

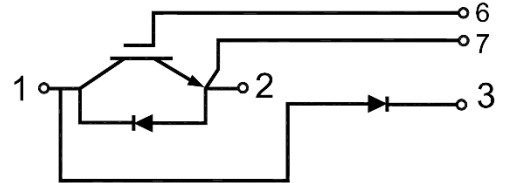


GT75CU120T1VH

IGBT Module

Features:

- Field Stop Trench Gate IGBT
- Short Circuit Rated >10 μ s
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested (2 $\times$ I_c)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications:

- Industrial Inverters
- Servo Applications

IGBT, Brake-Chopper

Maximum Rated Values (T_C=25°C unless otherwise specified)

V _{CES}	Collector-Emitter Blocking Voltage		1200	V
V _{GES}	Gate-Emitter Voltage		±20	V
I _C	Continuous Collector Current	T _C =100°C	75	A
		T _C =25°C	150	A
I _{CM}	Peak Collector Current Repetitive	t _p =1ms	150	A
P _D	Maximum Power Dissipation (IGBT)	T _C =25°C T _{Jmax} =175°C	523	W



Electrical Characteristics of IGBT ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=2.4\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.7	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=75\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$	1.70	2.00	V
			$T_J=125^{\circ}\text{C}$	2.10		V
			$T_J=150^{\circ}\text{C}$	2.20		V
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0\text{V}$, $V_{CE}=V_{CES}$, $T_J=25^{\circ}\text{C}$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=\pm 20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^{\circ}\text{C}$			± 200	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		7.97		nF
C_{oes}	Output Capacitance			1.22		nF
C_{res}	Reveres Transfer Capacitance			0.54		nF

Switching Characteristics

t _{d(on)}	Turn-on Delay Time	V _{CC} =600V, I _C =75A, R _{Gon} =2Ω, V _{GE} =±15V, Inductive Load	T _J =25℃		128		ns
			T _J =125℃		170		
			T _J =150℃		174		
t _r	Rise Time		T _J =25℃		30		ns
			T _J =125℃		36		
			T _J =150℃		36		
t _{d(off)}	Turn-off Delay Time	V _{CC} =600V, I _C =75A, R _{Goff} =2Ω, V _{GE} =±15V, Inductive Load	T _J =25℃		256		ns
			T _J =125℃		376		
			T _J =150℃		384		
t _f	Fall Time		T _J =25℃		158		ns
			T _J =125℃		244		
			T _J =150℃		256		
E _{on}	Turn-on Switching Loss	V _{CC} =600V, I _C =75A, R _{Gon} =2Ω, V _{GE} =±15V, di/dt=1801A/μs(T _J =150℃), Inductive Load	T _J =25℃		2.40		mJ
			T _J =125℃		4.38		
			T _J =150℃		4.77		



E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =75A, R _{Goff} =2Ω, V _{GE} =±15V, du/dt=4370V/μs(T _J =150°C), Inductive Load	T _J =25°C		5.29		mJ
			T _J =125°C		8.27		
			T _J =150°C		8.70		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		2907		nC
R _{g internal}	Internal Gate Resistor		T _J =25°C		6.7		Ω
SCSOA	V _{CC} =600V, V _{GE} =+/-15V, R _{Gon} =2Ω, R _{Goff} =2Ω, T _J =25°C			10			μs
R _{θJC}	Thermal Resistance: Junction-To-Case (per IGBT)					0.287	°C/W

Diode, Brake-Chopper

Maximum Rated Values of Diode (T_C=25°C unless otherwise specified)

V _{RRM}	Repetitive Peak Reverse Voltage	1200	V
I _F	Diode Continuous Forward Current	75	A
I _{FM}	Peak FWD Current Repetitive	150	A

Electrical Characteristics of FWD (T_C=25°C unless otherwise specified)

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =75A	T _J =25°C		1.75		V
			T _J =125°C		1.85		
			T _J =150°C		1.80		
t _{rr}	Reverse Recovery Time	I _F =75A, -diF/dt=1847A/μs(T _J =150°C), V _R =600V, V _{GE} =-15V	T _J =25°C		122		ns
			T _J =125°C		178		
			T _J =150°C		186		
I _{rr}	Peak Reverse Recovery Current		T _J =25°C		99		A
			T _J =125°C		140		
			T _J =150°C		143		
Q _{rr}	Reverse Recovery Charge		T _J =25°C		6.6		μC
			T _J =125°C		13.5		
			T _J =150°C		14.5		



