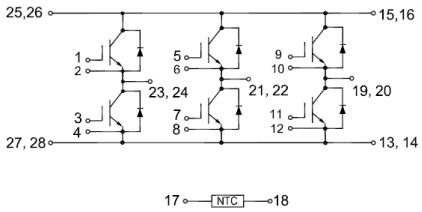
GT75FF120T5H-M

Preliminary Data

IGBT Module

Features：



- Field Stop Trench Gate IGBT
- Short Circuit Rated >10μs
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested(2×Ic)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Applications：

- Industrial Inverters
- Servo Applications

IGBT, Inverter

Maximum Rated Values(T_C = 25℃ 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℃	75	A
		T_C = 25℃	150	A
I_{CM}	Peak Collector Current Repetitive	T_J = 175℃	150	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation (IGBT)	T_C = 25℃ T_{Jmax}=175℃	540	W

Electrical Characteristics of IGBT (T_C = 25℃ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions		Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C = 2.6 mA, V_{CE} = V_{GE}		5.0	5.5	6.8	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C =75A, V_{GE} = 15V	T_J = 25℃		1.60		V
			T_J = 125℃		1.80		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE} = 0V, V_{CE} = V_{CES}, T_J = 25℃				1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE} = ±20V, V_{CE} = 0V, T_J = 25℃				200	nA
C_{ies}	Input Capacitance	V_{CE} = 25V, V_{GE} = 0V , f =1MHz			5.62		nF
C_{oes}	Output Capacitance				0.49		nF
C_{res}	Reverse Transfer Capacitance				0.38		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℃		158		ns
			T_J=125℃		163		
t_r	Rise Time		T_J=25℃		49		ns
			T_J=125℃		53		
$t_{d(off)}$	Turn-off Delay Time	V_{CC} = 600V,I_C =75A, R_{Goff} =2Ω,V_{GE} = ±15V, Inductive Load	T_J=25℃		193		ns
			T_J=125℃		211		
t_f	Fall Time		T_J=25℃		203		ns
			T_J=125℃		370		
E_{on}	Turn-on Switching Loss	V_{CC} = 600V,I_C =75A, R_{Gon} =2Ω,V_{GE} = ±15V, di/dt=1203A/μs(T_J=125℃), Inductive Load	T_J=25℃		3.22		mJ
			T_J=125℃		4.35		
E_{off}	Turn-off Switching Loss	V_{CC} = 600V,I_C =75A, R_{Goff} =2Ω,V_{GE} = ±15V, du/dt=4109A/μs(T_J=125℃), Inductive Load	T_J=25℃		3.40		mJ
			T_J=125℃		5.91		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		374		nC
R_{gint}	Internal Gate Resistor		T_J=25℃		10		Ω
RBSOA	Reverse Bias Safe Operation Area	I_C=150A,V_{CC}=1050V,Vp=1200V, R_{Goff} = 2Ω, V_{GE}=+15V to 0V, T_J =150°C		Trapezoid			
SC Data	Vcc=800V, tp=10us, Vge=+/-15V ,R_{Gon}=10ohm, R_{Goff}=10ohm,Tj=25℃				469		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case					0.277	℃/W

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

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	75	A
I_{FM}	Diode Maximum Forward Current	150	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F =75A	T_J=25℃		2.10		V
			T_J=125℃		2.20		
t_{rr}	Reverse Recovery Time	I_F=75A, -di$_F$/dt =1738A/μs(T_J=125℃), V_R = 600V, V_{GE} = -15V	T_J=25℃		204		ns
			T_J=125℃		388		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		47		A
			T_J=125℃		64		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		4.56		μC
			T_J=125℃		9.42		
E_{rec}	Reverse Recovery Energy		T_J=25℃		1.67		mJ
			T_J=125℃		3.60		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case					0.425	℃/W

