SL600H65TL

IGBT Module

Features：

- Short Circuit Rated 10μs
- Low Saturation Voltage: VCE (sat) = 1.60V @ IC = 600A , TC=25℃
- Low Switching Loss
- 100% RBSOA Tested（2×Ic）
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Applications：

- UPS
- Servo Applications
- High Power Converters
- Motor Drives
- Wind Turbines

IGBT, Inverter

Maximum Rated Values(T_C=25℃Unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		650	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Continuous Collector Current	T_C = 80℃,	600	A
		T_C = 25℃	800	A
$I_{CM(1)}$	Peak Collector Current Repetitive	T_J = 175℃	1200	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation (IGBT)	T_C = 25℃ T_{Jmax}=175℃	2540	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}		3.0	5.4	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 600A, V_{GE} = 15V	T_J = 25℃		1.60	1.90	V
			T_J = 125℃		1.80		V
			T_J = 150℃		1.90		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
C_{ies}	Input Capacitance	V_{CE} = 25V, V_{GE} = 0V, f =1MHz			51.0		nF
C_{oes}	Output Capacitance				2.10		nF
Cres	Reveres transfer capacitance				1.80		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 300V,I_C = 600A, R_G = 4.7 Ω,V_{GE} = ±15V, Inductive Load	T_J = 25℃		1548		ns
			T_J = 125℃		1556		
			T_J = 150℃		1556		
t_r	Rise Time		T_J = 25℃		515		ns
			T_J = 125℃		523		
			T_J = 150℃		520		
$t_{d(off)}$	Turn-off Delay Time		T_J = 25℃		1440		ns
			T_J = 125℃		1480		
			T_J = 150℃		1480		
t_f	Fall Time		T_J = 25℃		229		ns
			T_J = 125℃		220		
			T_J = 150℃		222		
E_{on}	Turn-on Switching Loss		T_J = 25℃		13.26		mJ
			T_J = 125℃		15.96		
			T_J = 150℃		16.28		

E_{off}	Turn-off Switching Loss	V_{CC} = 300V,I_C = 600A, R_G = 4.7 Ω,V_{GE} = ±15V, Inductive Load	T_J = 25℃		54.5		mJ
			T_J = 125℃		58.7		
			T_J = 150℃		60.1		
Q_g	Total Gate Charge		T_J = 25℃		4410		nC
			T_J = 125℃		4411		
			T_J = 150℃		4421		
RBSOA	RBSOA	I_C=1200A,V_{CC}=600V,Vp=650V, Rg = 4.7Ω, V_{GE}=+15V to 0V, T_J =150°C		Trapezoid			
SCSOA	SCSOA	V_{CC} = 300V, V_{GE} = 15V, T_J = 150℃		10			μs
$R_{\theta JC}$	Junction-To-Case (per leg)				0.059		℃/W

Diode, Inverter

Maximum Rated Values (T_C=25℃Unless otherwise specified)

V_{RRM}	Repetitive peak reverse voltage	650	V
I_F	Diode Continuous Forward Current	600	A
I_{FM}	Peak FWD Current Repetitive	1200	A

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

V_{FM}	Forward Voltage	I_F = 600A , V_{GE} = 0V	T_J = 25℃		1.70		V
			T_J = 125℃		1.80		
			T_J = 150℃		1.80		
I_{rr}	Peak Reverse Recovery Current	I_F=600A, di/dt =1160A/μs, V_{rr} = 300V, V_{GE} = -15V	T_J = 25℃		94		A
			T_J = 125℃		128		
			T_J = 150℃		134		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		8.22		μC
			T_J = 125℃		19.83		
			T_J = 150℃		22.80		

E_{rec}	Reverse Recovery Energy	I_F=600A, di/dt =1160A/μs, V_{rr} = 300V, V_{GE} = -15V	T_J = 25℃		0.73		mJ
			T_J = 125℃		2.23		
			T_J = 150℃		2.57		
$R_{\theta JC}$	Junction-To-Case (per leg)				0.115		℃/W

