



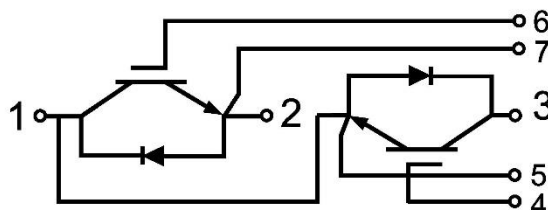
GF75HF120T1VH

IGBT Module

Features:

- Non Punch Through (NPT) Technology
- Short Circuit Rated $>10\mu\text{s}$
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested($2\times I_c$)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Circuit Diagram



Applications:

- Welding Machine、Cutting Machine
- Plating Power Supply、Induction Heating
- SMPS、UPS

IGBT, Inverter

Maximum Rated Values of IGBT ($T_c=25^\circ\text{C}$ unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		± 20	V
I_c	Continuous Collector Current	$T_c=80^\circ\text{C}$	75	A
		$T_c=25^\circ\text{C}$	140	A
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	150	A
P_D	Maximum Power Dissipation per leg	$T_c=25^\circ\text{C}$ $T_{Jmax}=150^\circ\text{C}$	736	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	$I_C=1\text{mA}$, $V_{CE}=V_{GE}$	4.5	5.4	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=75\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$	2.55	3.10	V
			$T_J=125^{\circ}\text{C}$	3.20		
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	$V_{GE}=20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^{\circ}\text{C}$			200	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		6510		pF
C_{oes}	Output Capacitance			580		
C_{res}	Reverse Transfer Capacitance			290		

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=75A,$ $R_{Gon}=15\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		422		ns
			$T_J=125^{\circ}C$		435		
t_r	Rise Time		$T_J=25^{\circ}C$		74		ns
			$T_J=125^{\circ}C$		81		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=600V, I_C=75A,$ $R_{Goff}=15\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		421		ns
			$T_J=125^{\circ}C$		461		
t_f	Fall Time		$T_J=25^{\circ}C$		153		ns
			$T_J=125^{\circ}C$		175		
E_{on}	Turn-on Switching Loss	$V_{CC}=600V, I_C=75A,$ $R_{Gon}=15\Omega, V_{GE}=\pm 15V,$ $di/dt=800A/\mu s(T_J=125^{\circ}C),$ Inductive Load	$T_J=25^{\circ}C$		6.00		mJ
			$T_J=125^{\circ}C$		6.25		
E_{off}	Turn-off Switching Loss	$V_{CC}=600V, I_C=75A,$ $R_{Goff}=15\Omega, V_{GE}=\pm 15V,$ $du/dt=5122V/\mu s(T_J=125^{\circ}C),$ Inductive Load	$T_J=25^{\circ}C$		2.82		mJ
			$T_J=125^{\circ}C$		3.76		
Q_g	Total Gate Charge	$V_{GE}=+15V \dots -15V$	$T_J=25^{\circ}C$		891		nC
$R_{G(int)}$	Internal Gate Resistance		$T_J=25^{\circ}C$		0		Ω
SCSOA	$V_{CC}=600V, V_{GE}=\pm 15V, T_J=125^{\circ}C$			10			us
$R_{\theta JC}$	Thermal Resistance: Junction-to-Case (per IGBT)					0.17	$^{\circ}C/W$



FWD, Inverter

Maximum Rated Values of Diode ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	$T_J=25^{\circ}\text{C}$	1200	V
I_F	Diode Continuous Forward Current		75	A
I_{FM}	Diode Maximum Forward Current	$t_p=1\text{ms}$	150	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =75A	T _J =25°C		3.60		V
			T _J =125°C		3.80		
t _{rr}	Reverse Recovery Time	I _F =75A, -diF/dt=1006A/μs(T _J =125°C), V _{rr} =600V, V _{GE} =-15V	T _J =25°C		110		ns
			T _J =125°C		140		
I _{rr}	Peak Reverse Recovery Current		T _J =25°C		33.7	A	
			T _J =125°C		43.7		
Q _{rr}	Reverse Recovery Charge		T _J =25°C		2.2	μC	
			T _J =125°C		3.7		
E _{rec}	Reverse Recovery Energy		T _J =25°C		0.78		mJ
			T _J =125°C		1.35		
R _{θJC}	Thermal Resistance: Junction-to-Case (per Diode)					0.68	°C/W