E _{rec}	Reverse Recovery Energy	I _F =75A, -diF/dt=1847A/μs(T _J =150°C), V _R =600V, V _{GE} =-15V	T _J =25°C		2.85		mJ
			T _J =125°C		5.73		
			T _J =150°C		6.22		
R _{θJC}	Thermal Resistance: Junction-To-Case (per Diode)					0.411	°C/W

Diode, Reverse

Maximum Rated Values of Diode (T_C=25°C unless otherwise specified)

V _{RRM}	Repetitive Peak Reverse Voltage	1200	V
I _F	Diode Continuous Forward Current	50	A
I _{FM}	Diode Maximum Forward Current	100	A

Electrical Characteristics of Diode (T_C=25°C unless otherwise specified)

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =50A	T _J =25℃		1.75		V
			T _J =125℃		1.85		
			T _J =150℃		1.80		
t _{rr}	Reverse Recovery Time	I _F =50A, -diF/dt=904A/μs(T _J =150℃), V _R =600V, V _{GE} =-15V	T _J =25℃		290		ns
			T _J =125℃		524		
			T _J =150℃		542		
I _{rr}	Peak Reverse Recovery Current		T _J =25℃		39		A
			T _J =125℃		45		
			T _J =150℃		44		
Q _{rr}	Reverse Recovery Charge		T _J =25℃		5.71		μC
			T _J =125℃		10.25		
			T _J =150℃		11.14		
E _{rec}	Reverse Recovery Energy		T _J =25℃		1.86		mJ
			T _J =125℃		3.83		
			T _J =150℃		4.09		
R _{θJC}	Thermal Resistance: Junction-to-Case (per Diode)					0.501	℃/W



Module

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 30s	4500			V
T _J	Maximum Junction Temperature				175	°C
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+150	°C
T _{stg}	Storage Temperature		-40		+150	°C
CTI	Comparative Tracking Index		200			
R _{θCS}	Case-To-Sink Thermally (Conductive Grease Applied)				0.07	°C/W
T	Power Terminals Screw:M5		3.0		5.0	N·m
T	Mounting Screw:M6		3.0		6.0	N·m
G	Weight			150		g

Ordering Information Table

Device code	G	T	75	CU	120	T1V	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Trench, Low Switching Losses IGBT
- ③ - Rated Current (75=75A)
- ④ - Circuit Configuration: Chopper (Diode on High Side)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