Internal NTC-Thermistor Characteristics

Symbol	Description		Min.	Typ.	Max.	Units.
R_{25}	Rated Resistance	T_C=25℃		5		kΩ
△R/R	Deviation of R100	T_C=100℃，R_{100}=481Ω	-5		5	%
P_{25}	Power Dissipation	T_C=25℃			10	mW
$B_{25/50}$	B-Value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$		3380		K
$B_{25/80}$	B-Value	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298.15K))]$		3440		K

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted)	RMS, f=50Hz, 1minute	2500			V
L_{sCE}	Stray Inductance Module			19		nH
T_J	Maximum Junction Temperature				175	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+125	℃
CTI	Comparative Tracking Index		200			
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)				0.03	℃/W
M	Mounting Torque for Module Mounting	Screw M5--Mounting according to valid application note	3.0		5.0	N·m
G	Weight			190		g

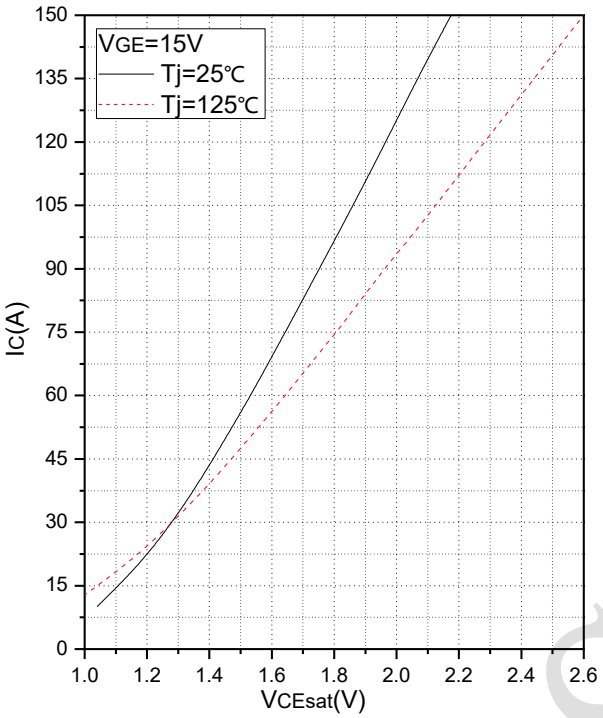


Fig.1 Typical Saturation Voltage Characteristics

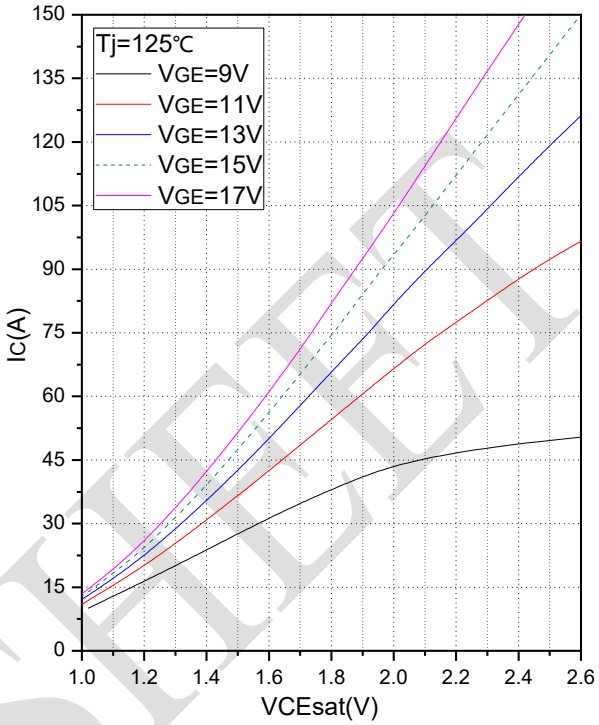


