

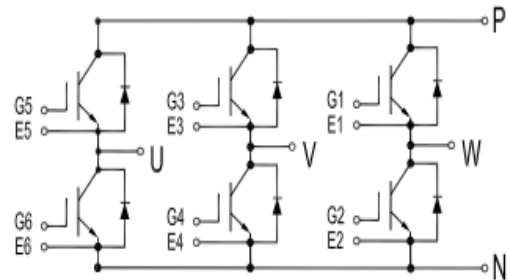


GK75FF60A1H-C

IGBT Module

Features:

- Non Punch Through (NPT) Technology
- Short Circuit Rated > 10μs
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested (2xI_c)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications:

- Industrial Inverters
- Servo Applications

IGBT, Inverter

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

V _{CES}	Collector-Emitter Blocking Voltage		600	V
V _{GES}	Gate-Emitter Voltage		±20	V
I _c	Continuous Collector Current	T _C =80°C	75	A
		T _C =25°C	150	A
I _{CM}	Repetitive Peak Collector Current	T _J =150°C	150	A
t _{sc}	Short Circuit Withstand Time		>10	μs
P _D	Maximum Power Dissipation per IGBT	T _C =25°C T _{Jmax} =150°C	438	W



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

Static Characteristics

Symbol	Description	Conditions	Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=1\text{mA}$, $V_{CE}=V_{GE}$	4.0	5.0	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=75\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	1.90		V
			$T_J=125^\circ\text{C}$	2.15		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			2.80		nF
C_{oes}	Output Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{KHz}$		0.44		nF
C_{res}	Reverse Transfer Capacitance			0.22		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=300\text{V}$, $I_C=75\text{A}$, $R_{Gon}=20\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	194		ns
			$T_J=125^\circ\text{C}$	205		
t_r	Rise Time	$V_{CC}=300\text{V}$, $I_C=75\text{A}$, $R_{Gon}=20\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	74		ns
			$T_J=125^\circ\text{C}$	75		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=300\text{V}$, $I_C=75\text{A}$, $R_{Goff}=20\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	276		ns
			$T_J=125^\circ\text{C}$	290		
t_f	Fall Time	$V_{CC}=300\text{V}$, $I_C=75\text{A}$, $R_{Goff}=20\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	112		ns
			$T_J=125^\circ\text{C}$	131		
E_{on}	Turn-on Switching Loss	$V_{CC}=300\text{V}$, $I_C=75\text{A}$, $R_{Gon}=20\Omega$, $V_{GE}=\pm 15\text{V}$, $di/dt=852\text{A}/\mu\text{s}$ ($T_J=125^\circ\text{C}$) Inductive Load	$T_J=25^\circ\text{C}$	1.02		mJ
			$T_J=125^\circ\text{C}$	1.10		
E_{off}	Turn-off Switching Loss	$V_{CC}=300\text{V}$, $I_C=75\text{A}$, $R_{Goff}=20\Omega$, $V_{GE}=\pm 15\text{V}$, $du/dt=6548\text{V}/\mu\text{s}$ ($T_J=125^\circ\text{C}$) Inductive Load	$T_J=25^\circ\text{C}$	1.40		mJ
			$T_J=125^\circ\text{C}$	1.90		
Q_g	Total Gate Charge	$V_{GE}=+15\text{V}\dots-15\text{V}$	$T_J=25^\circ\text{C}$	396		nC
RBSOA	$I_C=150\text{A}$, $V_{CC}=480\text{V}$, $V_p=600\text{V}$, $R_{Goff}=20\Omega$, $V_{GE}=+15\text{V}$ to 0V , $T_J=125^\circ\text{C}$			Trapezoid		
SCSOA	$V_{CC}=300\text{V}$, $V_{GE}=15\text{V}$, $T_J=125^\circ\text{C}$			10		μs
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case (Per Leg)				0.29	$^\circ\text{C}/\text{W}$