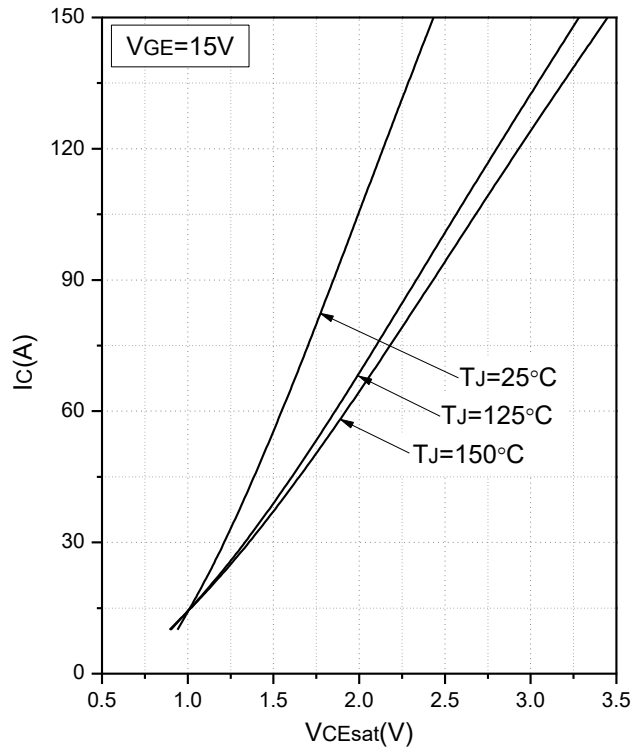


Fig.1 Typical Saturation Voltage Characteristics

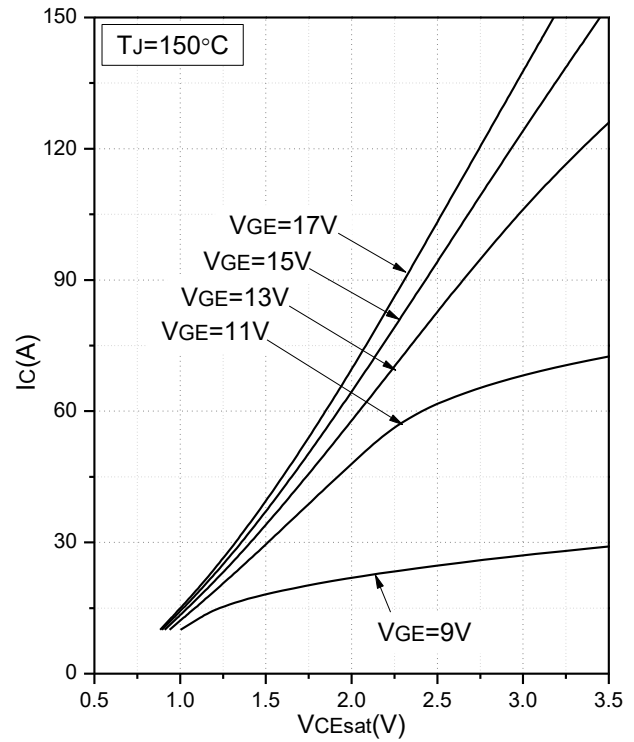


Fig.2 Typical Output Characteristics

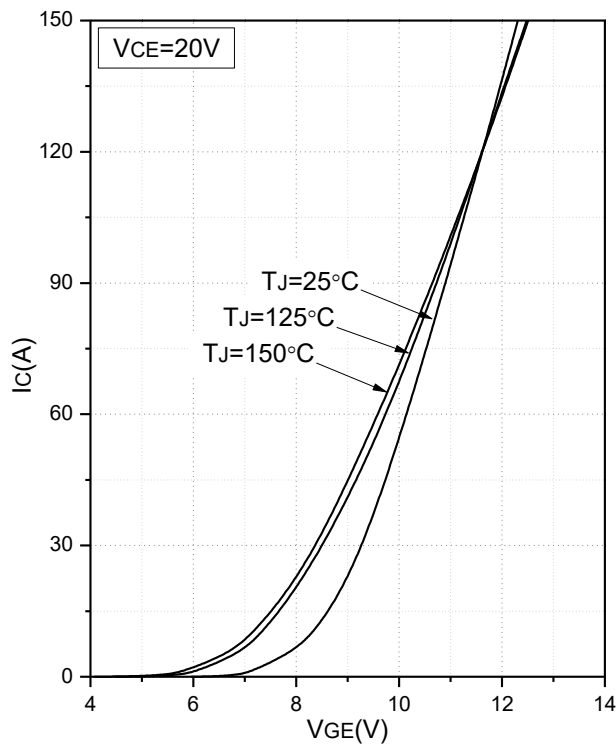