Internal NTC- Thermistor Characteristic

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)			0.1		℃/W
M	Power Terminals Screw:M5		3.0		5.0	N·m
M	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			300		g

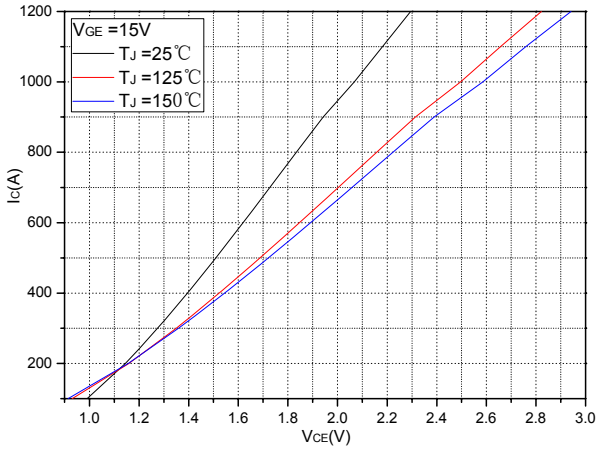


Fig.1 Typical Saturation Voltage Characteristics

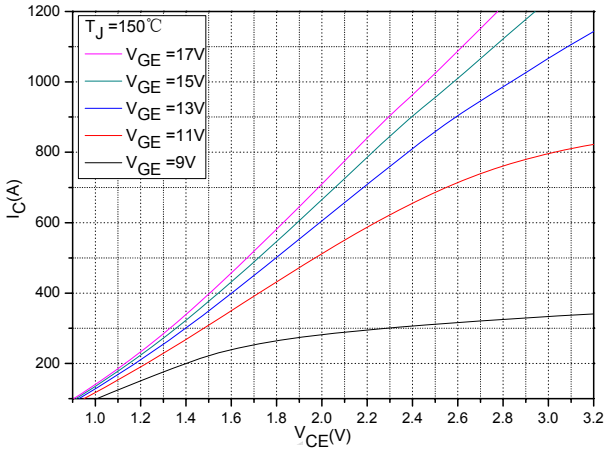


Fig.2 Typical Output Characteristics

