Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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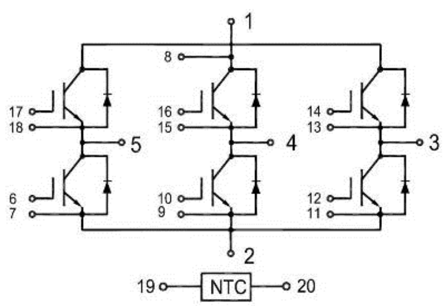
GSID300A125S5C1

6-Pack IGBT Module

Features：

- Trench & Field Stop IGBT
- Short Circuit Rated 10μs
- Low Saturation Voltage: $V_{CE\ (sat)}$ = 2.0V @ I_C = 300A , T_j=25℃
- Low Switching Loss
- 100% RBSOA Tested（2×Ic）
- Low Stray Inductance
- AlN DBC substrate for better thermal conductivity
- Lead Free, Compliant with RoHS Requirement

Applications：



- High Power Converters
- Motor Drivers
- UPS Systems

IGBT, Inverter
Maximum Rated Values (T_C=25℃ unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1250	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Continuous Collector Current	T_C = 80℃	300	A
		T_C = 25℃	600	A
$I_{CM(1)}$	Peak Collector Current Repetitive	T_J = 175℃	600	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C = 25℃ T_{Jmax}=175℃	2500	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 mA, V_{CE} = V_{GE}		4.5	5.3	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C =300A, V_{GE} = 15V	T_J = 25℃		2.00	2.40	V
			T_J = 125℃		2.30		V
			T_J = 150℃				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℃				400	nA
R_{G_INT}	Internal Gate Resistance				TBD		Ω
C_{ies}	Input Capacitance	V_{CE} = 25V, V_{GE} = 0V , f =1MHz			30.8		nF
C_{oes}	Output Capacitance				2.06		nF
C_{res}	Reverse Transfer Capacitance				1.43		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 750V,I_C = 300A, R_G = 10Ω,V_{GE} = ±15V, Inductive Load	T_J = 25℃		899		ns
			T_J = 125℃		900		
			T_J = 150℃				
t_r	Rise Time		T_J = 25℃		198		ns
			T_J = 125℃		207		
			T_J = 150℃				
$t_{d(off)}$	Turn-off Delay Time		T_J = 25℃		783		ns
			T_J = 125℃		825		
			T_J = 150℃				
t_f	Fall Time		T_J = 25℃		123		ns
			T_J = 125℃		150		
			T_J = 150℃				
E_{on}	Turn-on Switching Loss		T_J = 25℃		50.5		mJ
			T_J = 125℃		62.9		
			T_J = 150℃				

E_{off}	Turn-off Switching Loss	V_{CC} = 750V, I_C = 300A, R_G = 10Ω, V_{GE} = ±15V, Inductive Load	T_J = 25℃		29.6		mJ
			T_J = 125℃		35.9		
			T_J = 150℃				
Q_g	Total Gate Charge		T_J = 25℃		2340		nC
			T_J = 125℃		2360		
			T_J = 150℃				
RBSOA	Reverse Bias Safe Operation Area	I_C=600A, V_{CC}=1050V, Vp=1200V, Rg = 10Ω, V_{GE}=+15V to 0V, T_J =150°C		Trapezoid			
SCSOA	Short Circuit Safe Operation Area	V_{CC} < 750V, V_{GE} = 15V, T_J = 150℃		10			μs
$R_{θJC}$	IGBT Thermal Resistance: Junction-To-Case				0.06		℃/W

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

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	300	A
I_{FM}	Repetitive Peak Forward Current	600	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F = 300A, V_{GE} = 0V	T_J = 25℃		1.60		V
			T_J = 125℃		1.70		
			T_J = 150℃				
t_{rr}	Reverse Recovery Time	I_F=300A, di/dt =1213A/μs, V_{rr} = 750V, V_{GE} = -15V	T_J = 25℃		320		ns
			T_J = 125℃		485		
			T_J = 150℃				
I_{rr}	Peak Reverse Recovery Current		T_J = 25℃		166		A
			T_J = 125℃		200		
			T_J = 150℃				
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		32.2		μC