Module

Symbol	Description		Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 1minute	2500			V
L _{sCE}	Stray Inductance Module			30		nH
T _J	Maximum Junction Temperature				150	°C
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+150	°C
T _{stg}	Storage Temperature		-40		+125	°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		4.0		6.0	N·m
G	Weight			165		g

Ordering Information Table

Device code	G	F	75	HF	120	T1V	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Non Punch Through (NPT) Technology, Fast IGBT
- ③ - Rated Current (75=75A)
- ④ - Circuit Configuration (Half Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

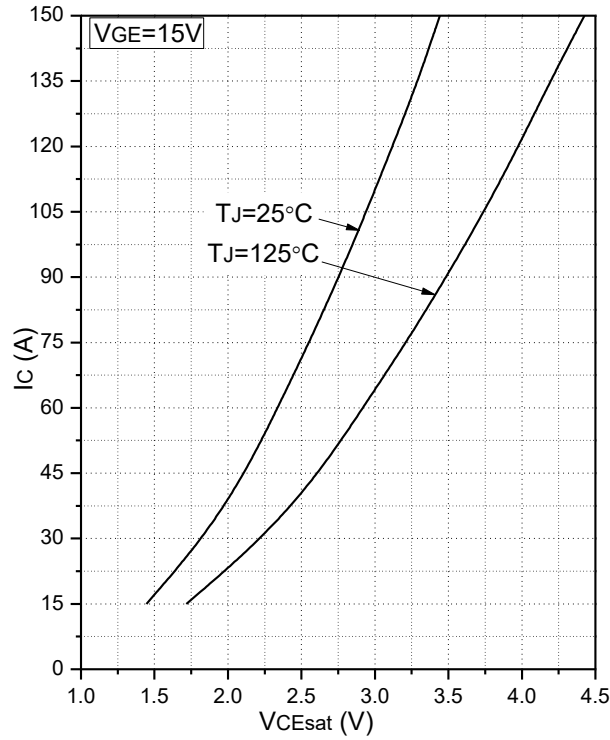


Fig.1 Typical Saturation Voltage Characteristics