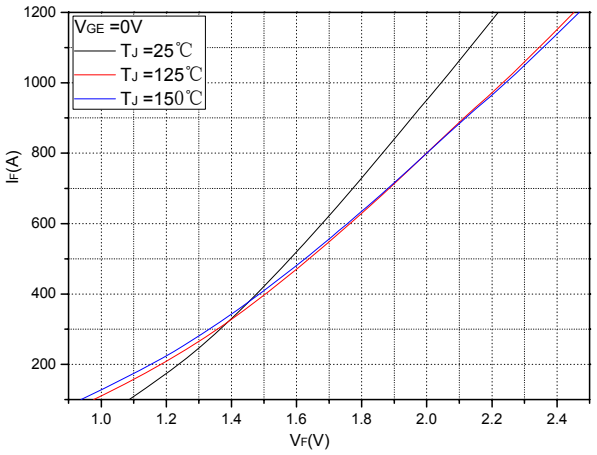


Fig.3 Forward Characteristics of FWD

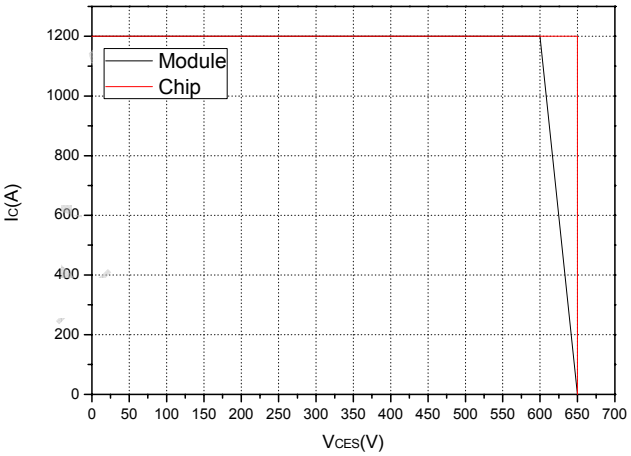


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

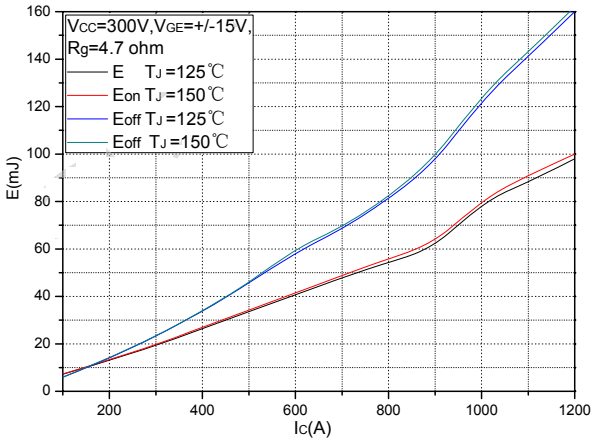


Fig.5 Typical Switching Loss vs. Collector Current

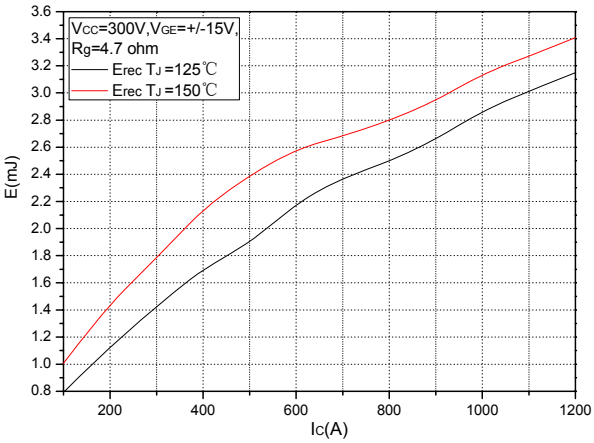


Fig.6 Typical Switching Loss vs. Collector Current

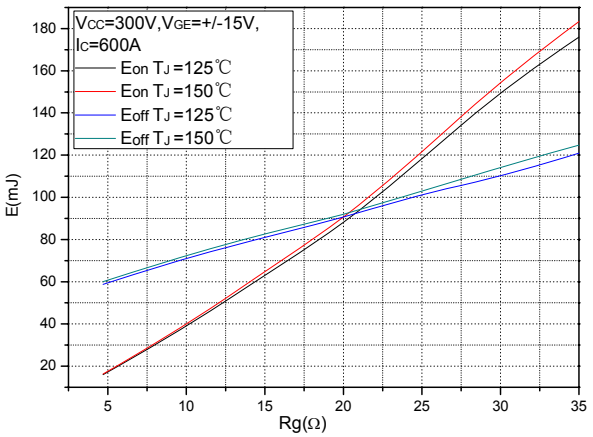