Diode, Inverter

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

V_{RRM}	Repetitive Peak Reverse Voltage	600	V
I_F	Diode Continuous Forward Current	75	A
I_{FM}	Diode Maximum Forward Current	150	A

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

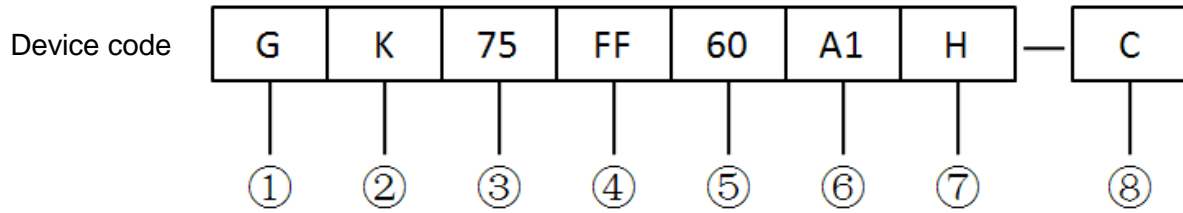
Symbol	Description	Conditions	Min	Typ	Max	Unit
V_{FM}	Forward Voltage	$I_F=75\text{A}$	$T_J=25^\circ\text{C}$	1.60		V
			$T_J=125^\circ\text{C}$	1.65		
I_{rr}	Peak Reverse Recovery Current		$T_J=25^\circ\text{C}$	34.4		A
			$T_J=125^\circ\text{C}$	40.6		
Q_{rr}	Reverse Recovery Charge	$I_F=75\text{A}$, $-di_F/dt=1175\text{A}/\mu\text{s}(T_J=125^\circ\text{C})$, $V_{rr}=300\text{V}$, $V_{GE}=-15\text{V}$	$T_J=25^\circ\text{C}$	2.54		μC
			$T_J=125^\circ\text{C}$	4.10		
E_{rec}	Reverse Recovery Energy		$T_J=25^\circ\text{C}$	0.44		mJ
			$T_J=125^\circ\text{C}$	0.88		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (Per Leg)				0.53	$^\circ\text{C}/\text{W}$

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted)	$f = 50\text{Hz}$, 1minute	2500			V
T_J	Maximum Junction Temperature				150	$^\circ\text{C}$
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	$^\circ\text{C}$
T_{stg}	Storage Temperature		-40		+125	$^\circ\text{C}$
CTI	Comparative Tracking Index		200			
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)				0.06	$^\circ\text{C}/\text{W}$
T	Mounting Screw:M3		1.5		2.0	N·m
G	Weight			30		g



Ordering Information Table



- ① - IGBT Module
- ② - Non Punch Through (NPT) Technology
- ③ - Rated Current (75=75A)
- ④ - Circuit Configuration (Full Bridge)
- ⑤ - Rated Voltage (60=600V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)
- ⑧ - Internal Code