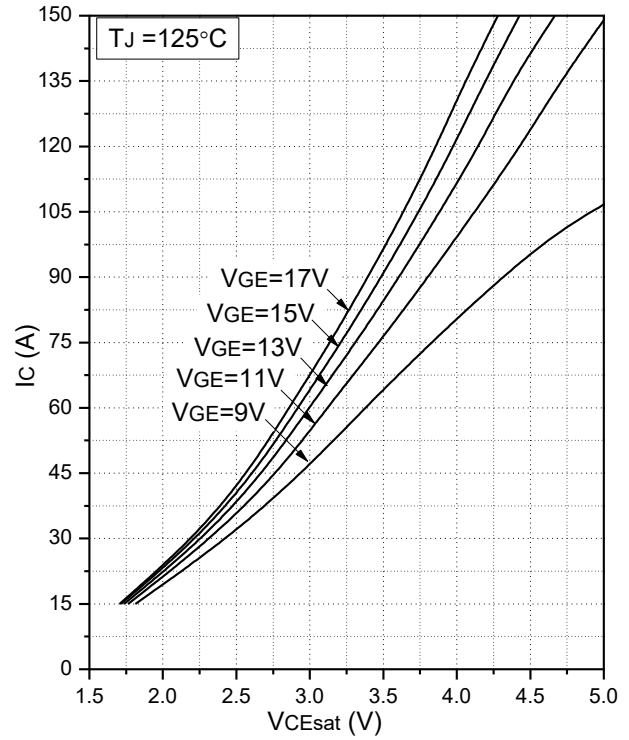


Fig.2 Typical Output Characteristics

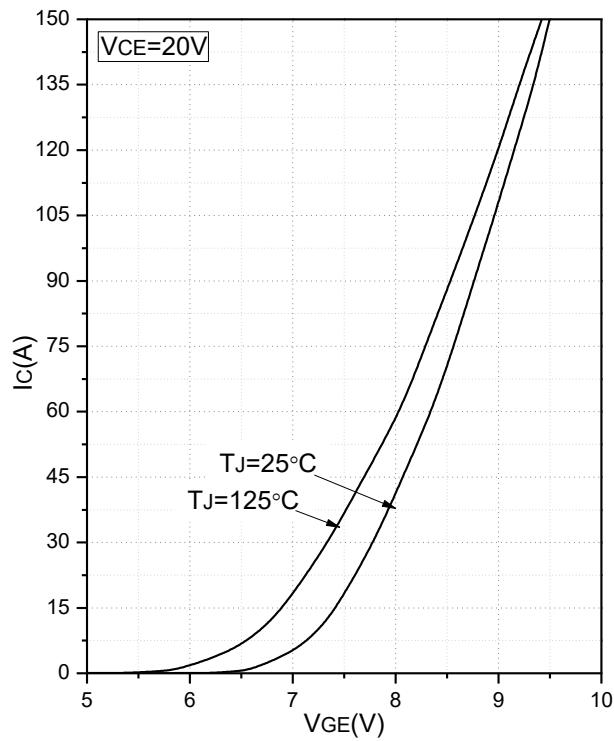


Fig.3 Transfer Characteristics

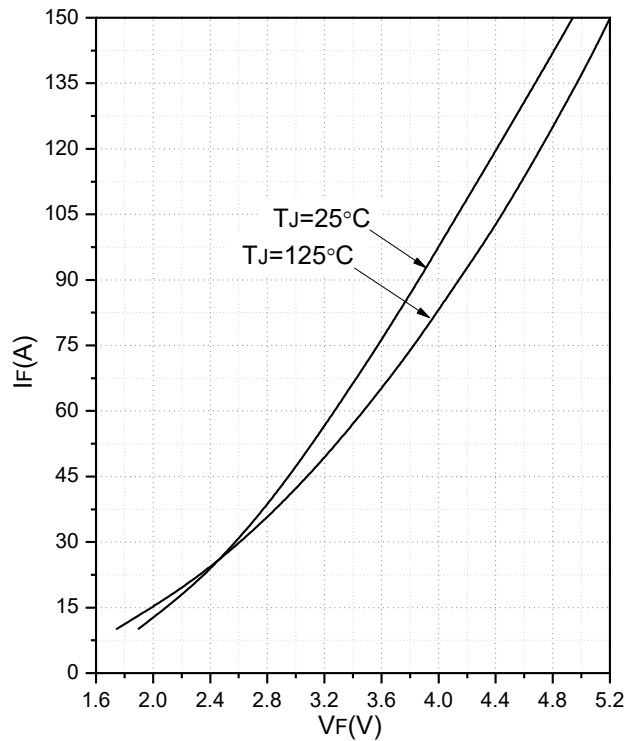
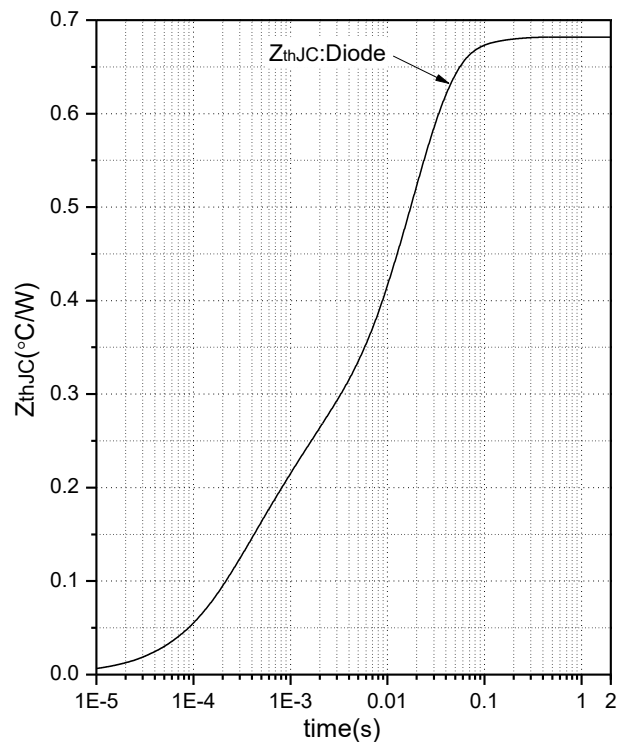
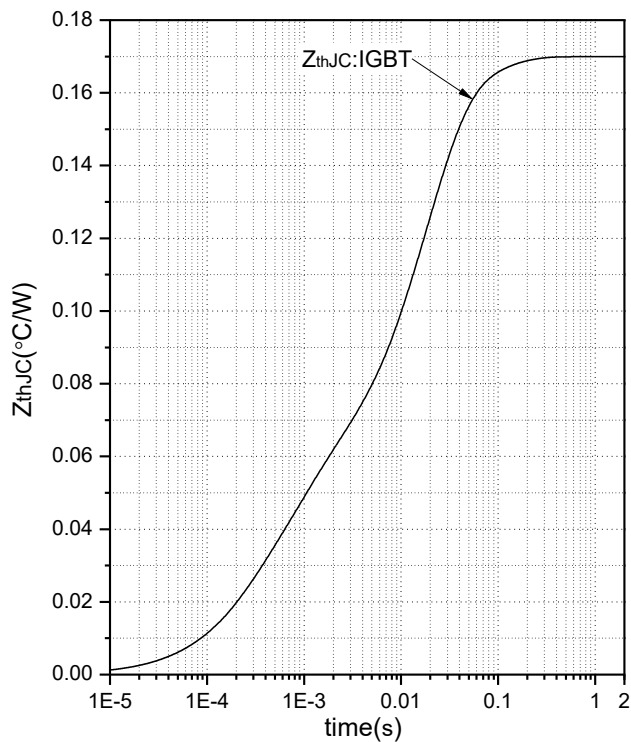
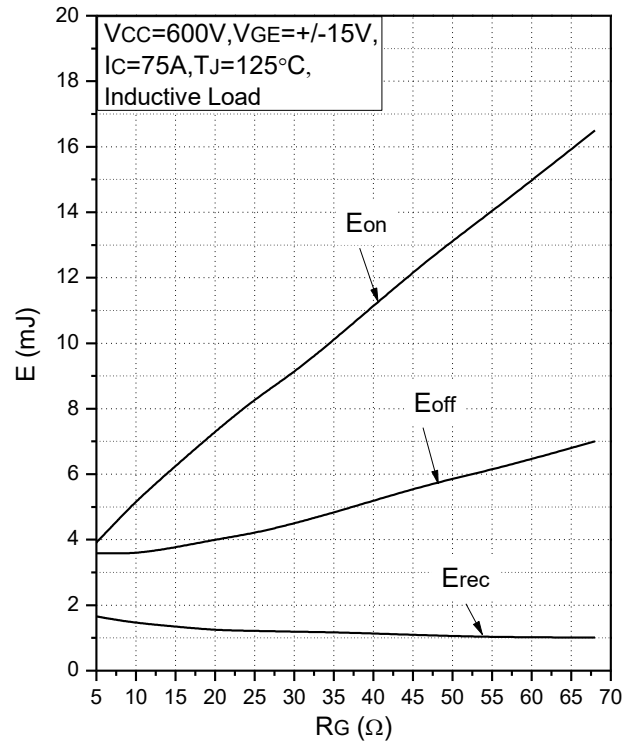
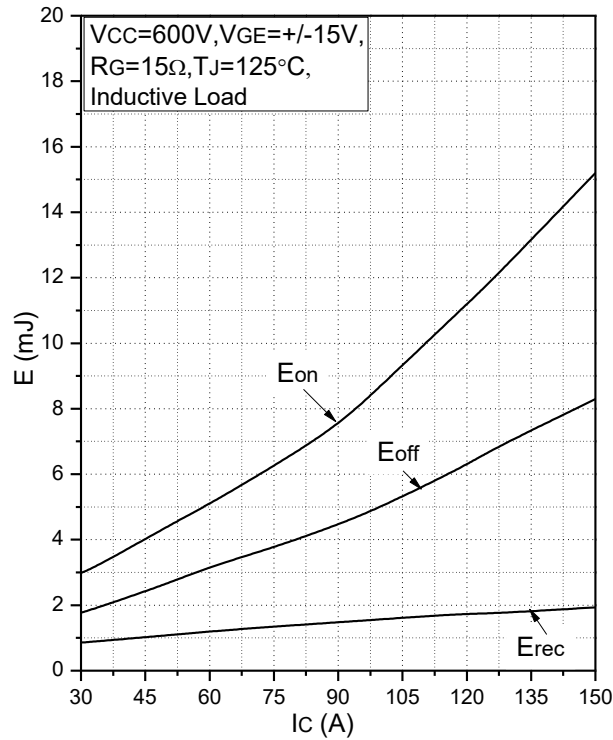


