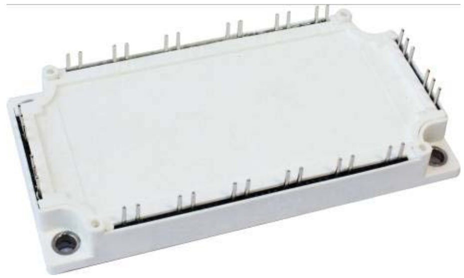
GSID100A120T2C1A

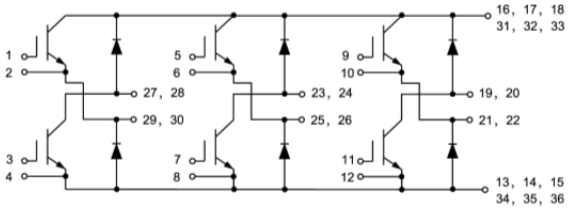
6-Pack IGBT Module

Features：



- Short Circuit Rated 10μs
- Low Saturation Voltage: $V_{CE\ (sat)}$ = 1.90V @ I_C = 100A , T_C=25℃
- 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 = 80℃	100	A
		T_C = 25℃	200	A
$I_{CM(1)}$	Peak Collector Current Repetitive	T_J = 175℃	200	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C = 25℃ T_{Jmax}=175℃	800	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 = 1 mA, V_{CE} = V_{GE}		5.0	5.5	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C =100A, V_{GE} = 15V	T_J = 25℃		1.90	2.10	V
			T_J = 125℃		2.20		V
			T_J = 150℃		2.30		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			13.7		nF
C_{res}	Output capacitance				0.78		nF

Switching Characteristics

Symbol	Description	Conditions		Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 600V,I_C = 100A, R_G = 5Ω,V_{GE} = ±15V, Inductive Load	T_J = 25℃		242		ns
			T_J = 125℃		249		
			T_J = 150℃		247		
t_r	Rise Time		T_J = 25℃		77		ns
			T_J = 125℃		82		
			T_J = 150℃		84		
$t_{d(off)}$	Turn-off Delay Time		T_J = 25℃		249		ns
			T_J = 125℃		268		
			T_J = 150℃		271		
t_f	Fall Time		T_J = 25℃		163		ns
			T_J = 125℃		246		
			T_J = 150℃		343		
E_{on}	Turn-on Switching Loss		T_J = 25℃		4.8		mJ
			T_J = 125℃		6.9		
			T_J = 150℃		7.6		
E_{off}	Turn-off Switching Loss		T_J = 25℃		4.9		mJ

			T_J = 125℃		7.6		
			T_J = 150℃		8.5		
Q_g	Total Gate Charge		T_J = 25℃		898		nC
			T_J = 125℃		935		
			T_J = 150℃		940		
RBSOA	Reverse Bias Safe Operation Area	I_C=200A,V_{CC}=1050V,Vp=1200V, Rg = 5Ω, V_{GE}=+15V to 0V, T_J =150°C		Trapezoid			
SCSOA	Short Circuit Safe Operation Area	V_{CC} = 600V, V_{GE} = 15V, T_J = 150℃		10			μs
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case				0.188		℃/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	100	A
I_{FM}	Repetitive Peak Forward Current	200	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F = 100A , V_{GE} = 0V	T_J = 25℃		1.90		V
			T_J = 125℃		1.90		
			T_J = 150℃		1.80		
I_{rr}	Peak Reverse Recovery Current	I_F＝100A, di/dt =1100A/μs, V_{rr} = 600V, V_{GE} = -15V	T_J = 25℃		60		A
			T_J = 125℃		76.3		
			T_J = 150℃		81.3		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		7.47		μC
			T_J = 125℃		14.36		
			T_J = 150℃		16.87		
E_{rec}	Reverse Recovery Energy		T_J = 25℃		2.94		mJ
			T_J = 125℃		5.61		

			T_J = 150℃		6.78		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case				0.329		℃/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		4.0		6.0	N·m
G	Weight			300		g