Fig.2 Typical Output Characteristics

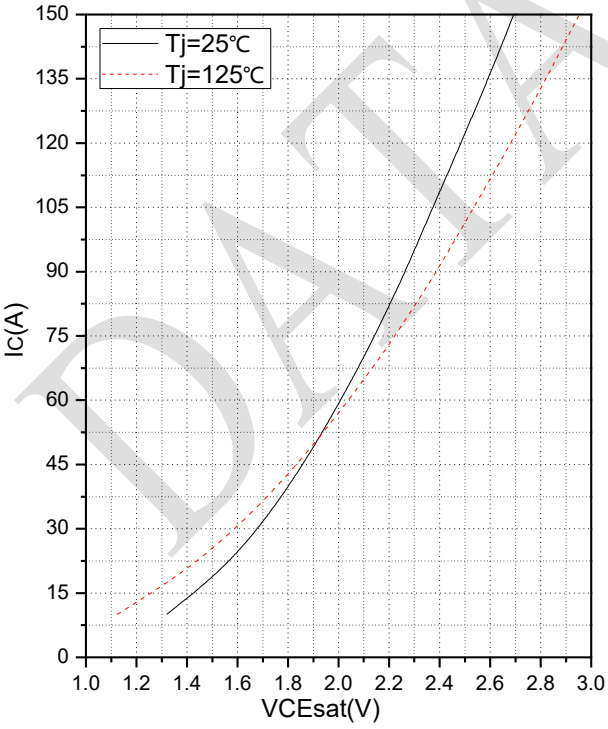


Fig.3 Forward Characteristics of Diode

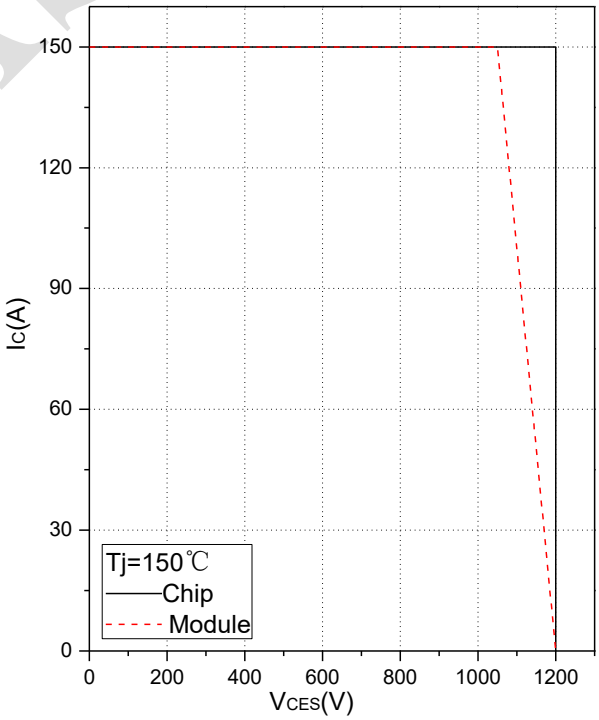


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

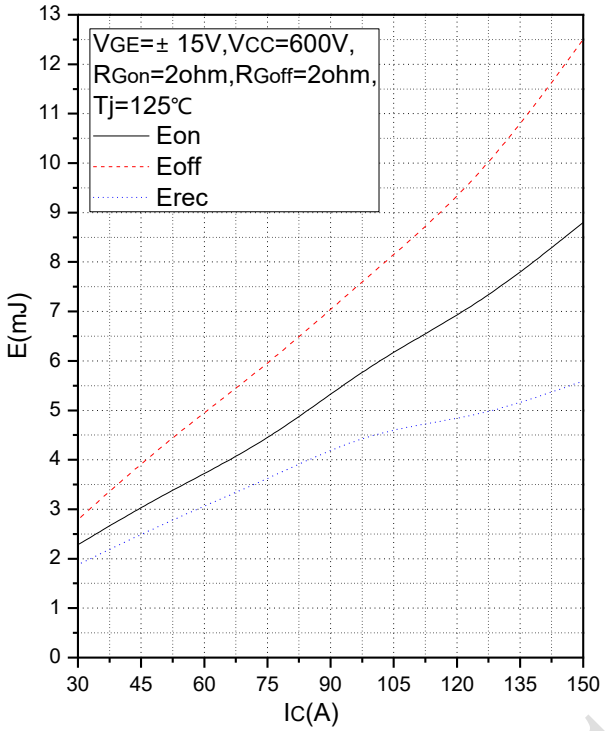


Fig.5 Typical Switching Loss vs. Collector Current

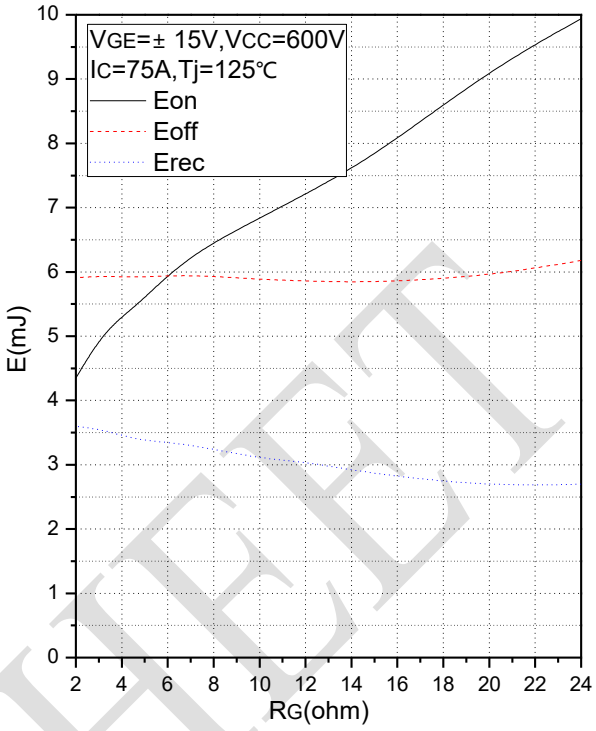


Fig.6 Typical Switching Loss vs. Gate Resistance

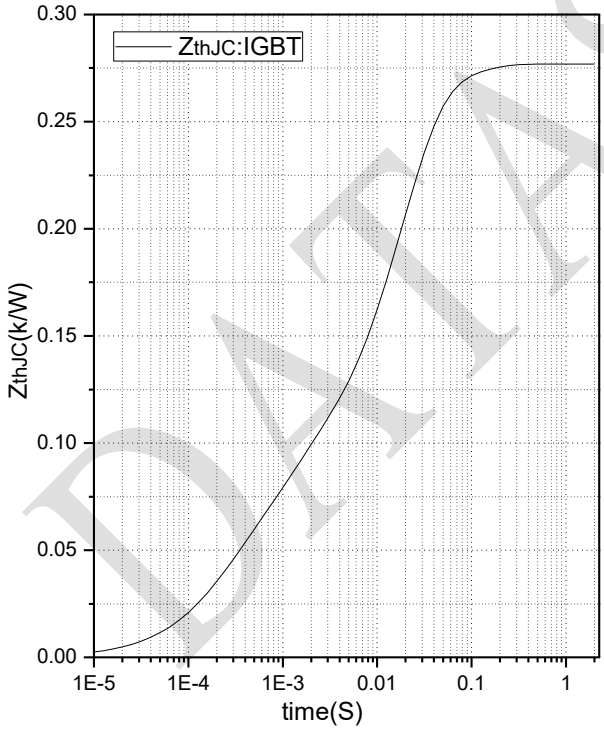


Fig.7 Transient Thermal Impedance (IGBT)