			T_J = 125℃		56.2		
			T_J = 150℃				
E_{rec}	Reverse Recovery Energy		T_J = 25℃		13.7		mJ
			T_J = 125℃		25.3		
			T_J = 150℃				
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case				0.099		℃/W

Internal NTC-Thermistor Characteristics

Symbol	Description	Min	Typ	Max	Unit
R_{25}	T_C =25℃		5		kΩ
△R/R	T_C =100℃，R_{100} =481Ω			±5	%
P_{25}	T_C =25℃		50		mW
$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$		3380		K
$B_{25/80}$	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298.15K))]$		3440		K

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage(All Terminals Shorted)	f = 50Hz, 1minute			2500	V
T_J	Maximum Junction Temperature				175	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+125	℃
$R_{\theta CS}$	Case-To-Sink (Conductive Grease Applied)			0.02		℃/W
M	Mounting Screw:M5		3.0		6.0	N·m
M	Power Terminals Screw: M6		3.0		6.0	N·m
G	Weight			390		g
	Base plate: Copper, Isolation substrate: AlN					

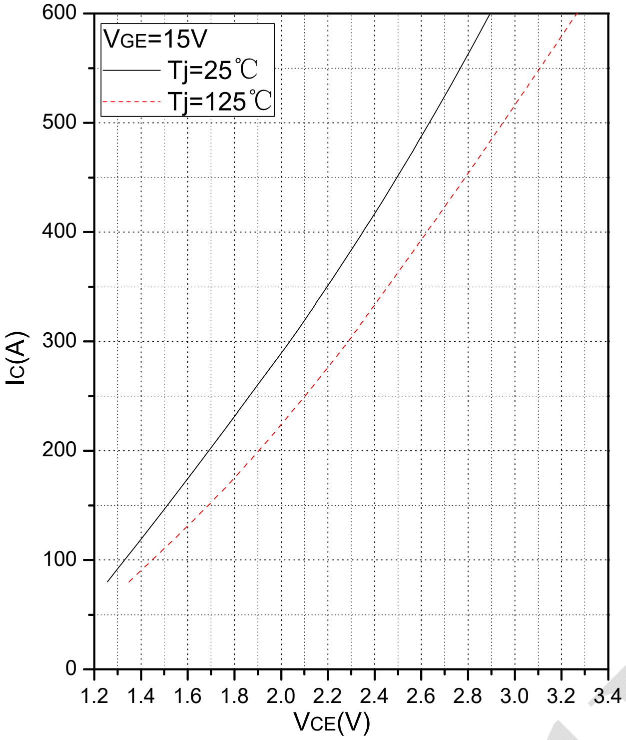


Fig.1 Typical Saturation Voltage Characteristics