DATA SHEET

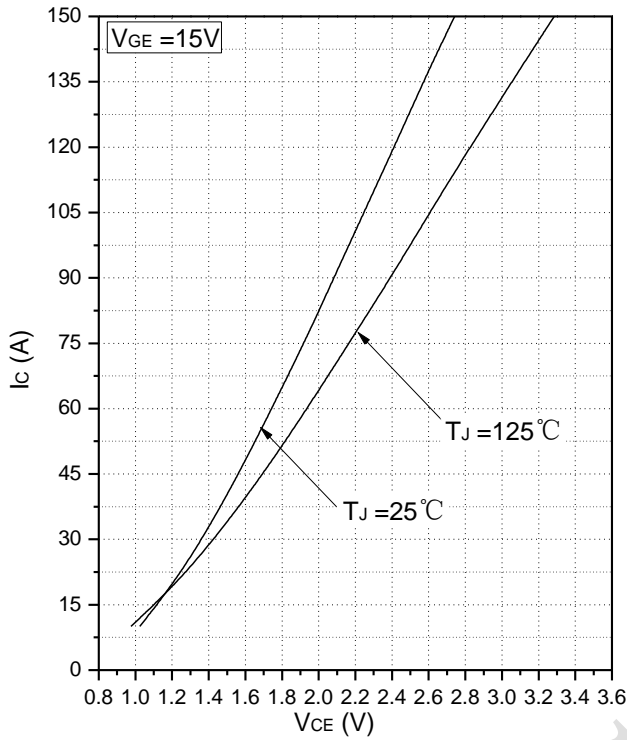


Fig.1 Typical Saturation Voltage Characteristics

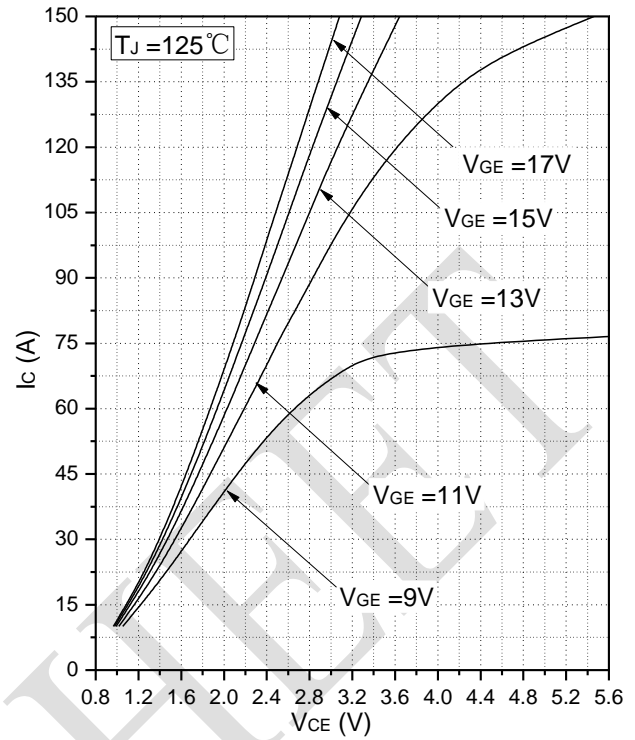


Fig.2 Typical Output Characteristics

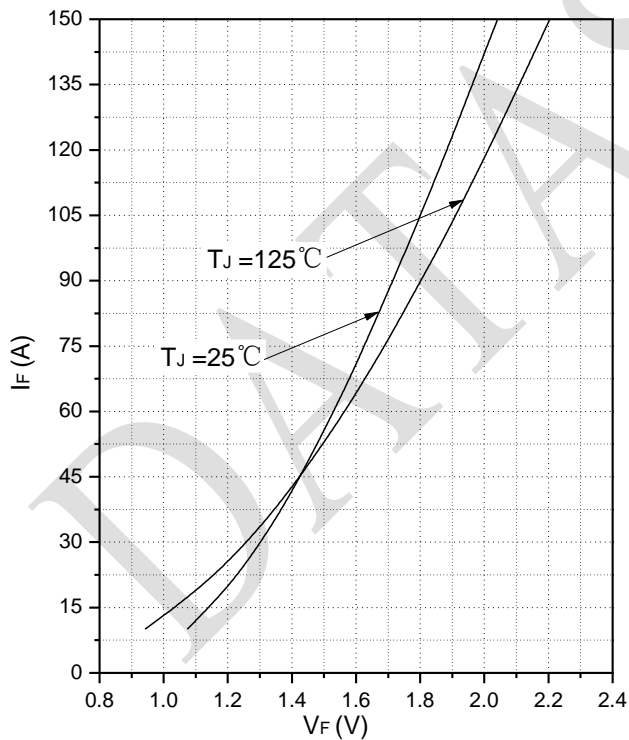


