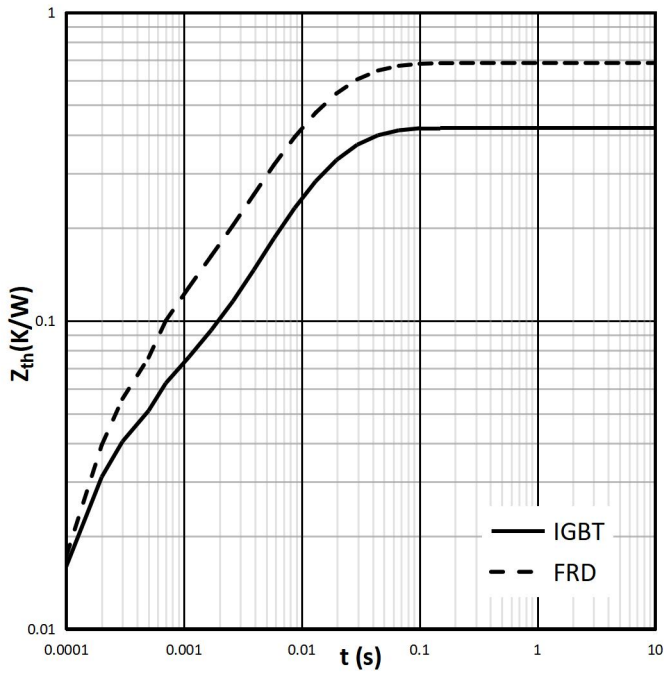
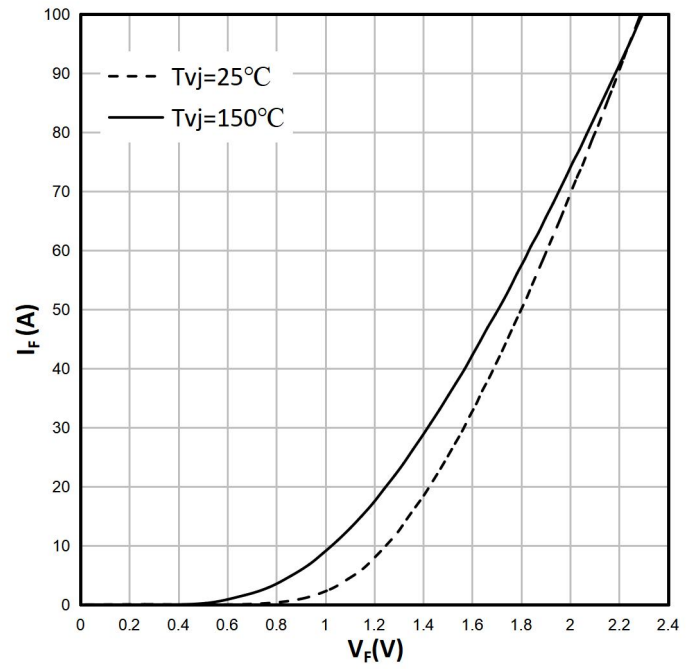
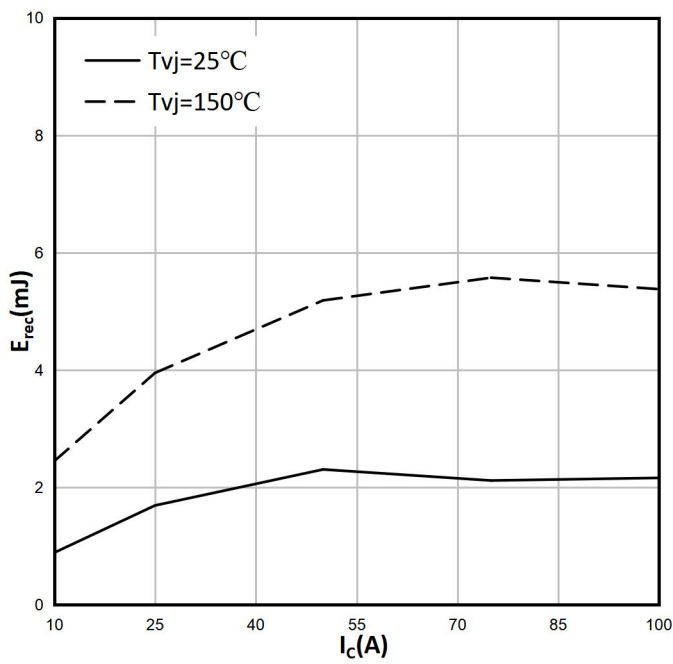
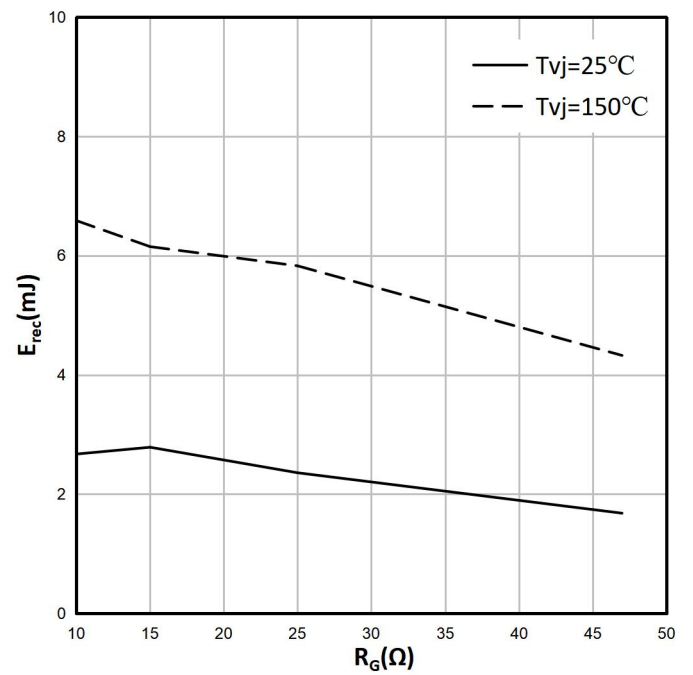