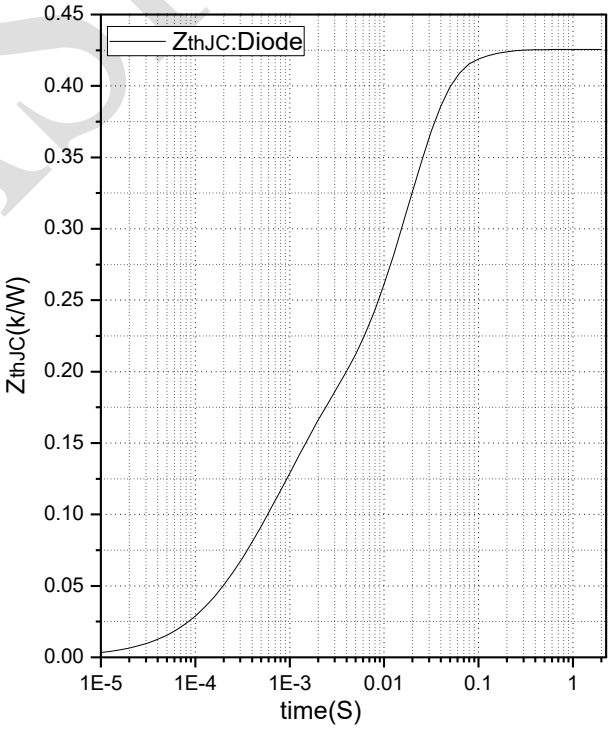


Fig.8 Transient Thermal Impedance (Diode)

