SL600H120TL

IGBT Module

Features：

- Low Saturation Voltage: $V_{CE\ (sat)}$ = 1.80V @ I_C = 600A , T_C=25℃
- Low Switching Loss
- 100% RBSOA Tested（2×Ic）
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Applications：

- High Power Converters
- Motor Drives
- UPS Systems
- Wind Turbines

Maximum Rated Values of IGBT(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℃,	600	A
		T_C = 25℃	1130	A
I_{CM}	Repetitive Peak Collector Current	T_J = 175℃	1200	A
P_D	Maximum Power Dissipation per IGBT	T_C = 25℃ T_{Jmax}=175℃	3060	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	IC = 1mA, VCE = VGE		5.0	5.5	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 600A, V_{GE} = 15V	T_J = 25℃		1.80	2.10	V
			T_J = 125℃		2.10		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				3.30		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 600V,I_C = 600A, R_G = 5 Ω,V_{GE} = ±15V, Inductive Load	T_J = 25℃		1340		ns
			T_J = 125℃		1270		
			T_J = 150℃		1265		
t_r	Rise Time		T_J = 25℃		195		ns
			T_J = 125℃		205		
			T_J = 150℃		185		
$t_{d(off)}$	Turn-off Delay Time		T_J = 25℃		1020		ns
			T_J = 125℃		1050		
			T_J = 150℃		1070		
t_f	Fall Time		T_J = 25℃		175		ns
			T_J = 125℃		190		
			T_J = 150℃		195		
E_{on}	Turn-on Switching Loss		T_J = 25℃		16.9		mJ
			T_J = 125℃		22.4		
			T_J = 150℃		24.2		

E_{off}	Turn-off Switching Loss	V_{CC} = 600V,I_C = 600A, R_G = 5 Ω,V_{GE} = ±15V, Inductive Load	T_J = 25℃		101.0		mJ
			T_J = 125℃		120.6		
			T_J = 150℃		124.7		
Q_g	Total Gate Charge		T_J = 25℃		3640		nC
RBSOA	RBSOA	I_C=1200A,V_{CC}=960V,Vp=1200V, Rg = 15Ω, V_{GE}=+15V to 0V, T_J =150°C		Trapezoid			
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case				0.05		℃/W

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

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

Electrical Characteristics of Diode

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	$_F$ = 600A , V_{GE} = 0V	T_J = 25℃		2.00	2.30	V
			T_J = 125℃		2.20		
			T_J = 150℃		2.15		
I_{rr}	Peak Reverse Recovery Current	I_F=600A, di/dt =2900A/μs, V_{rr} = 600V, V_{GE} = -15V	T_J = 25℃		205		A
			T_J = 125℃		290		
			T_J = 150℃		305		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		25.6		μC
			T_J = 125℃		52.8		
			T_J = 150℃		61.4		
E_{rec}	Reverse Recovery Energy		T_J = 25℃6		13.5		mJ
			T_J = 125℃		27.6		
			T_J = 150℃		31.7		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case				0.10		℃/W

Internal NTC-Thermistor Characteristics

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
T	Power Terminals Screw:M5		3.0		5.0	N·m
T	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			330		g