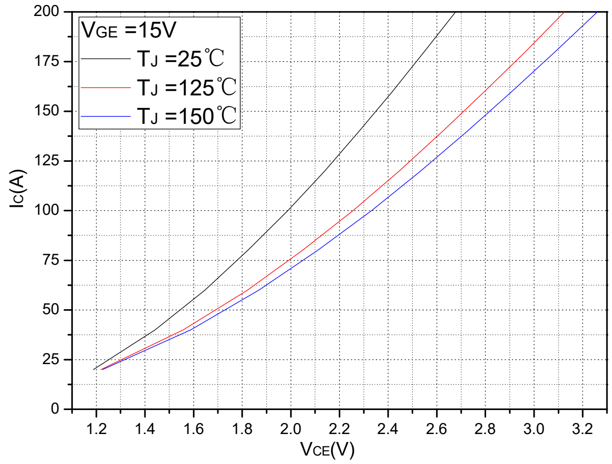


Fig.1Typical Saturation Voltage Characteristics

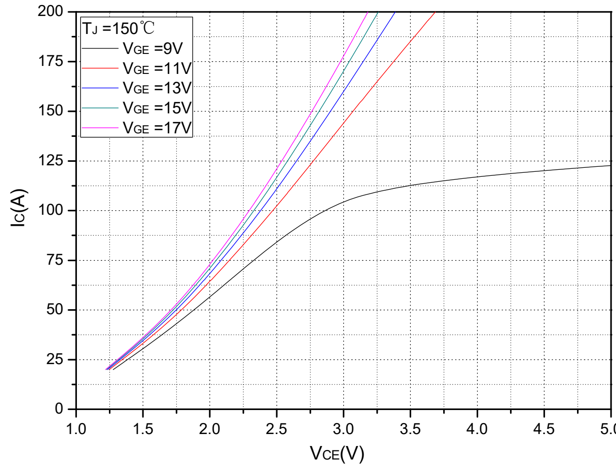


Fig.2 Typical Output Characteristics

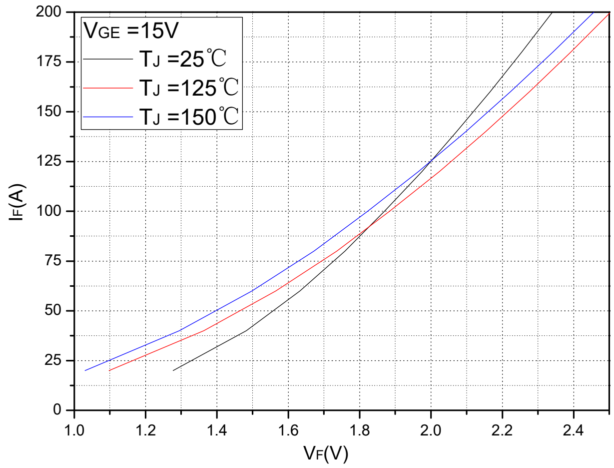


Fig.3 Forward Characteristics of Diode

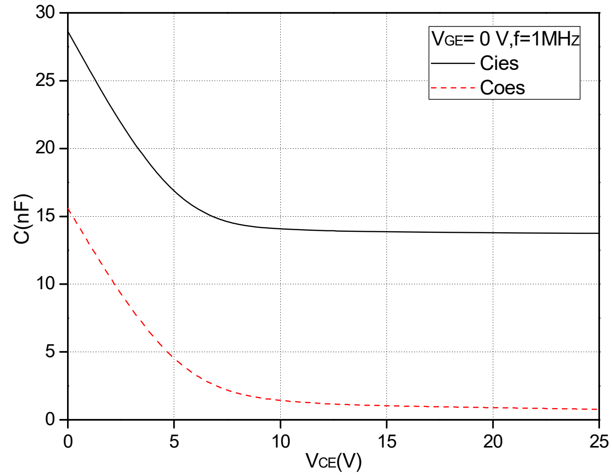


Fig.4 Capacitance Characteristics

