

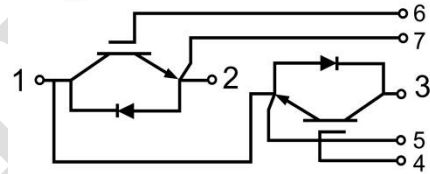


GT100HF120T1NH

IGBT Module

Features:

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



Applications:

- Industrial Inverters
- Servo Applications
- EV and EHV
- Induction Heating

Maximum Rated Values of IGBT(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	100	A
		T _C =25°C	185	A
I _{CM}	Repetitive Peak Collector Current	T _J =175°C	200	A
t _{sc}	Short Circuit Withstand Time		>10	μs
P _D	Maximum Power Dissipation per leg	T _C =25°C T _{Jmax} =175°C	720	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	$I_C=4\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=100\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	2.00	2.20	V
			$T_J=125^\circ\text{C}$	2.40		V
			$T_J=150^\circ\text{C}$	2.50		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	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		8.3		nF
C_{res}	Reverse Transfer Capacitance			0.29		nF

Switching Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units		
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Gon}=4.7\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$		269		ns	
			$T_J=125^\circ\text{C}$		265			
			$T_J=150^\circ\text{C}$		273			
t_r	Rise Time		$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Gon}=4.7\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$		80		ns
				$T_J=125^\circ\text{C}$		83		
				$T_J=150^\circ\text{C}$		94		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Goff}=4.7\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load		$T_J=25^\circ\text{C}$		186		ns
				$T_J=125^\circ\text{C}$		189		
				$T_J=150^\circ\text{C}$		200		
t_f	Fall Time		$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Goff}=4.7\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$		145		ns
				$T_J=125^\circ\text{C}$		185		
				$T_J=150^\circ\text{C}$		193		
E_{on}	Turn-on Switching Loss	$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Gon}=4.7\Omega$, $V_{GE}=\pm 15\text{V}$, $di/dt=940\text{A}/\mu\text{s}(T_J=150^\circ\text{C})$, Inductive Load		$T_J=25^\circ\text{C}$		4.8		mJ
				$T_J=125^\circ\text{C}$		5.9		
				$T_J=150^\circ\text{C}$		7.3		



E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =100A, R _{Goff} =4.7Ω, V _{GE} =±15V, du/dt=6770V/μs(T _J =150°C), Inductive Load	T _J =25°C	4.9	mJ
			T _J =125°C	6.1	
			T _J =150°C	7.0	
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C	0.447	μC
R _{g internal}	Internal Gate Resistance		T _J =25°C	7.5	Ω
RBSOA	Reverse Bias Safe Operation Area	I _C =200A, V _{CC} =1050V, V _p =1200V, R _G =4.7Ω, V _{GE} =+15V to 0V, T _J =150°C	Trapezoid		
SC Data	V _{CC} =600V, t _p =10us, V _{GE} =+/-15V, R _{Gon} =4.7ohm, R _{Goff} =4.7ohm, T _J =150°C		10		μs
R _{θJC}	IGBT Thermal Resistance: Junction-to-Case			0.21	°C/W

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	100	A
I _{FM}	Diode Maximum Forward Current	200	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 =100A	T _J =25°C	2.05		V
			T _J =125°C	2.25		
			T _J =150°C	2.25		
t _{rr}	Reverse Recovery Time	I _F =100A, -diF/dt=1370A/μs(T _J =150°C), V _{rr} =600V, V _{GE} =-15V	T _J =25°C	255		ns
			T _J =125°C	194		
			T _J =150°C	200		
I _{rr}	Peak Reverse Recovery Current	I _F =100A, -diF/dt=1370A/μs(T _J =150°C), V _{rr} =600V, V _{GE} =-15V	T _J =25°C	73		A
			T _J =125°C	78		
			T _J =150°C	80		
Q _{rr}	Reverse Recovery Charge	I _F =100A, -diF/dt=1370A/μs(T _J =150°C), V _{rr} =600V, V _{GE} =-15V	T _J =25°C	8.3		μC
			T _J =125°C	9.6		
			T _J =150°C	11.2		