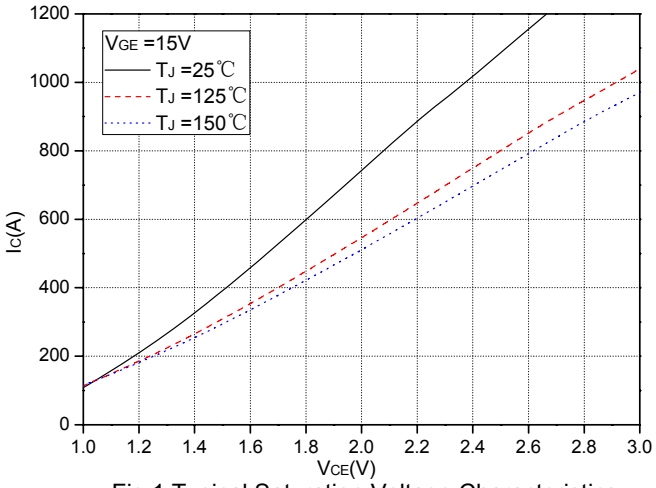


Fig.1 Typical Saturation Voltage Characteristics

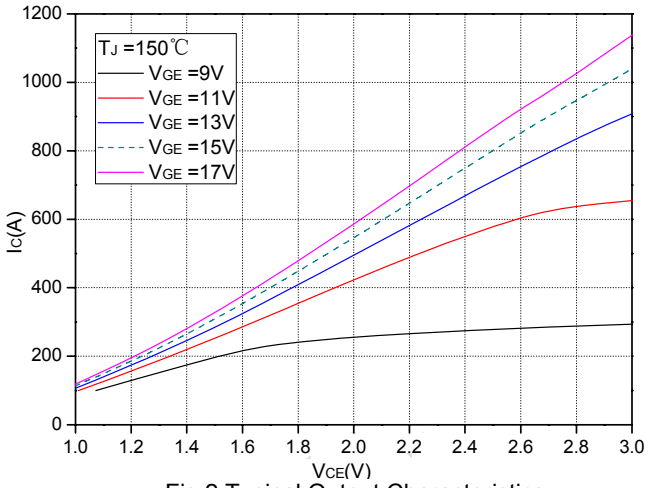


Fig.2 Typical Output Characteristics

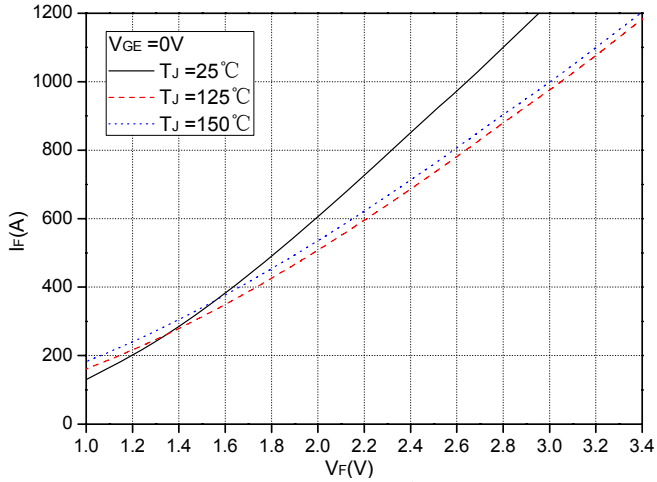


Fig.3 Forward Characteristics of Diode

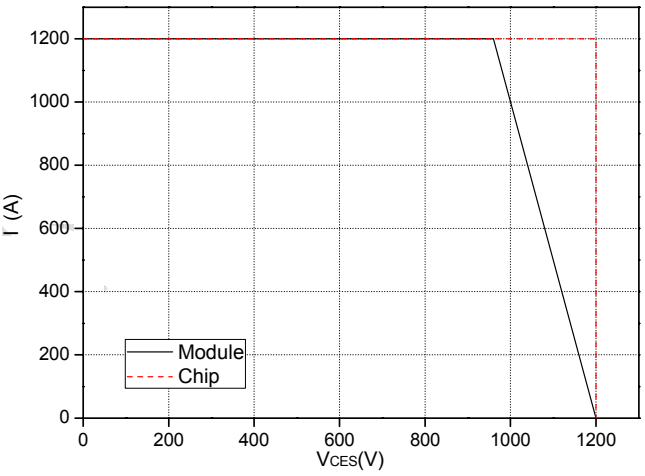


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

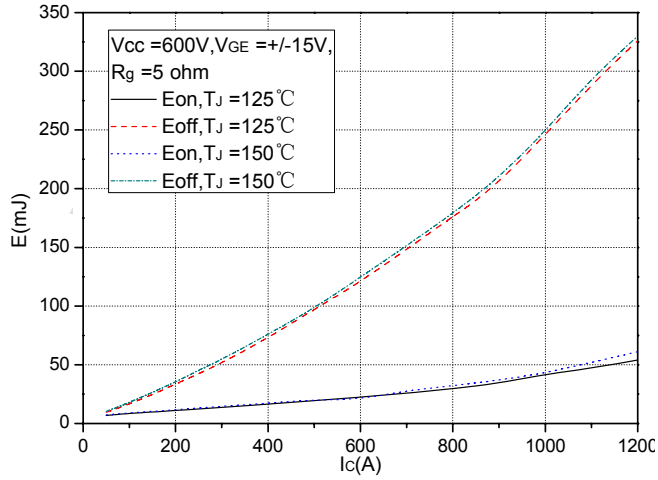