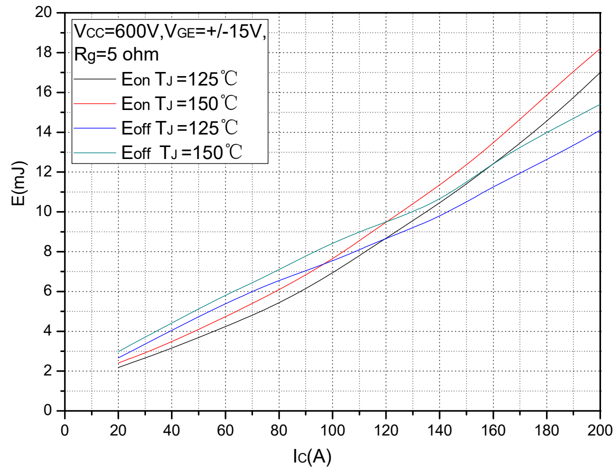


Fig.5 Typical Switching Loss vs. Collector Current

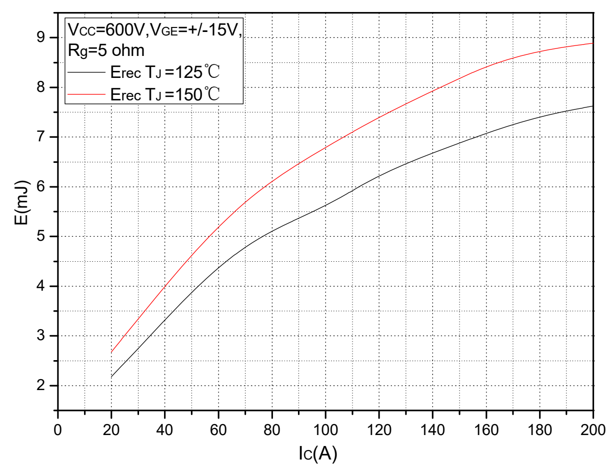


Fig.6 Typical Switching Loss vs. Collector Current

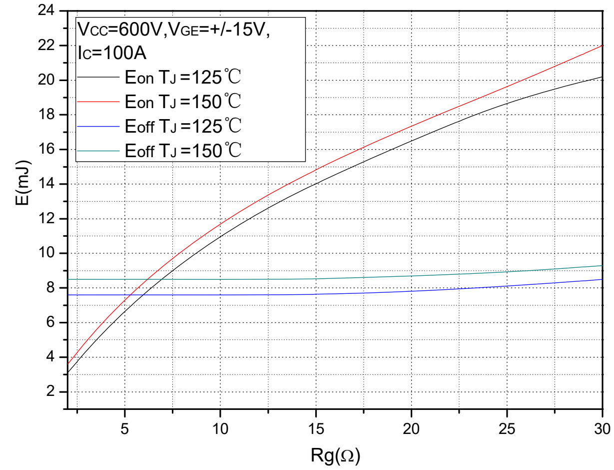


Fig.7 Typical Switching Losses vs. Gate Resistance

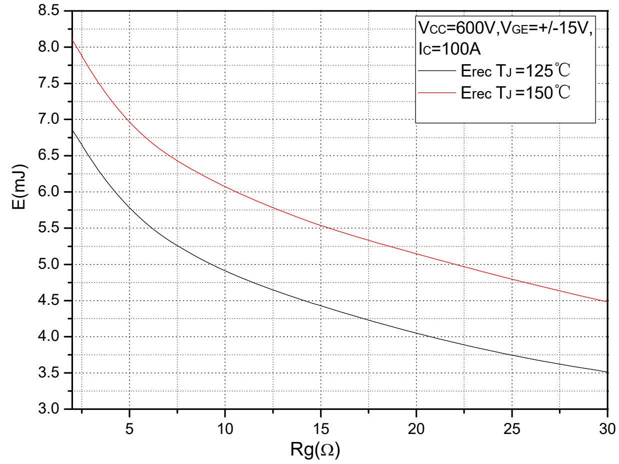