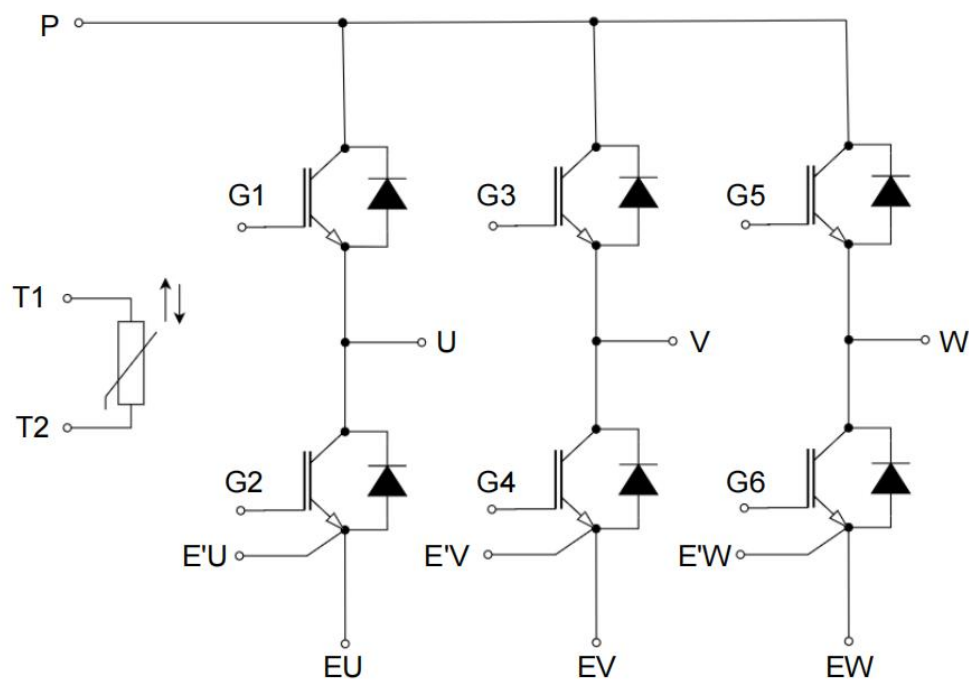
Figure5. FBSOA IGBT
 $D=0$, $T_c=25^{\circ}\text{C}$, $T_j\leq 175^{\circ}\text{C}$, $V_{ge}=15\text{V}$