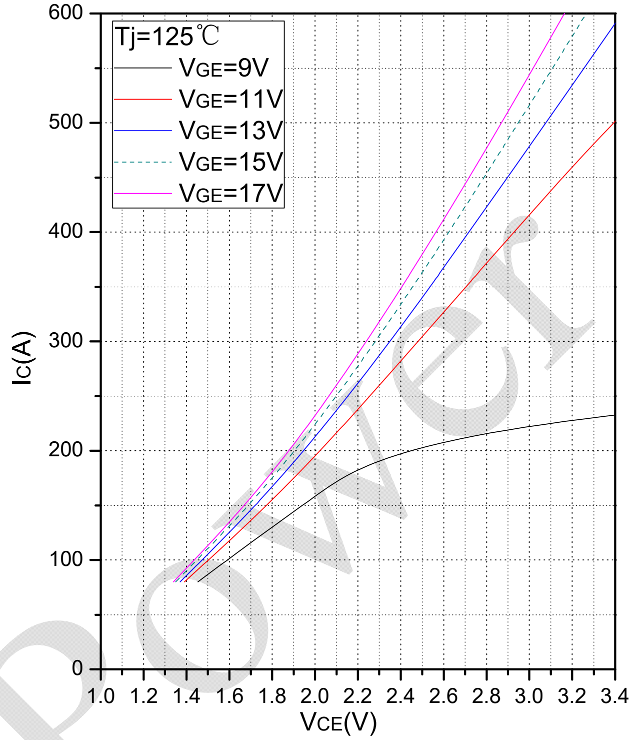


Fig.2 Typical Output Characteristics

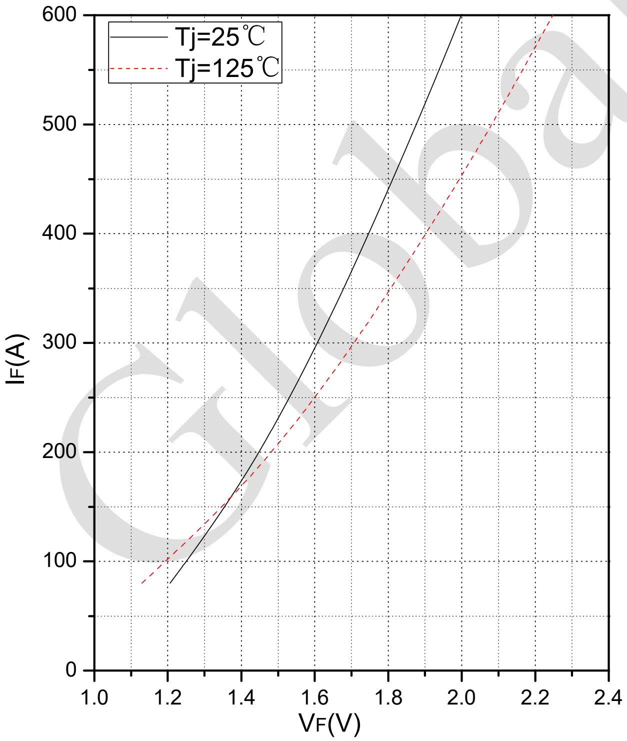


Fig.3 Forward Characteristics of FWD

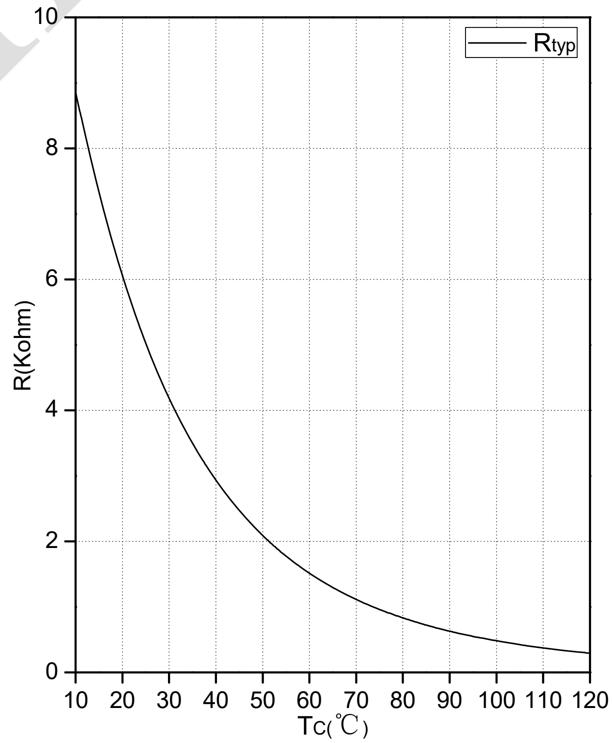


Fig.4 NTC Temperature Characteristics

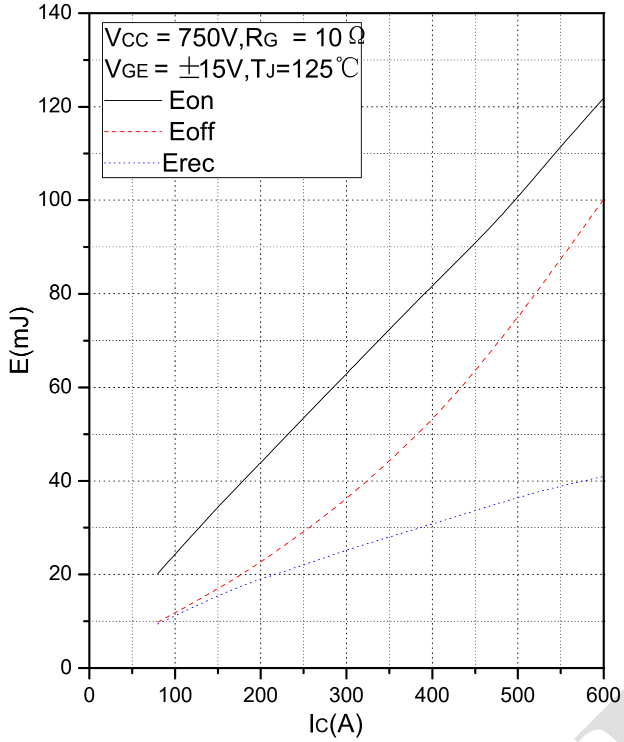


Fig.5 Typical Switching Loss vs. Collector Current

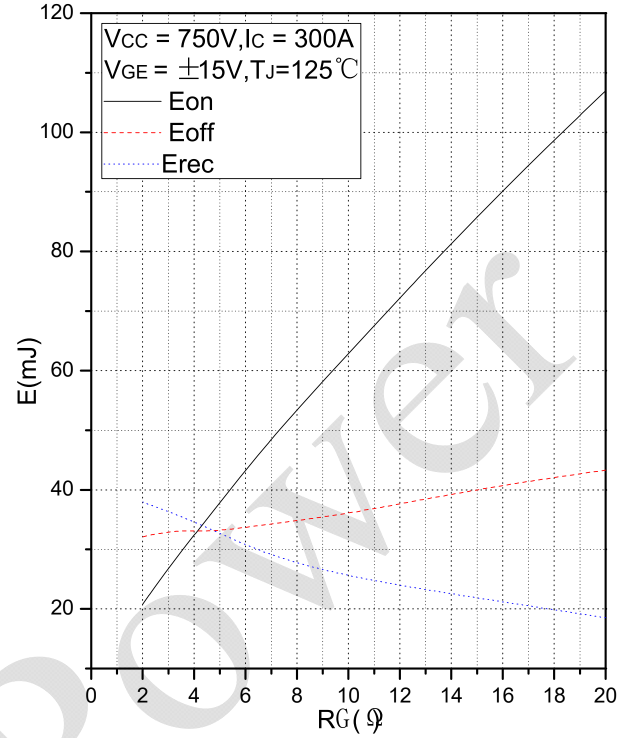


Fig.6 Typical Switching Loss vs. Gate Resistance

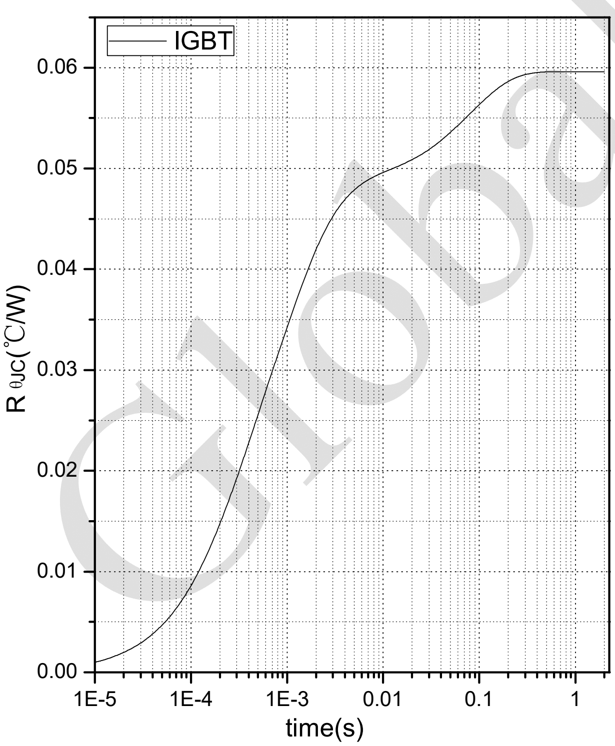


Fig.7 Transient Thermal Impedance (IGBT)