Fig.3 Transfer Characteristics

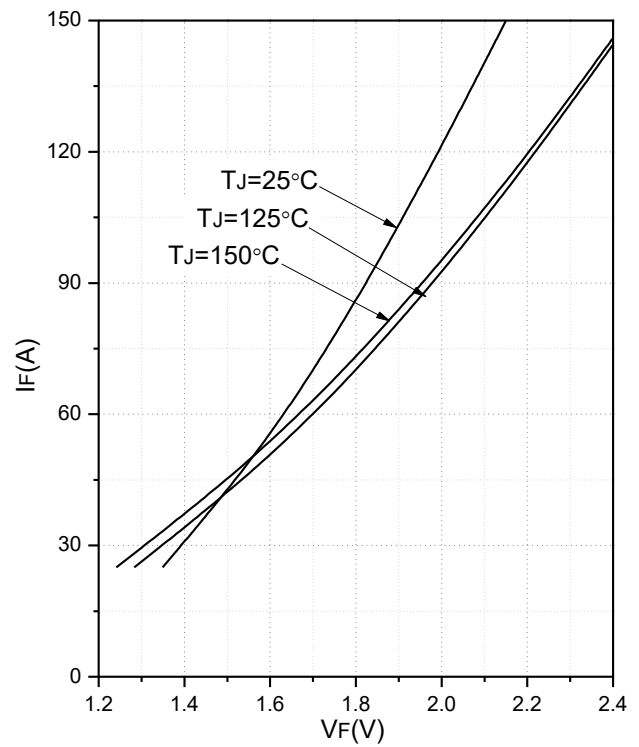


Fig.4 Forward Characteristics of Diode

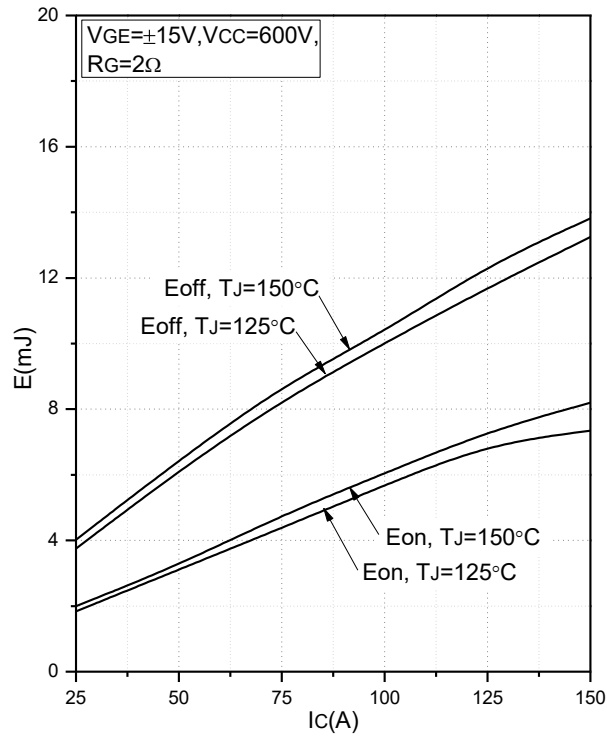


Fig.5 Typical Switching Loss vs. Collector Current