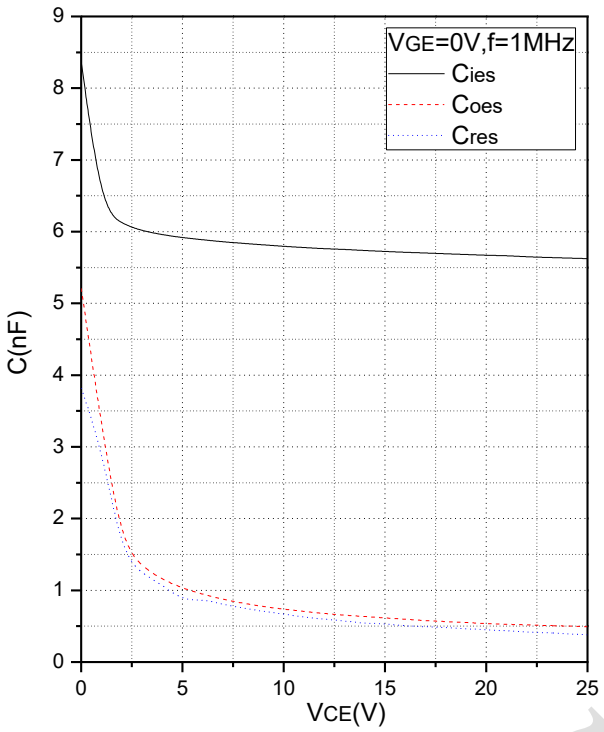


Fig.9 Capacitance Characteristics

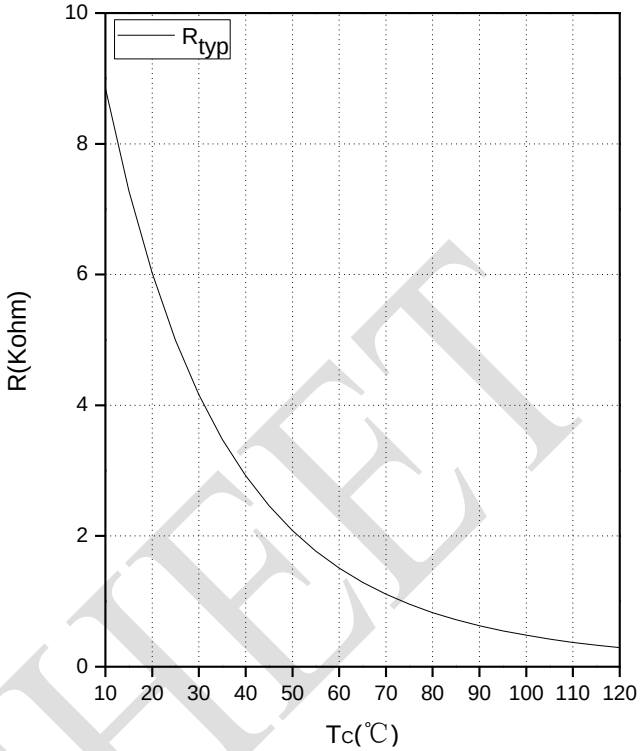
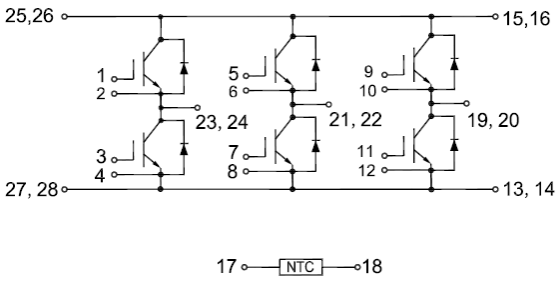
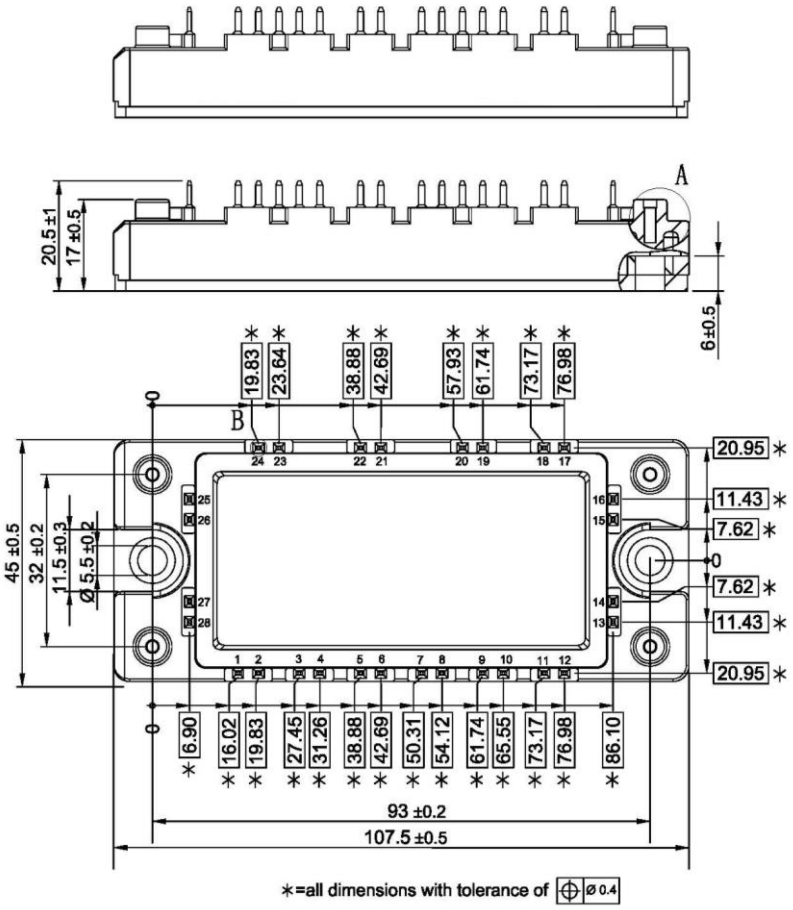


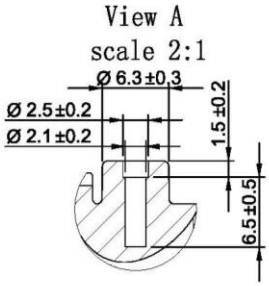
Fig.10 NTC Temperature Characteristics

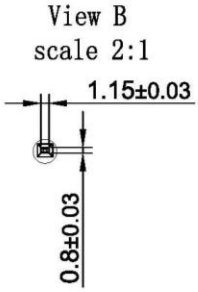
Internal Circuit:



Package Outline (Unit: mm):







Date	Revision	Notes
11/28/2018	01	Initial Release

Announcement

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