E _{rec}	Reverse Recovery Energy	I _F =100A -diF/dt=1370A/μs(T _J =150°C), V _{rr} =600V, V _{GE} =-15V	T _J =25°C	3.7	mJ
			T _J =125°C	5.2	
			T _J =150°C	6.6	
R _{θJC}	Diode Thermal Resistance: Junction-to-Case			0.41	°C/W

Module

Symbol	Description	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	f =50Hz, 1minute	2500		V
T _J	Maximum Junction Temperature			175	°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			150	g

Ordering Information Table

Device code

G	T	100	HF	120	T1N	H
①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Trench, Low Switching Losses IGBT
- ③ - Rated Current (100=100A)
- ④ - Circuit Configuration (Half Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

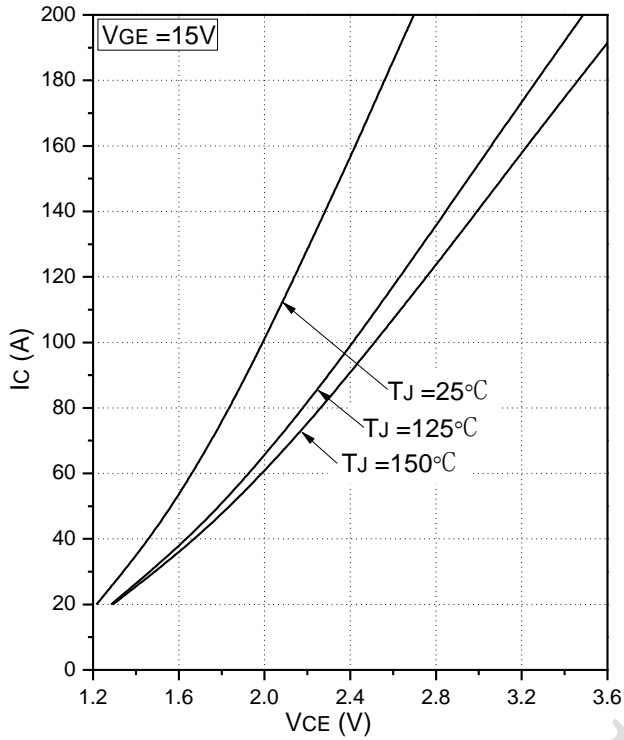


Fig.1 Typical Saturation Voltage Characteristics