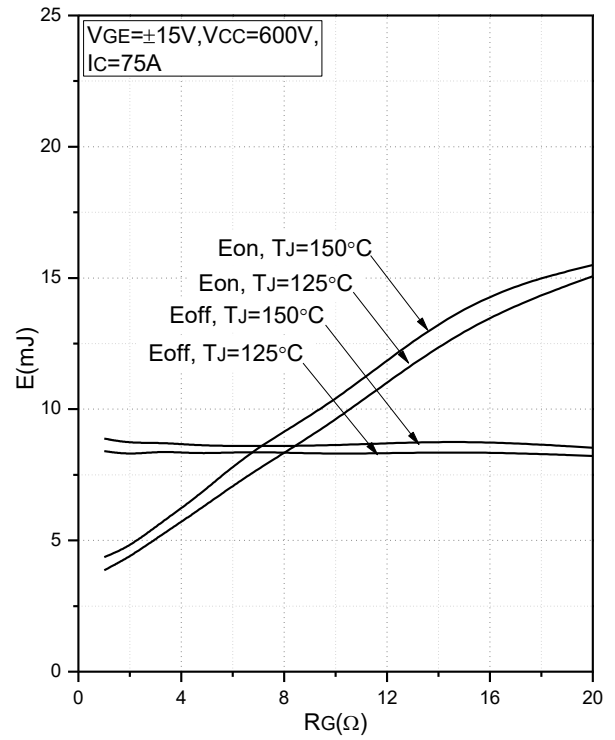


Fig.6 Typical Switching Loss vs. Gate Resistance

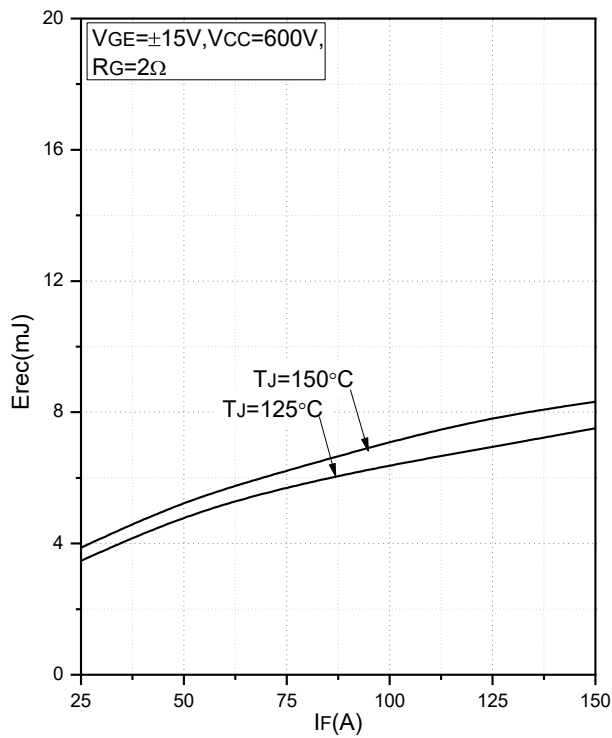


Fig.7 Typical Switching Loss vs. Forward Current