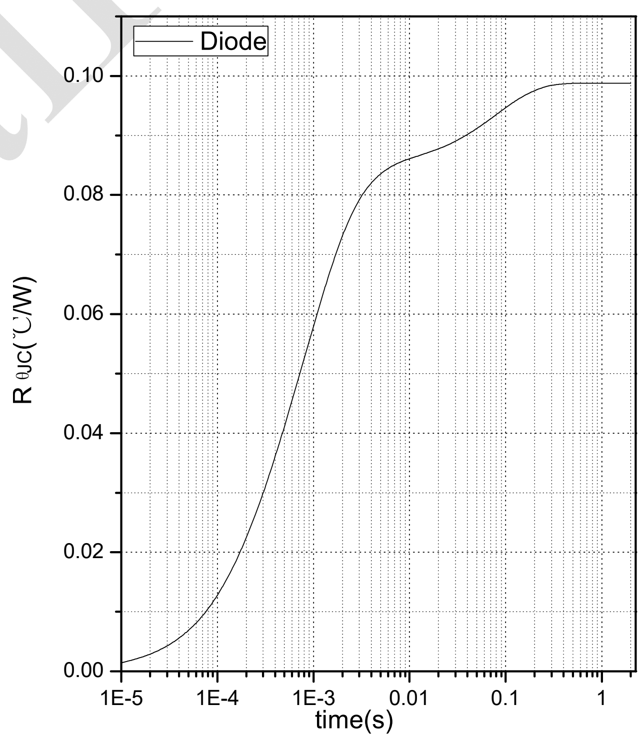


Fig.8 Transient Thermal Impedance (Diode)