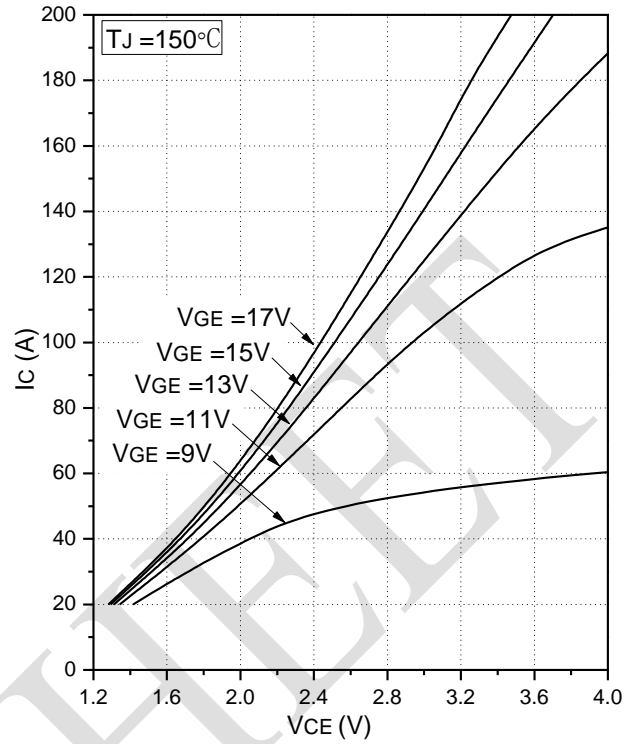


Fig.2 Typical Output Characteristics

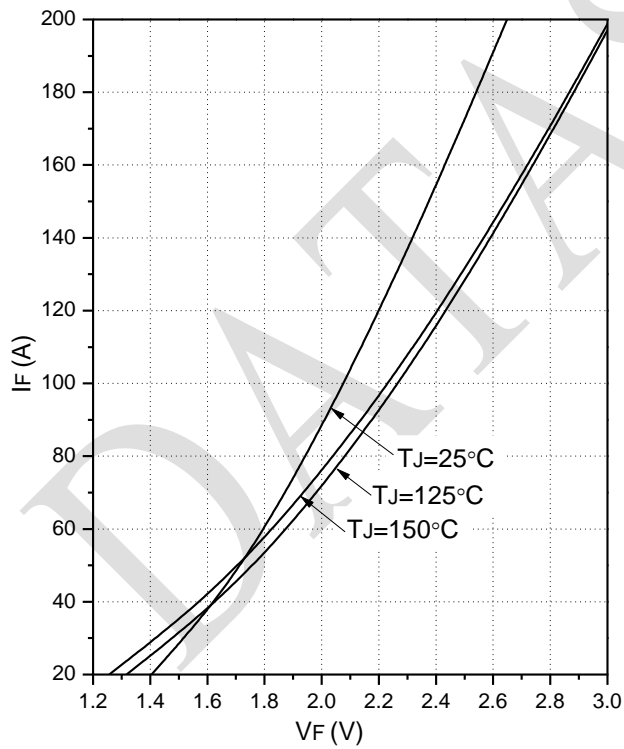


Fig.3 Forward Characteristics of Diode

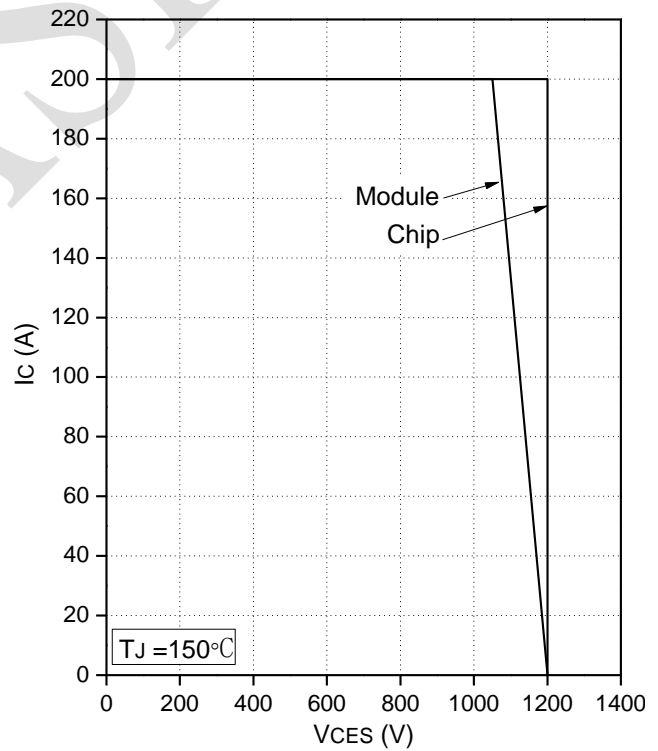


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

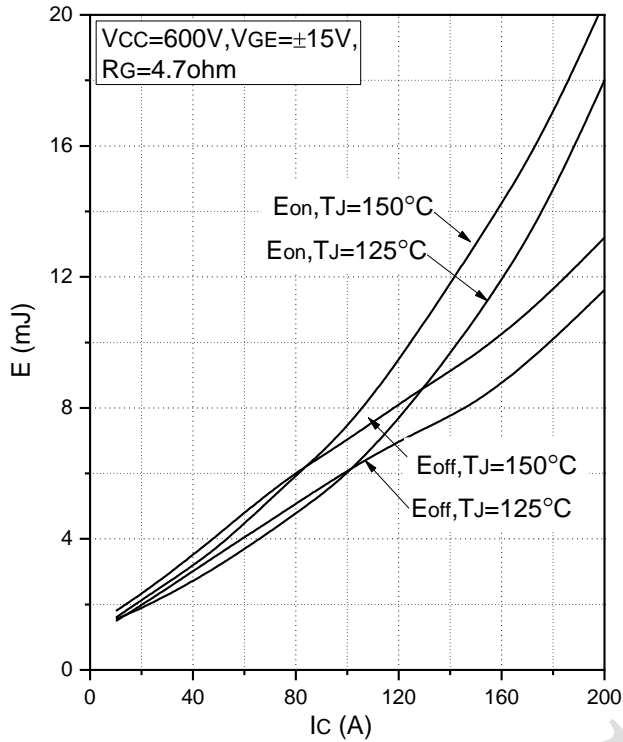


Fig.5 Typical Switching Loss vs. Collector Current

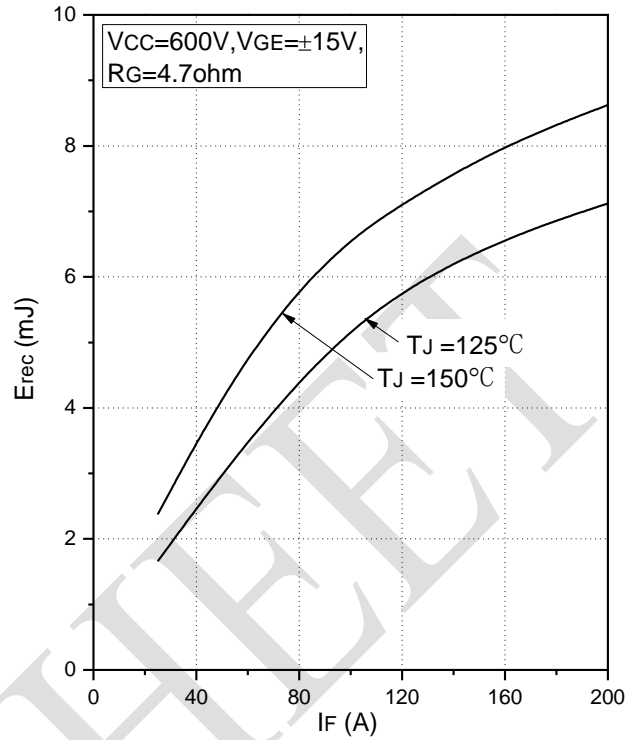