Fig.3 Forward Characteristics of Diode

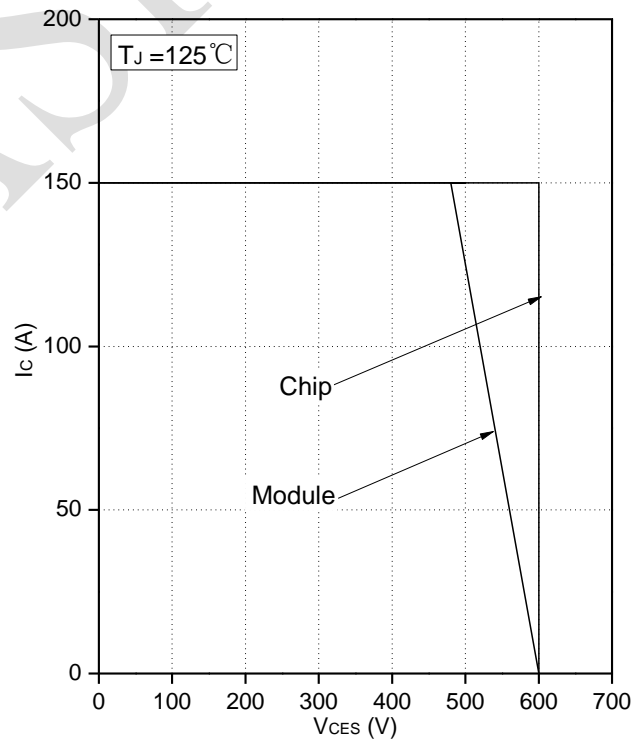


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

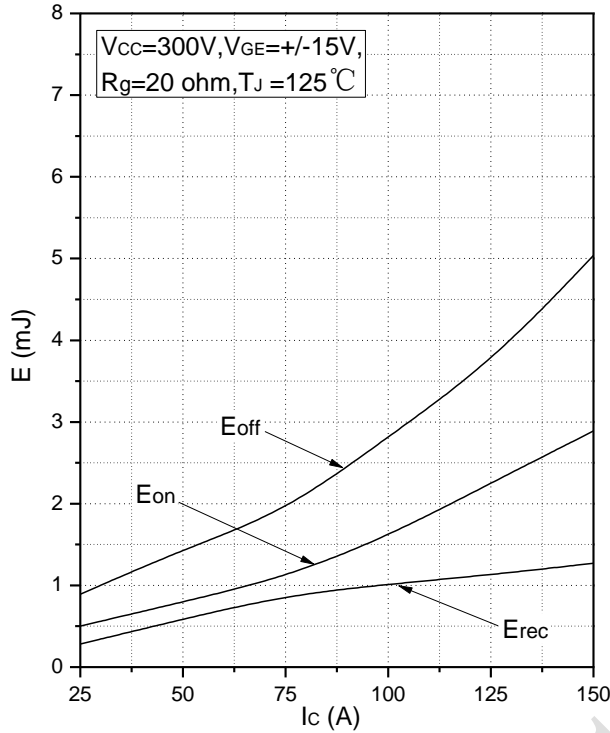


Fig.5 Typical Switching Loss vs. Collector Current