Fig.4 Forward Characteristics of FWD



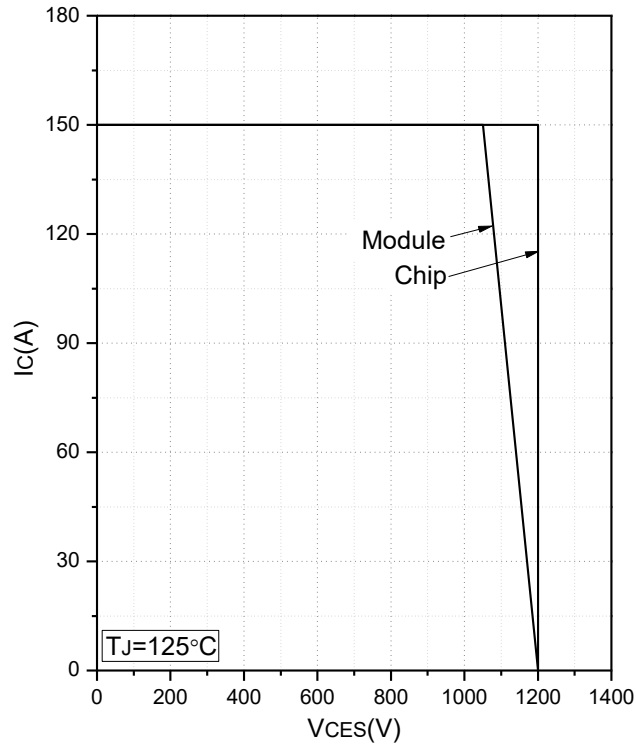


Fig. 9 Reverse Bias Safe Operation Area (RBSOA)

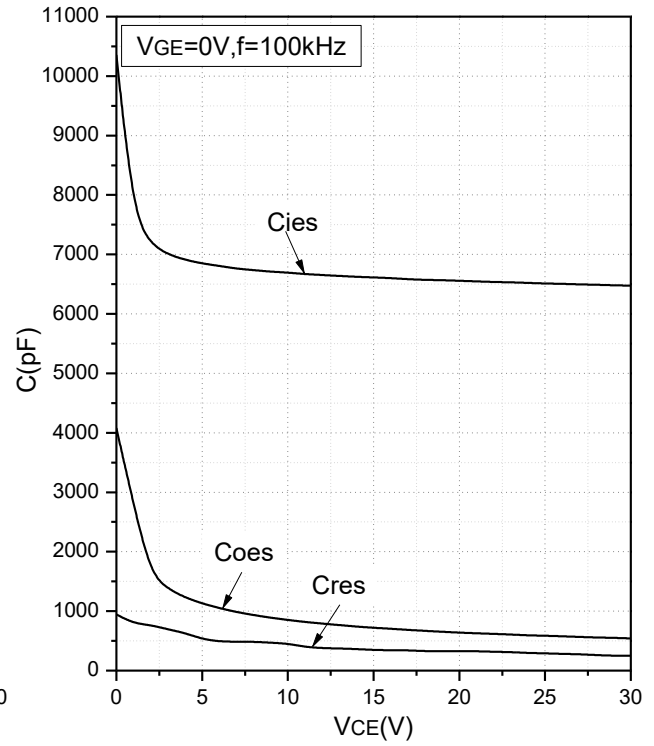
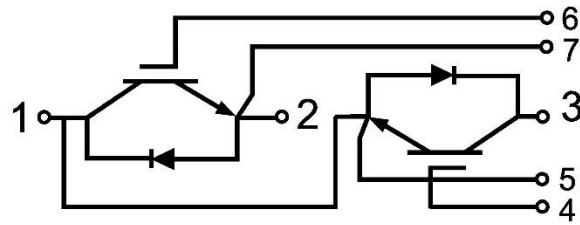