Fig.5 Typical Switching Loss vs. Collector Current

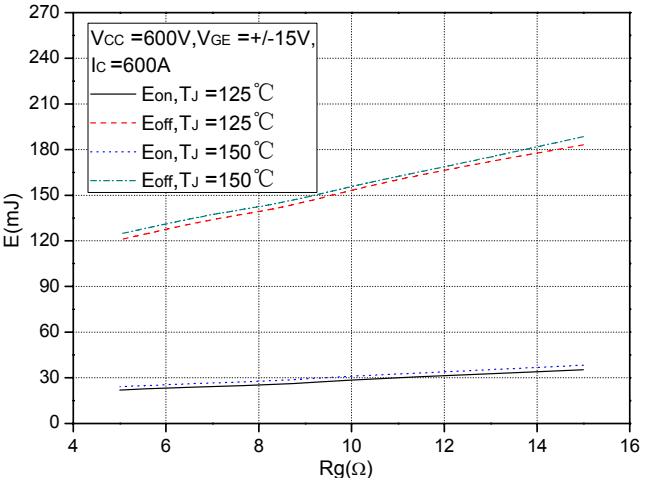


Fig.6 Typical Switching Loss vs. Gate Resistance

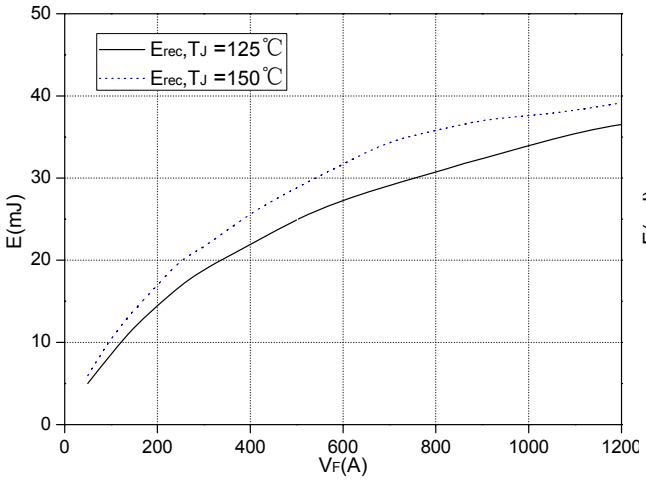


Fig.7 Typical Switching Loss vs. Collector Current

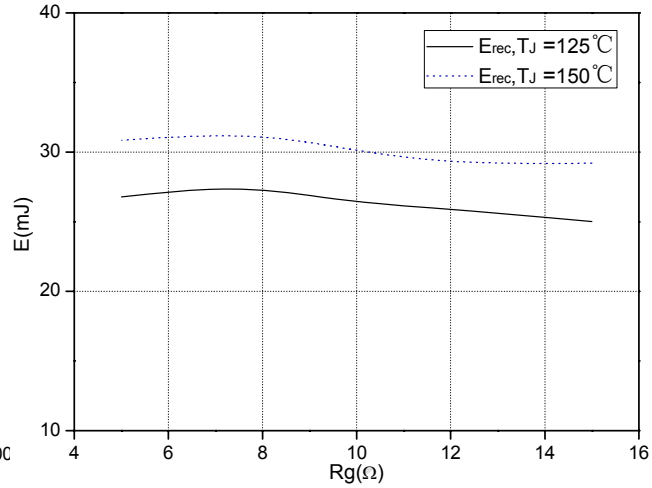


Fig.8 Typical Switching Loss vs. Gate Resistance

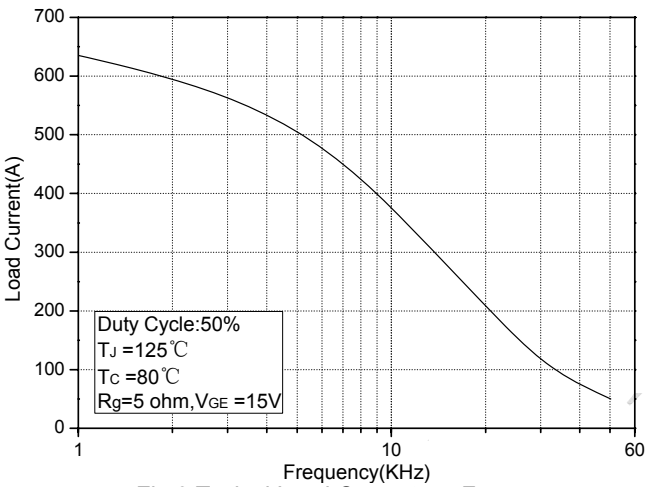


Fig.9 Typical Load Current vs. Frequency