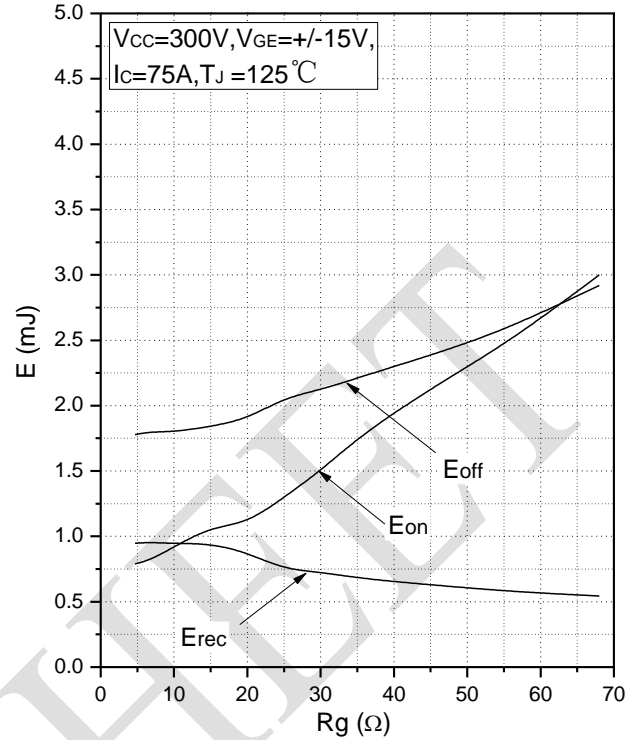


Fig.6 Typical Switching Loss vs. Gate Resistance

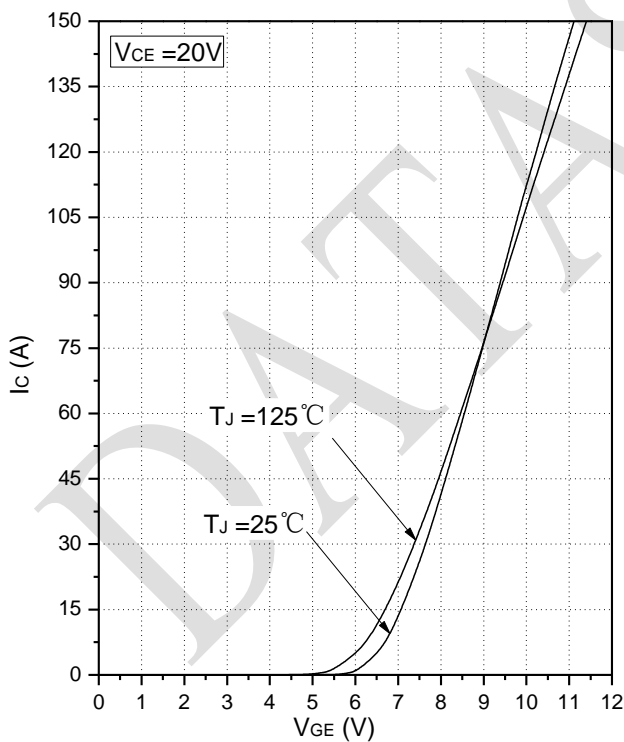


Fig.7 Transfer Characteristics

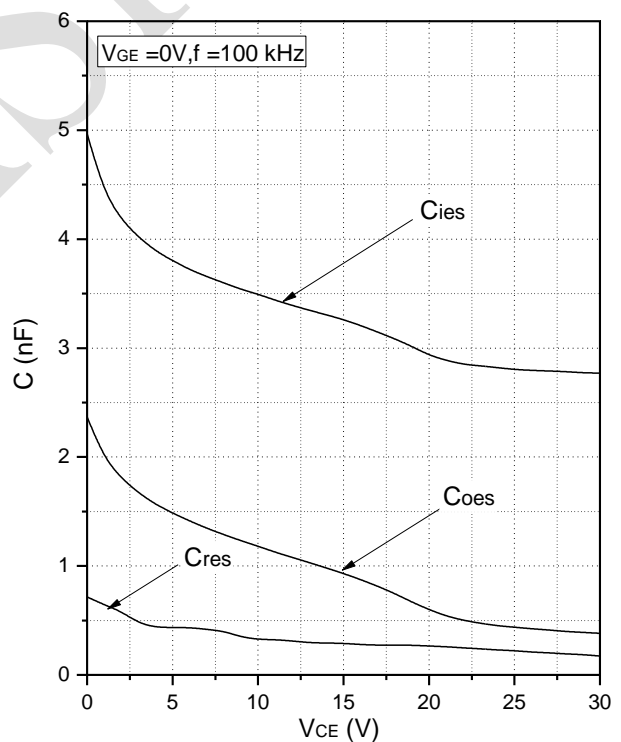