Fig.6 Typical Switching Loss vs. Forward Current

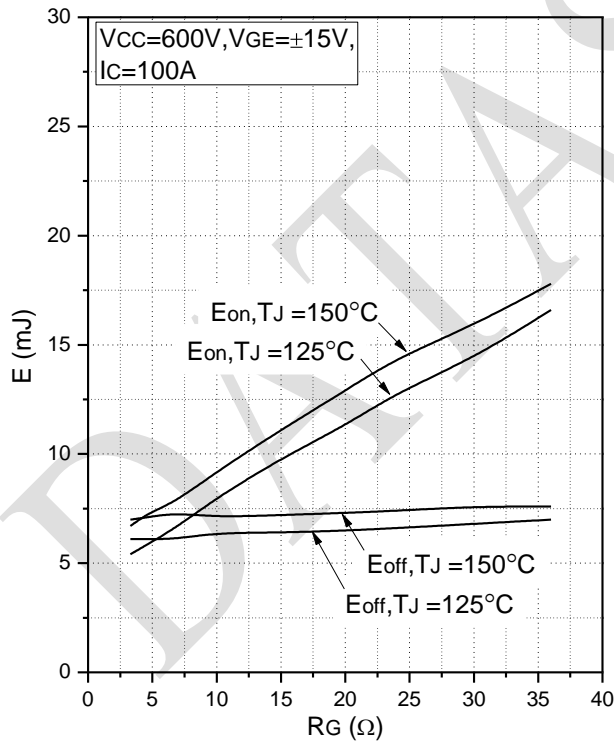


Fig.7 Typical Switching Loss vs. Gate Resistance

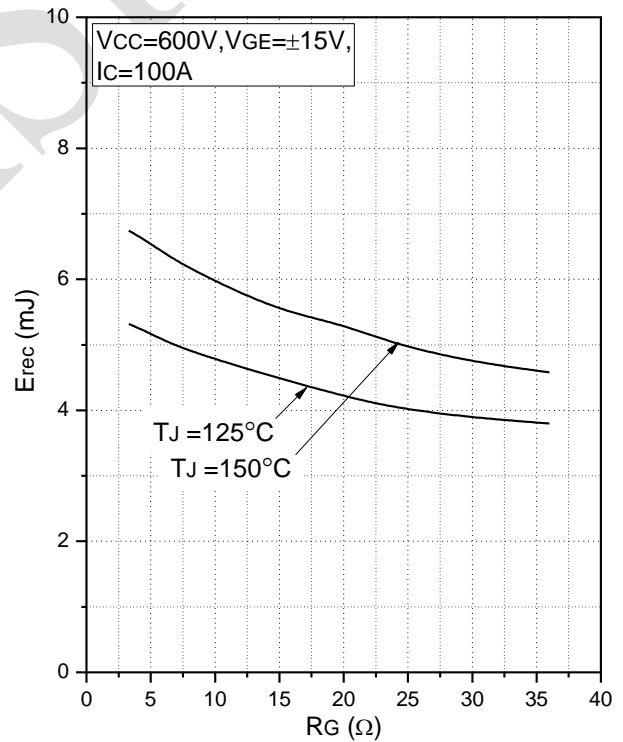


Fig.8 Typical Switching Loss vs. Gate Resistance

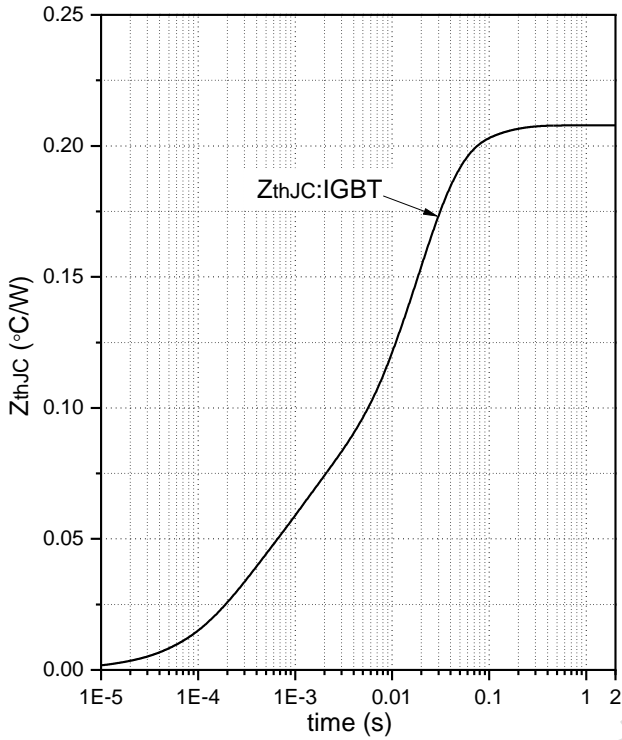


Fig.9 Transient Thermal Impedance (IGBT)

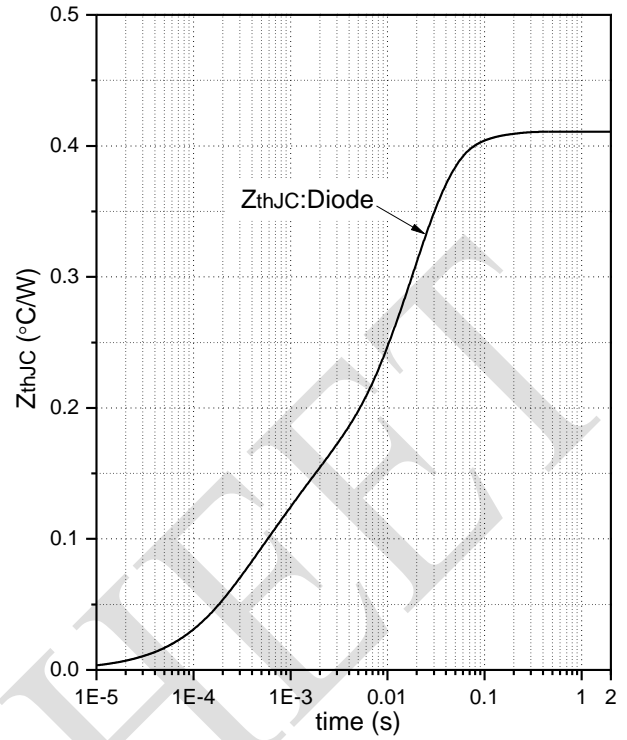
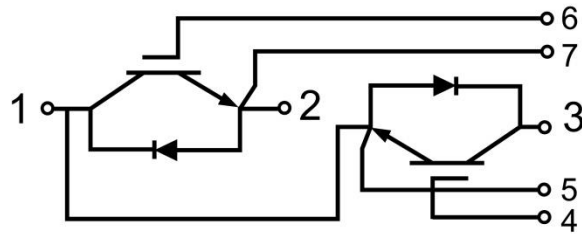