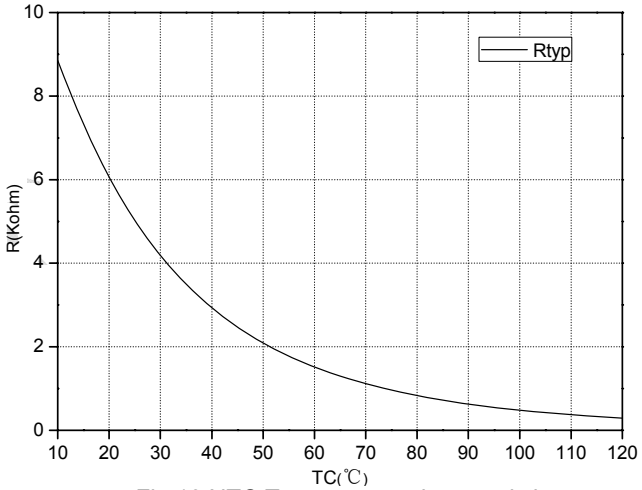


Fig.10 NTC Temperature characteristics

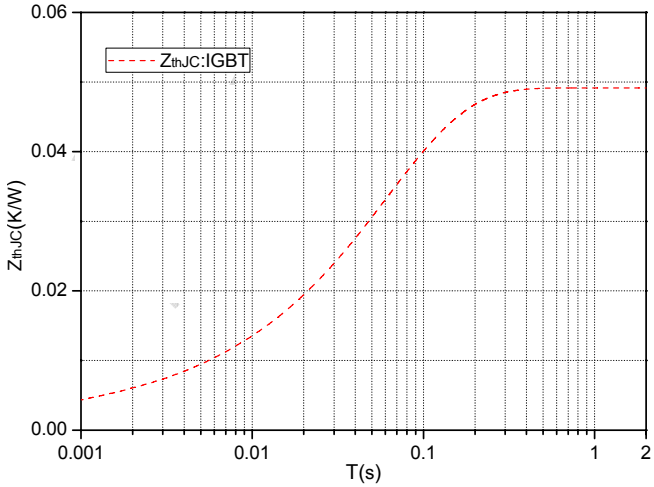


Fig.11 Transient thermal impedance (IGBT)

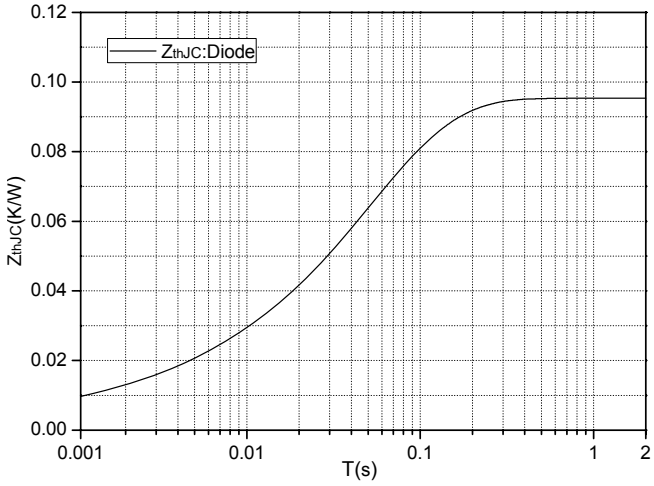


Fig.12 Transient thermal impedance (Diode)

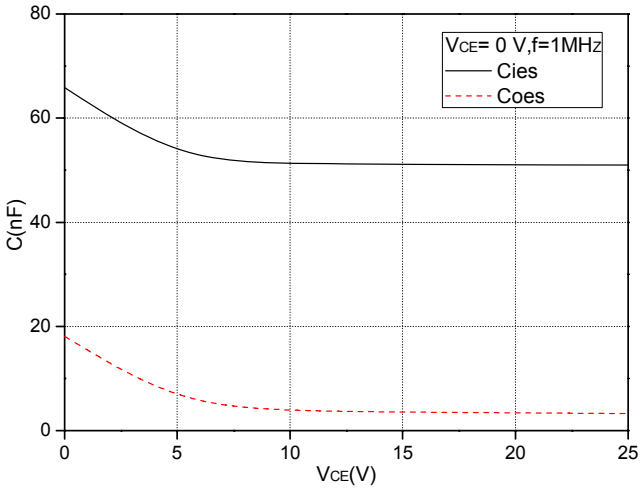
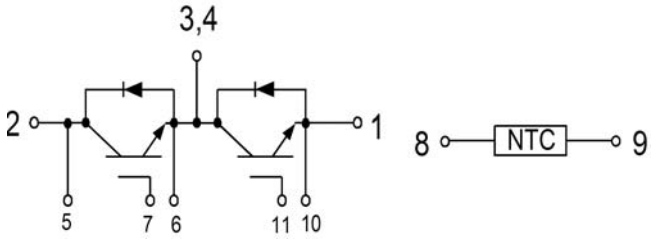


Fig.13 Capacitance Characteristics

Internal Circuit



Package Outline (Unit: mm):