Fig.8 Capacitance Characteristics

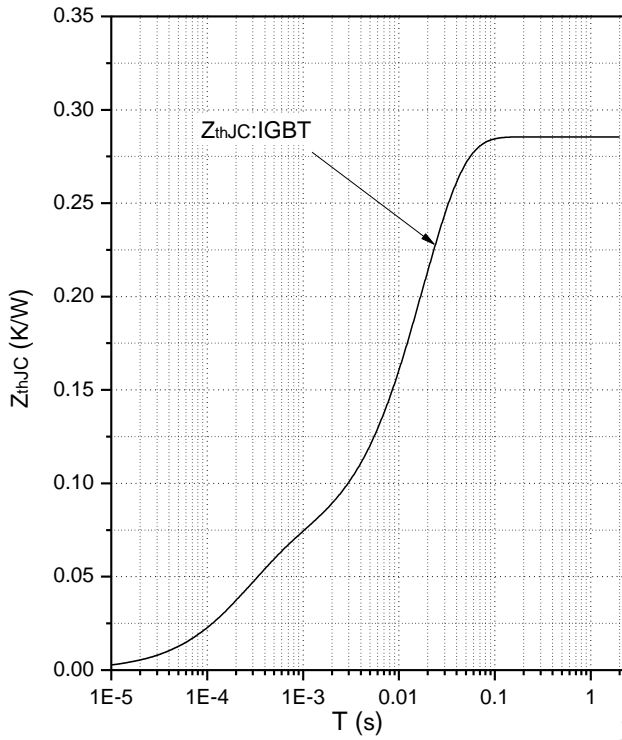


Fig.9 Transient Thermal Impedance IGBT

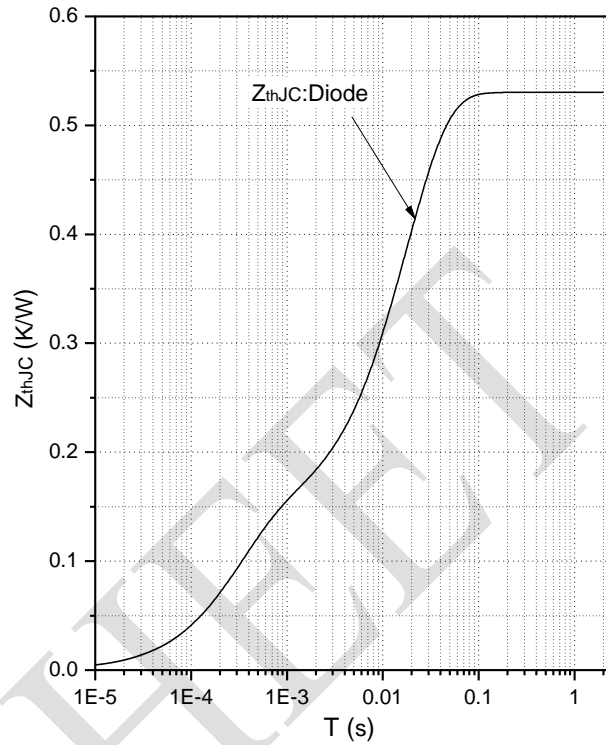
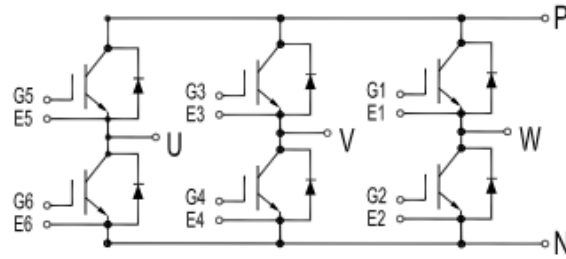