Fig.10 Transient Thermal Impedance (Diode)

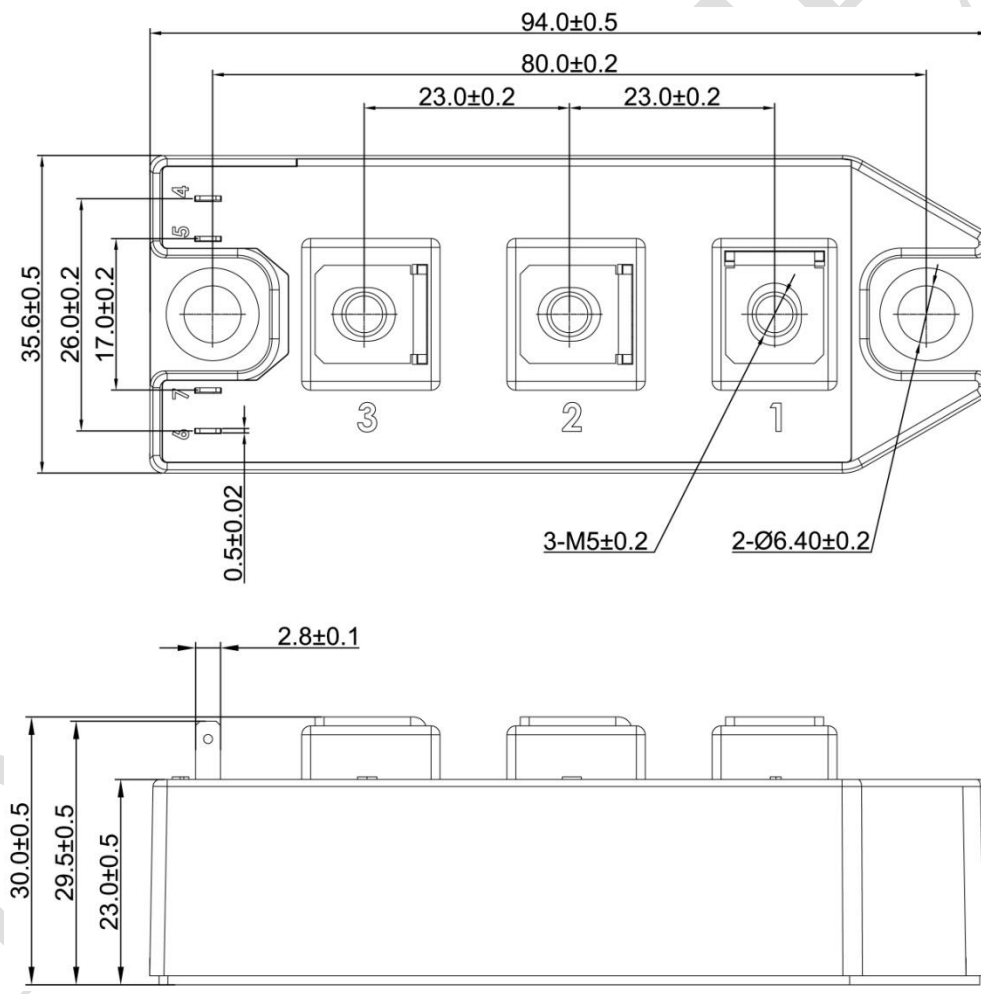
DATA SHEET



Internal Circuit



Package Outline (Unit: mm):





Date	Revision	Notes
03/06/2021	01	Initial Release
07/19/2021	A	Final Version

Announcements

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The released datasheet would be issued with “REV.” + “alphabet characters”.

DATA SHEET