Fig.5 Typical Switching Loss vs. Gate Resistance

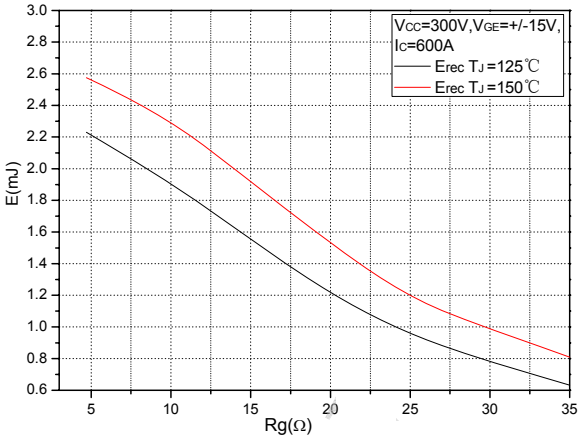


Fig.6 Typical Switching Loss vs. Gate Resistance

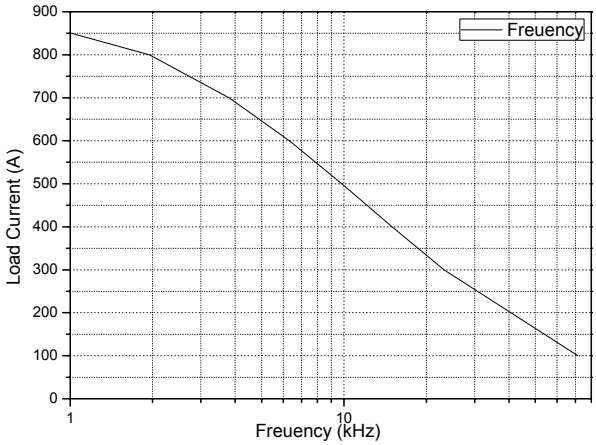


Fig.7 Typical Load Current vs. Frequency

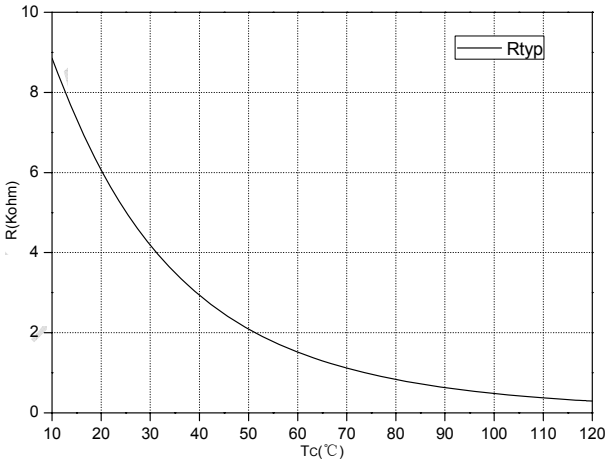


Fig.8 NTC Temperature characteristics

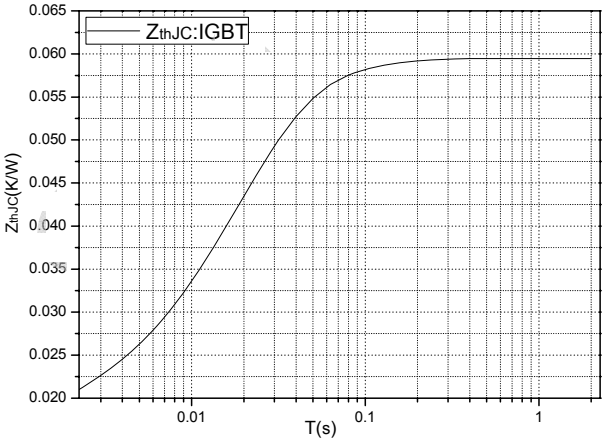


Fig.9 Transient thermal impedance (IGBT)