Fig.10 Transient Thermal Impedance Diode

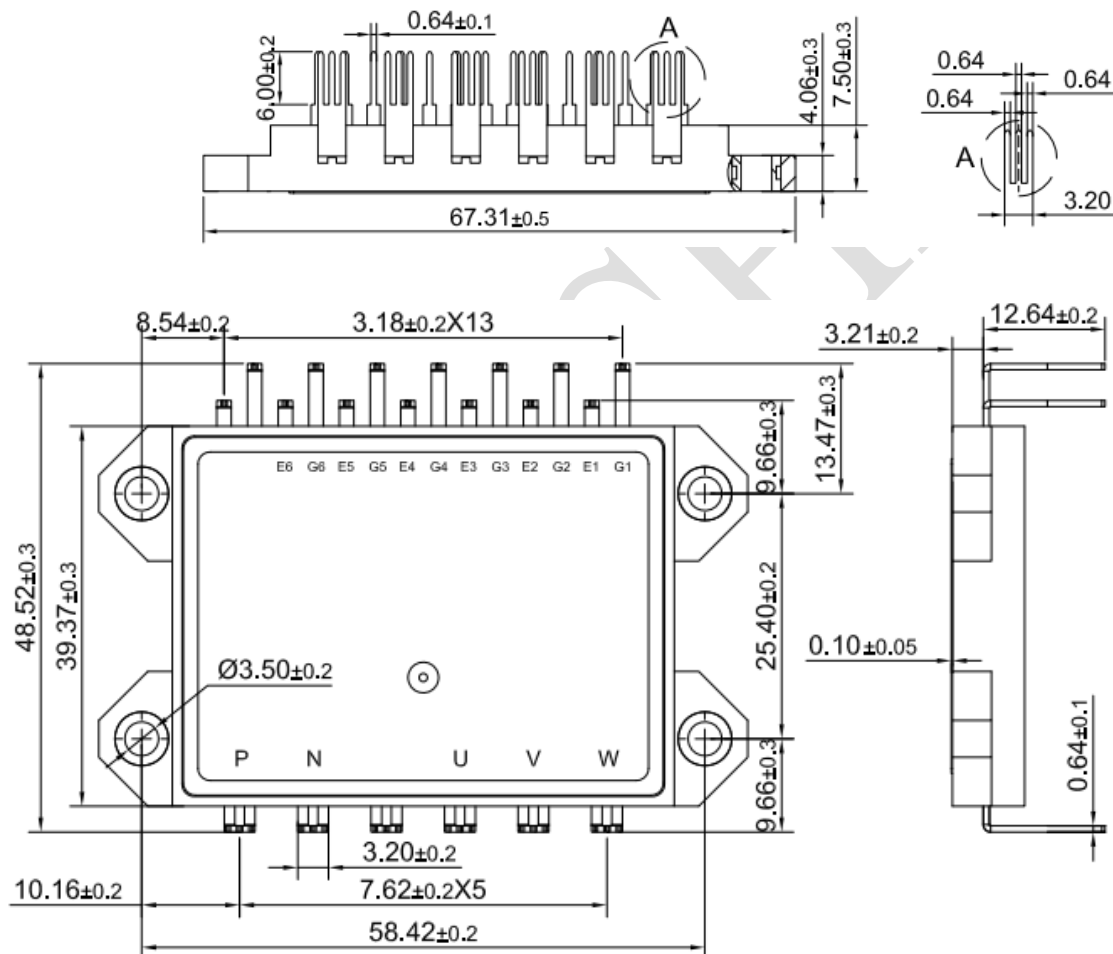
DATA SHEET



Internal Circuit:



Package Outline (Unit: mm):





Date	Revision	Notes
08/31/2022	A	Final Version

Announcement

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