Figure6. Gate Charge Waveform
 $V_{cc}=700\text{V}$, $I_c=50\text{A}$, $V_{ge}=15\text{V}$

Figure7. switching losses IGBT (typical)
 $V_{cc}=700\text{V}$, $R_{gon}=25\Omega$, $R_{goff}=25\Omega$, $V_{ge}=\pm 15\text{V}$

Figure 8. switching losses IGBT (typical)
 $V_{cc}=700\text{V}$, $I_c=50\text{A}$, $V_{ge}=\pm 15\text{V}$


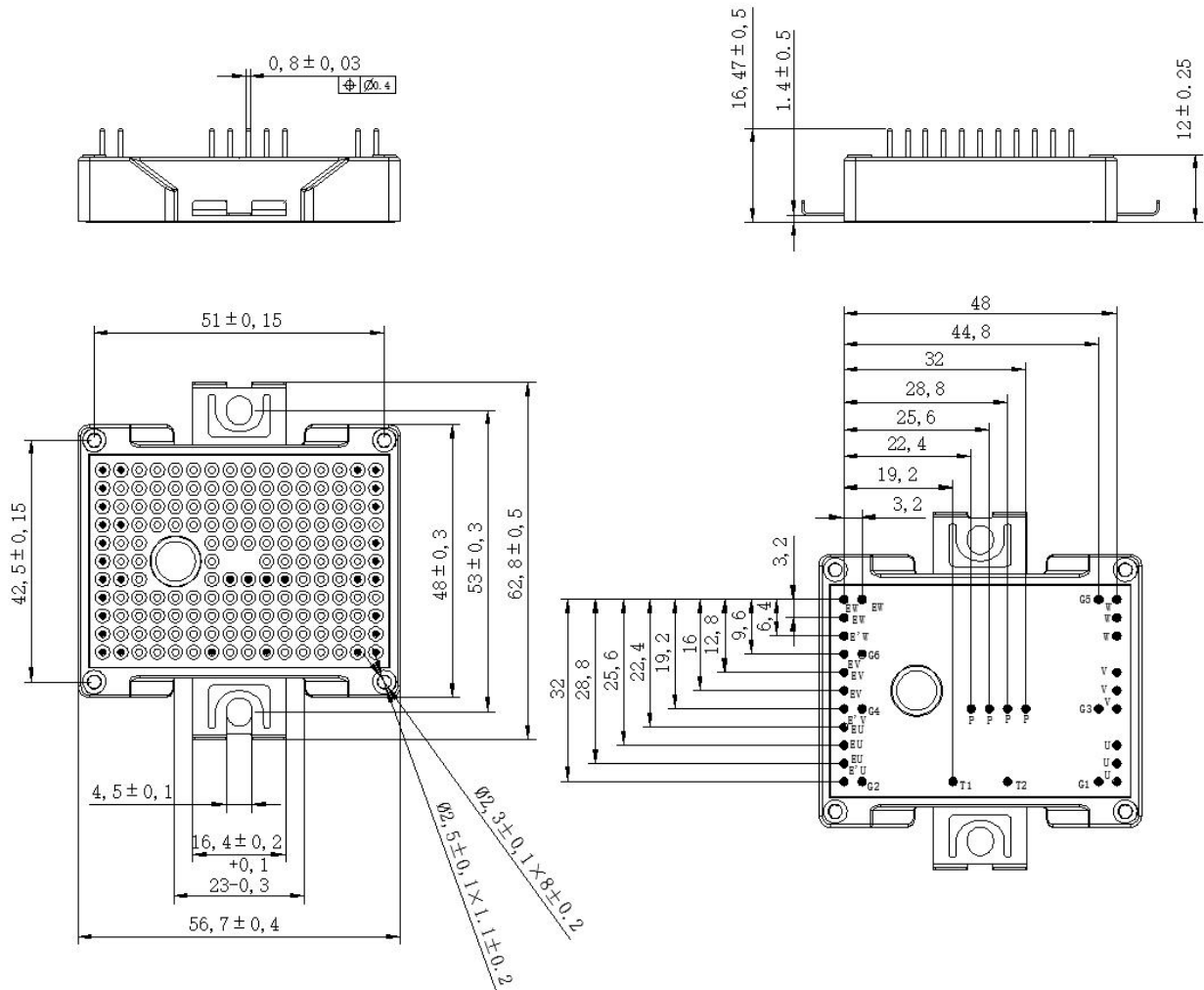
Figure9. transient thermal impedance

Figure10. forward characteristic of Diode(typical)
 $V_{GE}=0V$

Figure11.Reverse Recovery Energy Loss vs. IC
 $V_{cc}=700V, R_{Gon}=25\Omega, R_{Goff}=25\Omega, V_{ge}=\pm 15V$

Figure12.Reverse Recovery Energy Loss vs. Rg
 $V_{cc}=700V, I_c=50A, V_{ge}=\pm 15V$




CIRCUIT DIAGRAM



PACKAGE DIMENSION





REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2025-05-15	Preview



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