Fig.8 Typical Switching Losses vs. Gate Resistance

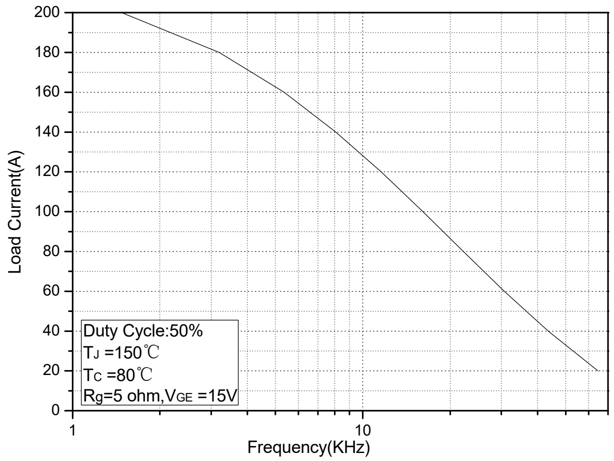


Fig.7 Typical Load Current vs. Frequency

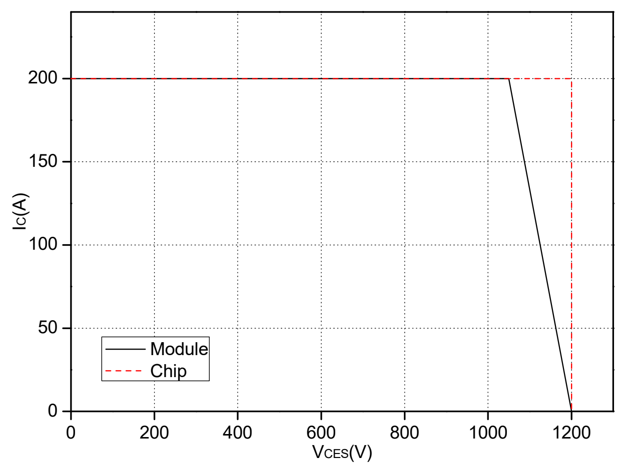


Fig.8 Reverse Bias Safe Operation Area (RBSOA)

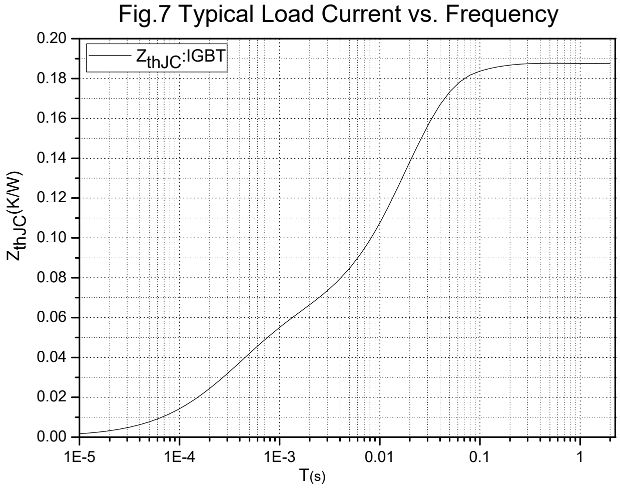


Fig.9 Transient thermal impedance (IGBT)