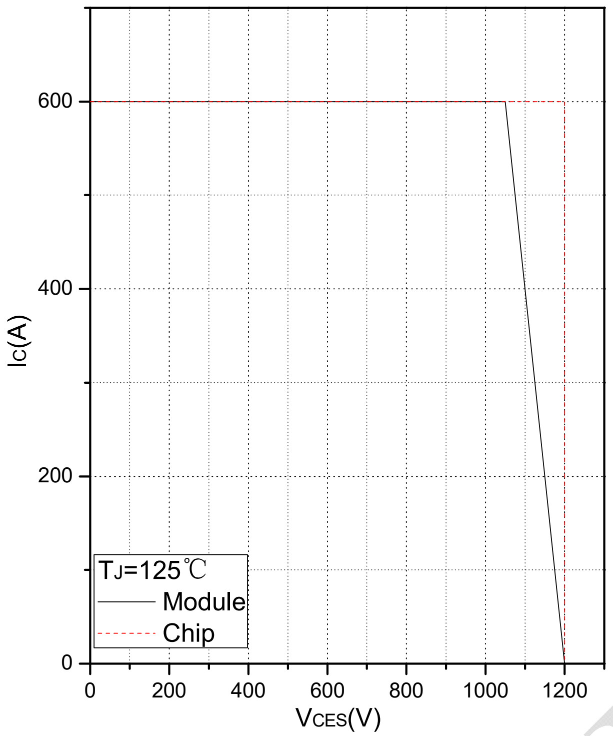
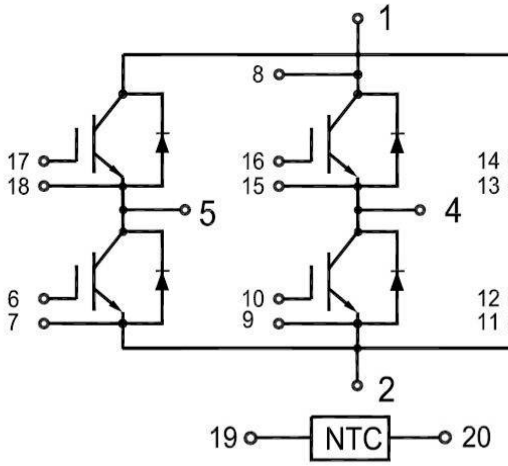
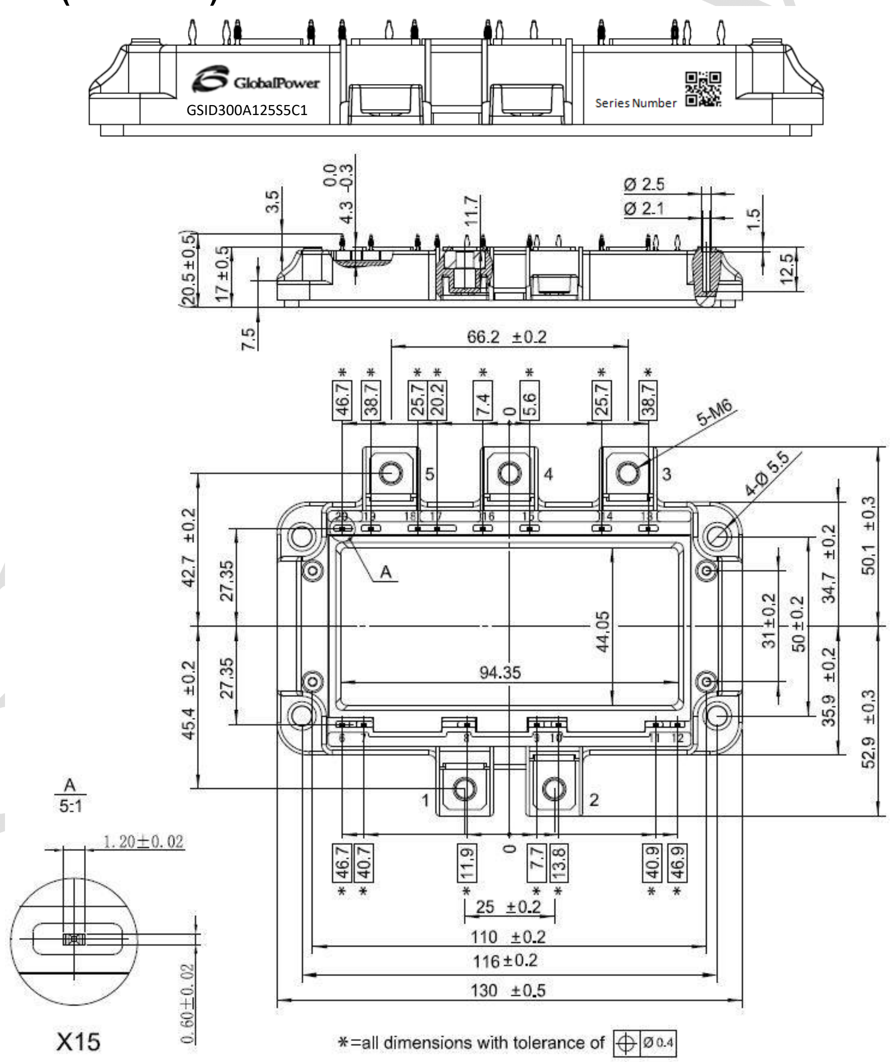


Fig.9 Reverse Bias Safe Operation Area (RBSOA)

Internal Circuit



Package Outline (Unit: mm):



Revision History

Date	Revision	Notes
3/30/2017	0.1	Initial release of preliminary datasheet.

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Notes

- **RoHS Compliance**
  The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented March, 2013. RoHS Declarations for this product can be obtained from the Product Documentation sections of www.gptechgroup.com.

- **REACh Compliance**
  REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact our office at GPTG Headquarters in Lake Forest, California to insure you get the most up-to-date REACh SVHC Declaration.
  REACh banned substance information (REACh Article 67) is also available upon request.

- This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control.

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