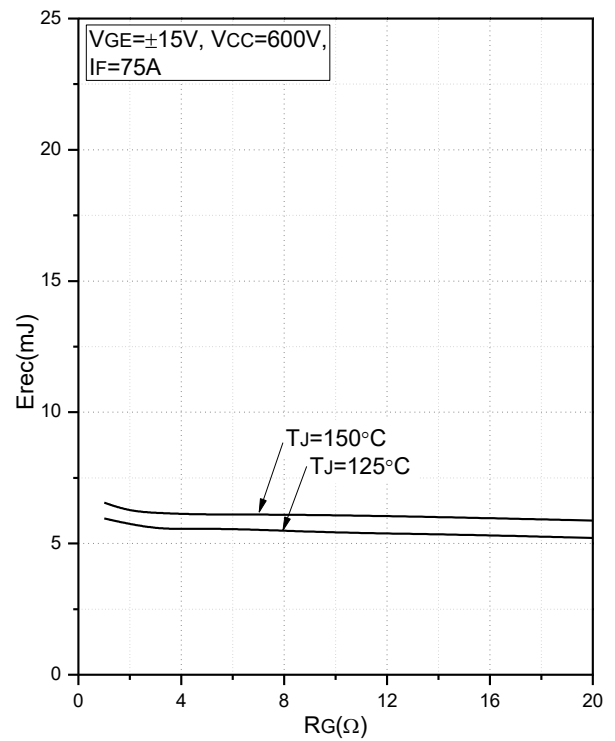
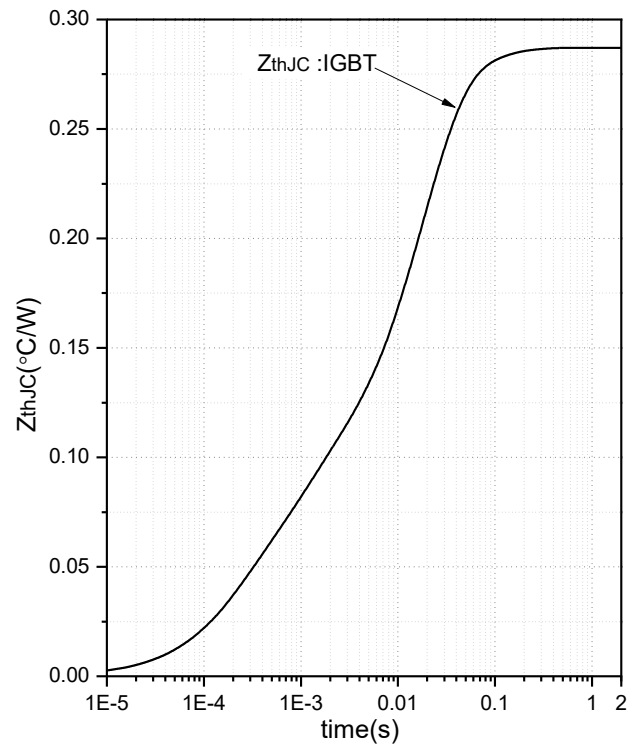
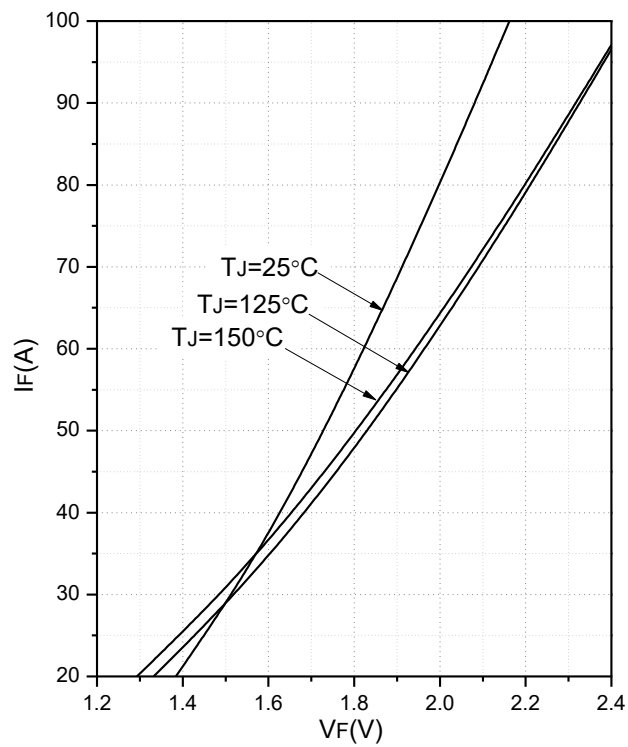
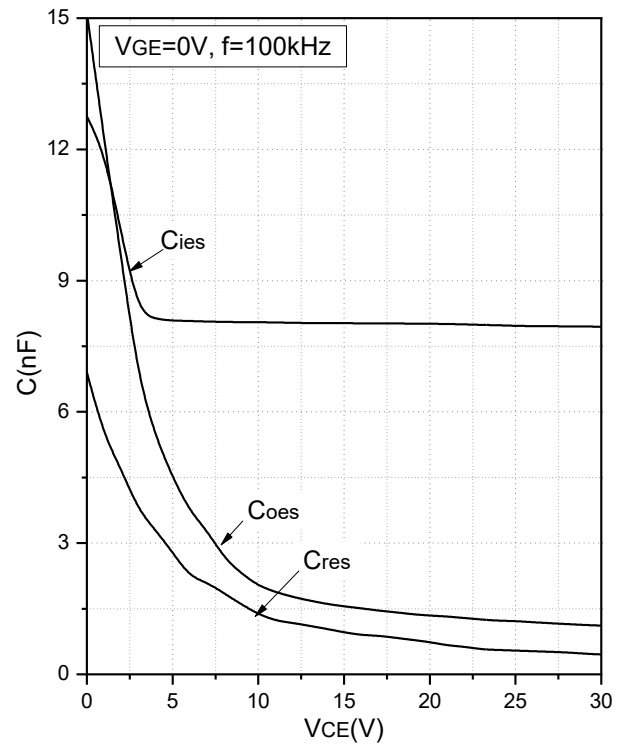
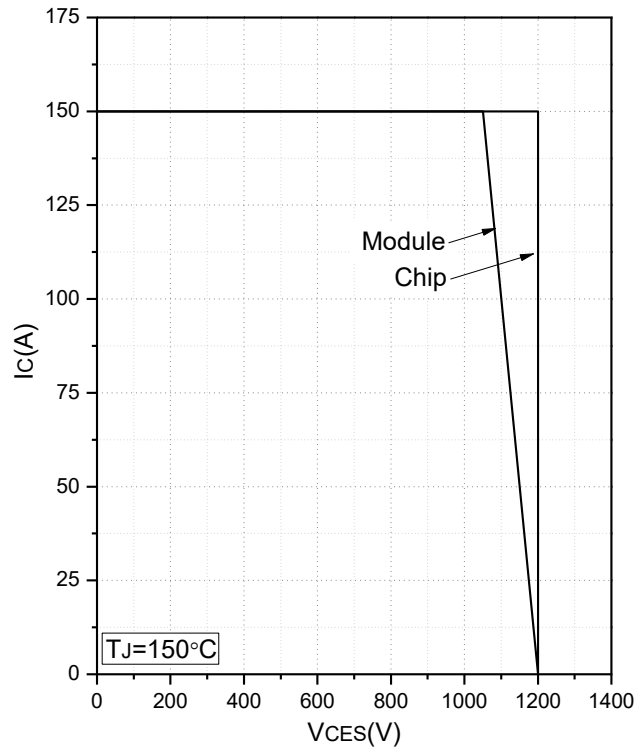