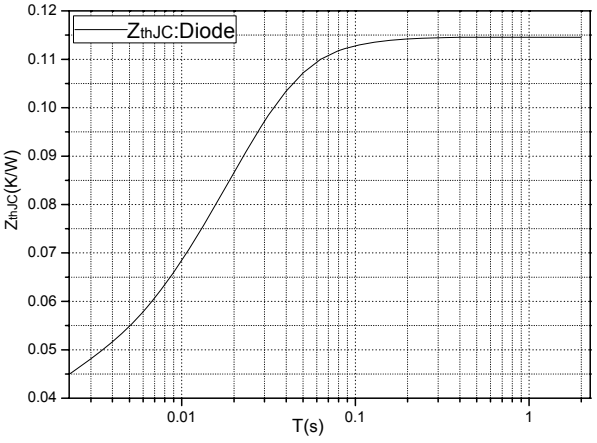
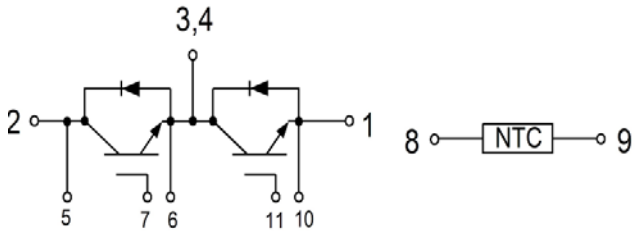
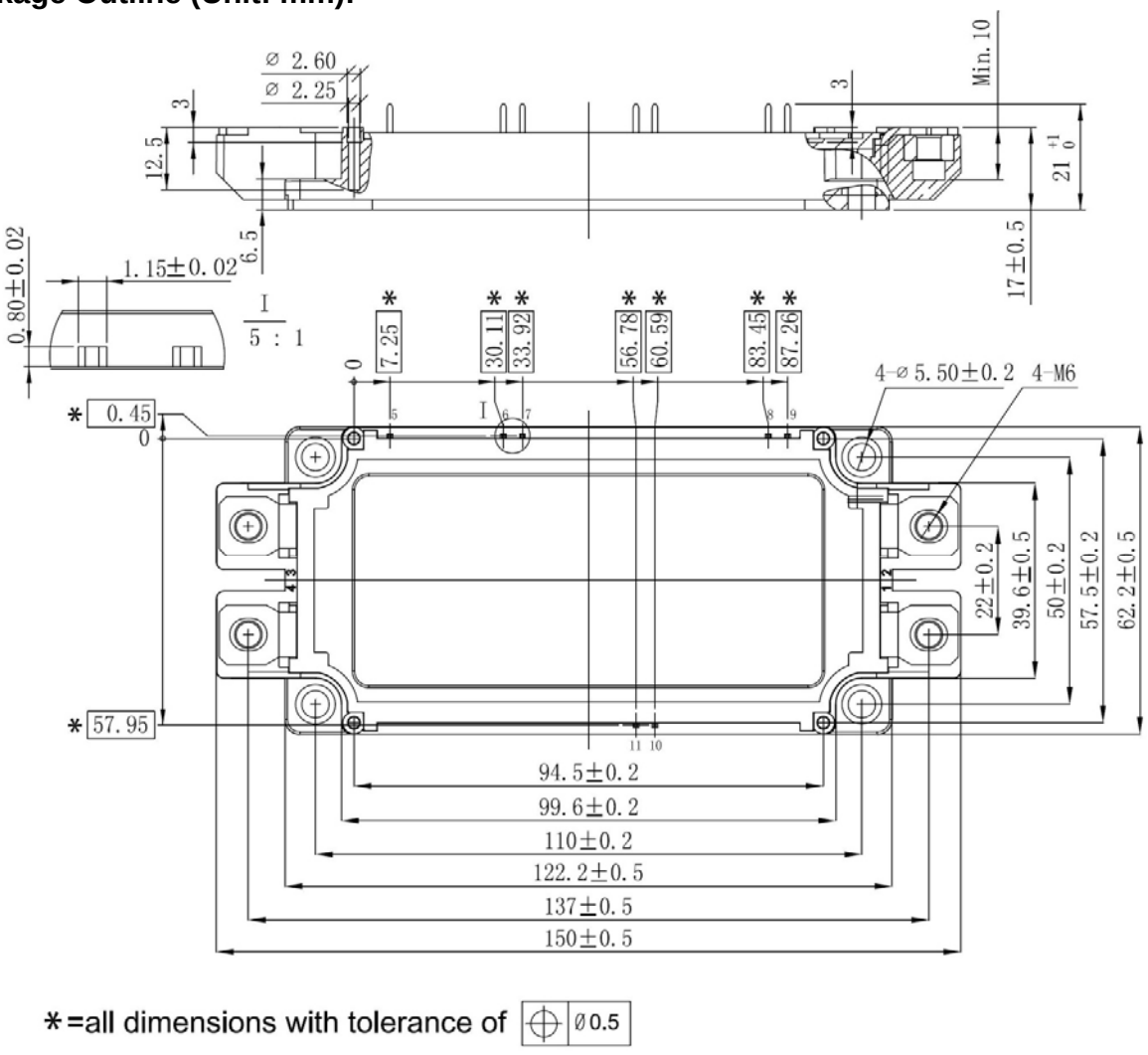


Fig.10 Transient thermal impedance (Diode)

Internal Circuit



Package Outline (Unit: mm):



*=all dimensions with tolerance of ⌖ Ø0.5