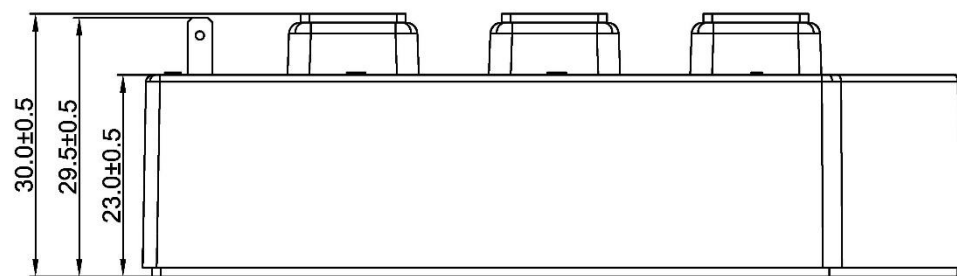
Fig.10 Capacitance Characteristics



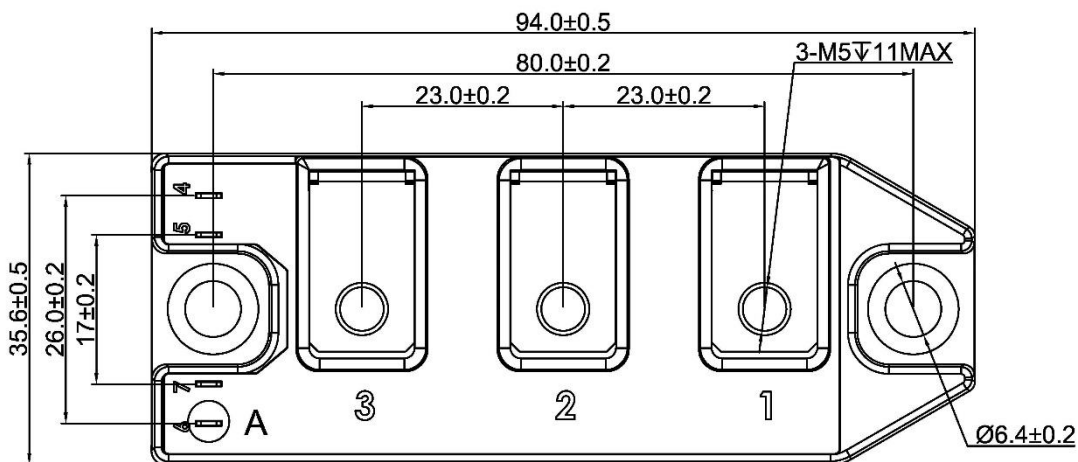
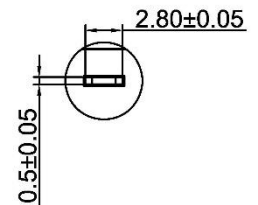
Internal Circuit



Package Outline (Unit: mm):



View A
scale 3:1





Revision	Notes
A	Final Version
B	Added 'Stray Inductance Module'
C	Update Package Outline and Format
D	Updated Electrical Characteristic Parameter Values

Announcements

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