Fig.8 Typical Switching Loss vs. Gate Resistance



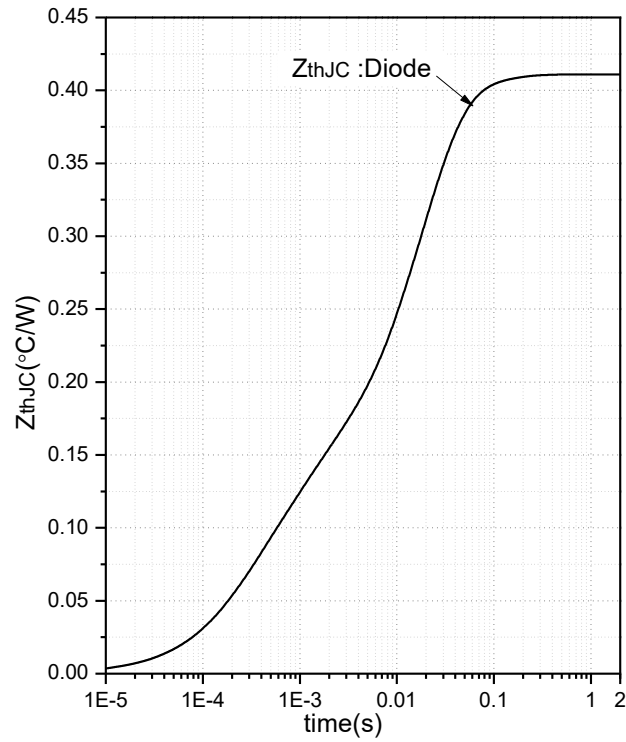


Fig.13 Transient Thermal Impedance (Chopper-Diode)

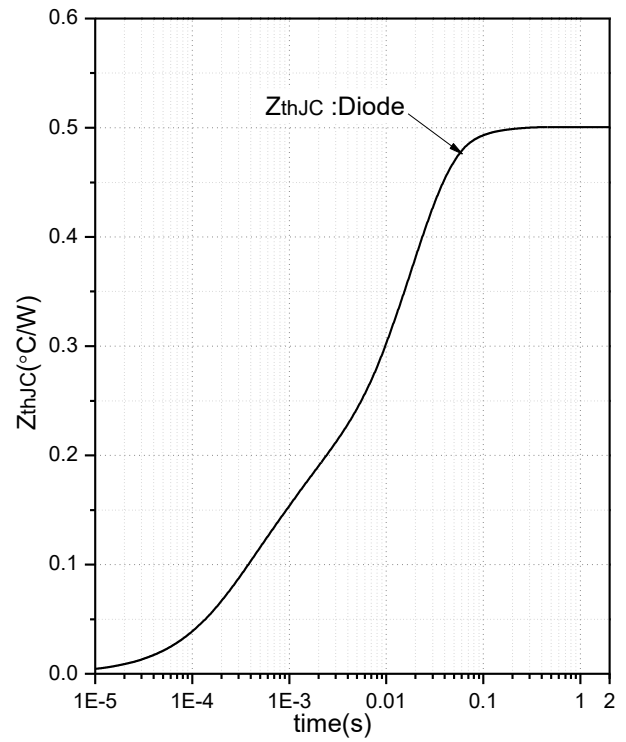
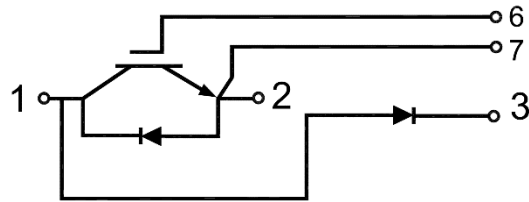