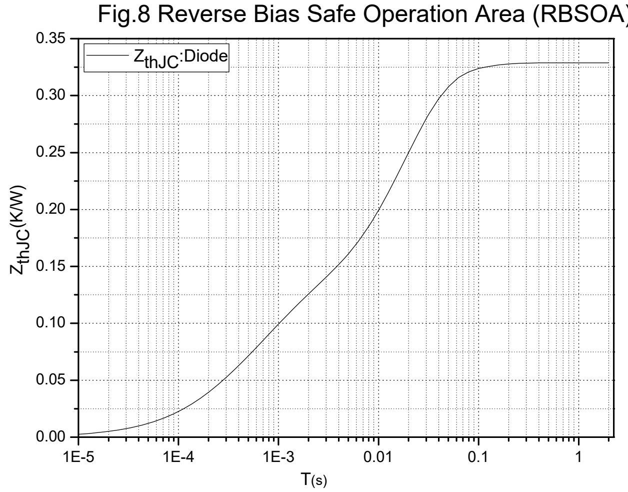
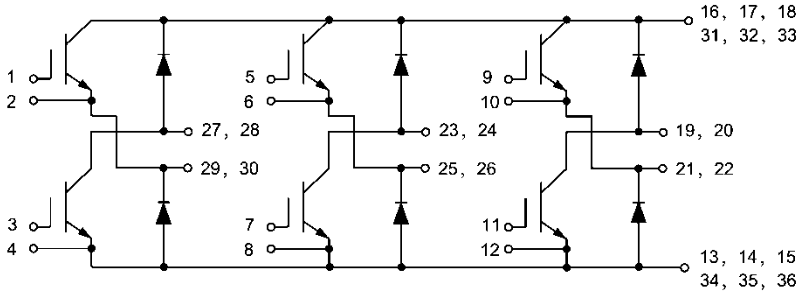
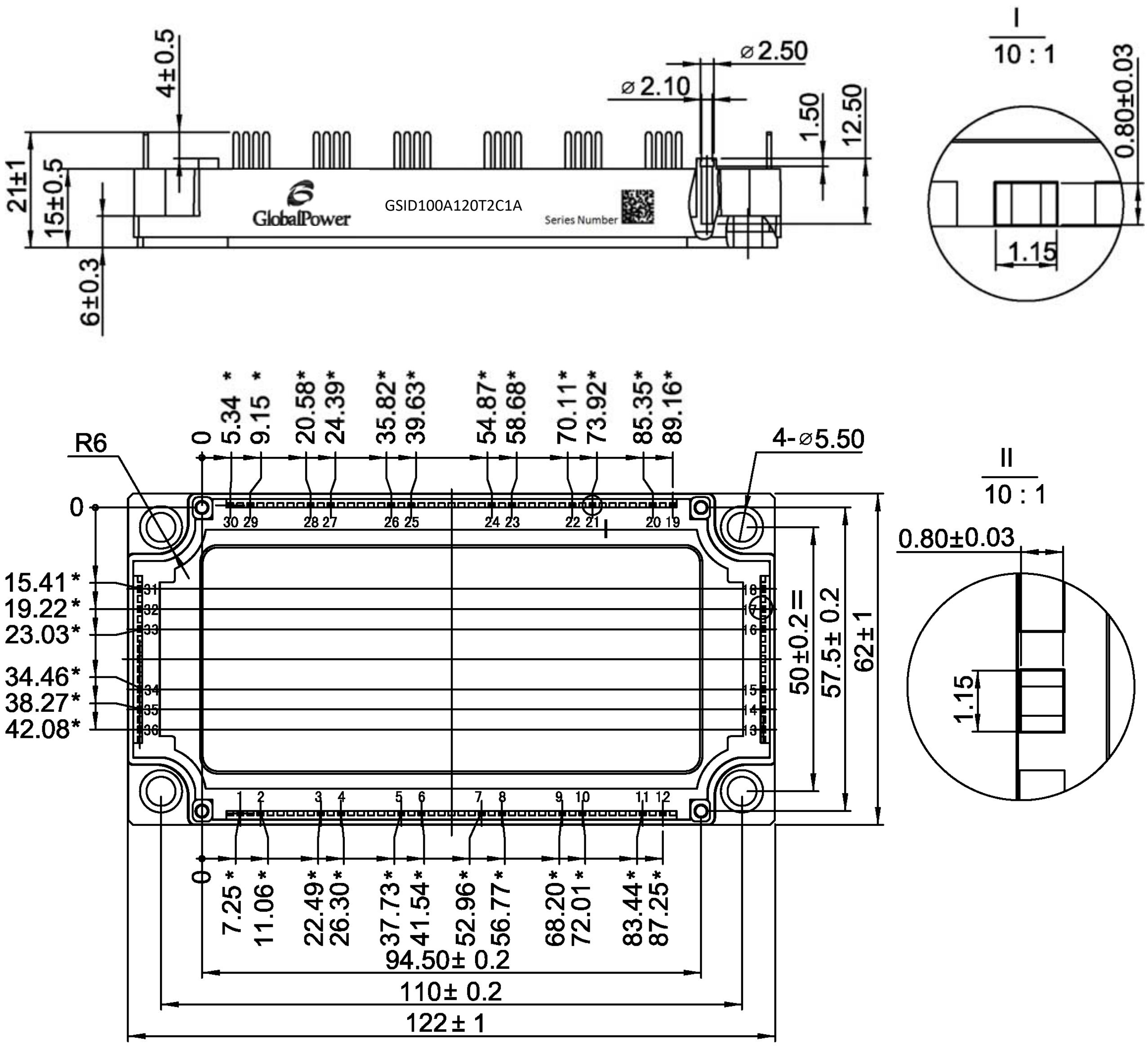


Fig.10 Transient thermal impedance (Diode)

Internal Circuit:



Package Outline (Unit: mm):



Revision History

Date	Revision	Notes
11/30/2015	1.0	Initial release
01/03/2020	1.1	Applied company name change

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.SemiQ.com.

REACh Compliance

REACh substances of high concern (SVHC) information is available for this product. Since the European Chemicals Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future,please contact our office at SemiQ 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.

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