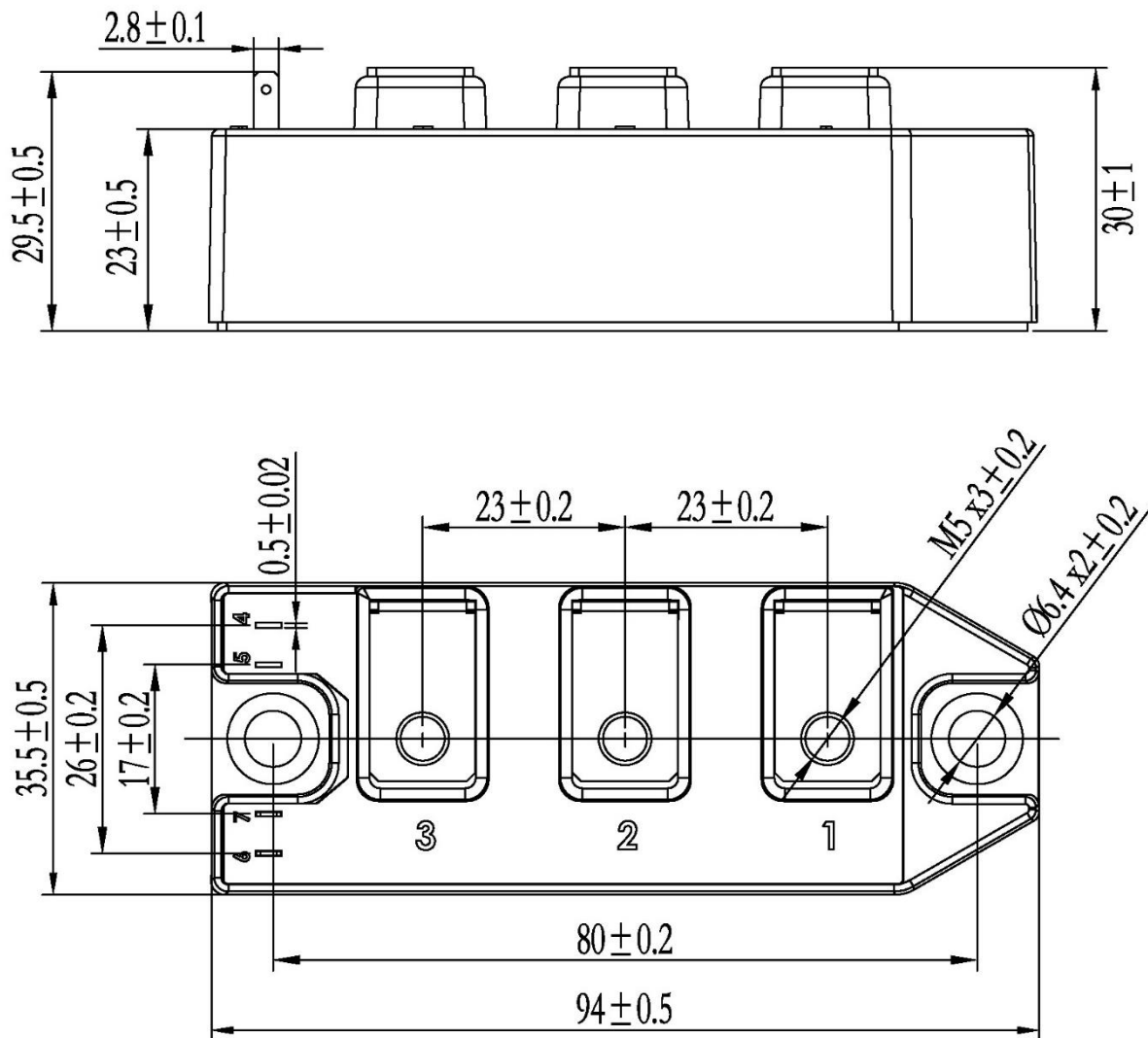
Fig.14 Transient Thermal Impedance (Reverse-Diode)



Internal Circuit:



Package Outline (Unit: mm):





Date	Revision	Notes
04/09/2024	A	Final Version

Announcement

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