SL450H120TL

IGBT Module

Features：

- Short Circuit Rated 10μs
- Low Saturation Voltage: $V_{CE\ (sat)}$ = 1.80V @ I_C = 450A , 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℃	450	A
		T_C = 25℃	800	A
I_{CM}	Repetitive Peak Collector Current	T_J = 175℃	900	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C = 25℃ T_{Jmax}=175℃	2080	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		4.5	5.5	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 450A, V_{GE} = 15V	T_J = 25℃		1.80	2.00	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			39.0		nF
C_{oes}	Output Capacitance				2.45		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 600V,I_C = 450A, R_G = 5 Ω,V_{GE} = ±15V, Inductive Load	T_J = 25℃		1175		ns
			T_J = 125℃		1160		
t_r	Rise Time		T_J = 25℃		360		ns
			T_J = 125℃		350		
$t_{d(off)}$	Turn-off Delay Time		T_J = 25℃		880		ns
			T_J = 125℃		920		
t_f	Fall Time		T_J = 25℃		260		ns
			T_J = 125℃		400		
E_{on}	Turn-on Switching Loss		T_J = 25℃		54.2		mJ
			T_J = 125℃		62.5		
E_{off}	Turn-off Switching Loss		T_J = 25℃		50.2		mJ
			T_J = 125℃		74.0		
Q_g	Total Gate Charge		T_J = 25℃		3800		nC
RBSOA	RBSOA	I_C=900A,V_{CC}=960V,Vp=1200V, Rg = 15Ω, V_{GE}=+15V to 0V, T_J =150°C		Trapezoid			
SCSOA	SCSOA	V_{CC} = 600V, V_{GE} = 15V, T_J = 150℃		10			μs
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case				0.07		℃/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	450	A
I_{FM}	Diode Maximum Forward Current	900	A

Electrical Characteristics of Diode

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F = 450A , V_{GE} = 0V	T_J = 25℃		2.20		V
			T_J = 125℃		2.40		
I_{rr}	Peak Reverse Recovery Current	I_F=450A, di/dt =1600A/μs, V_{rr} = 600V, V_{GE} = -15V	T_J = 25℃		120		A
			T_J = 125℃		170		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		16.5		μC
			T_J = 125℃		38.7		
E_{rec}	Reverse Recovery Energy		T_J = 25℃		6.2		mJ
			T_J = 125℃		13.9		
$R_{\theta JC}$	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

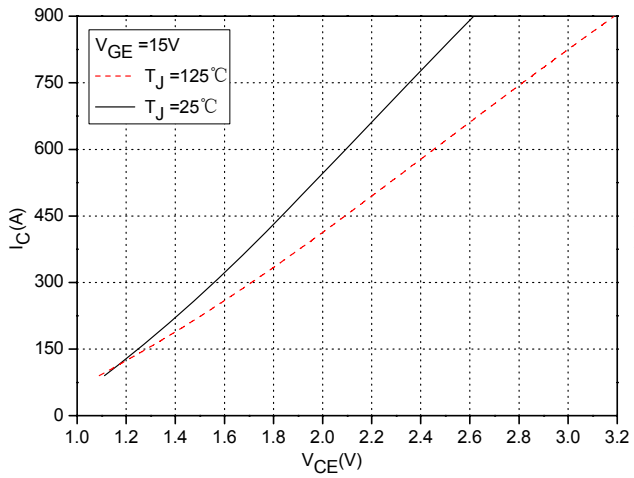


Fig.1 Typical Saturation Voltage Characteristics

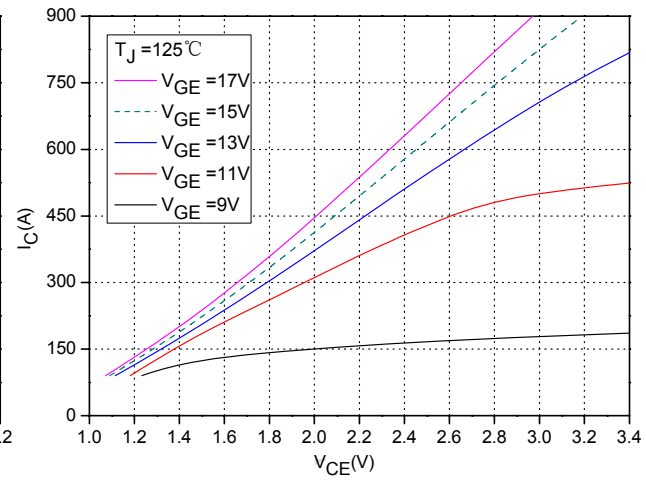


Fig.2 Typical Output Characteristics

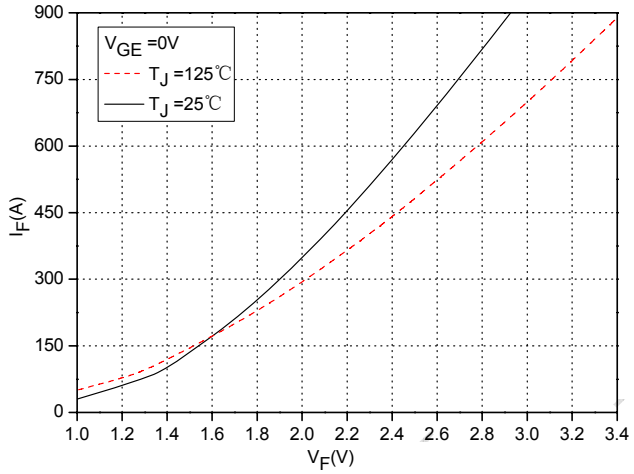


Fig.3 Forward Characteristics of Diode

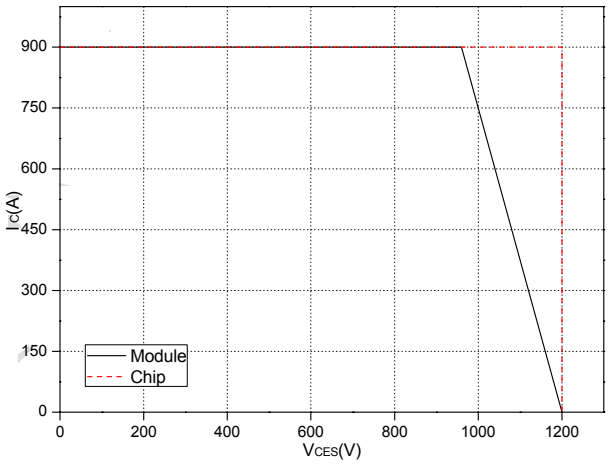


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

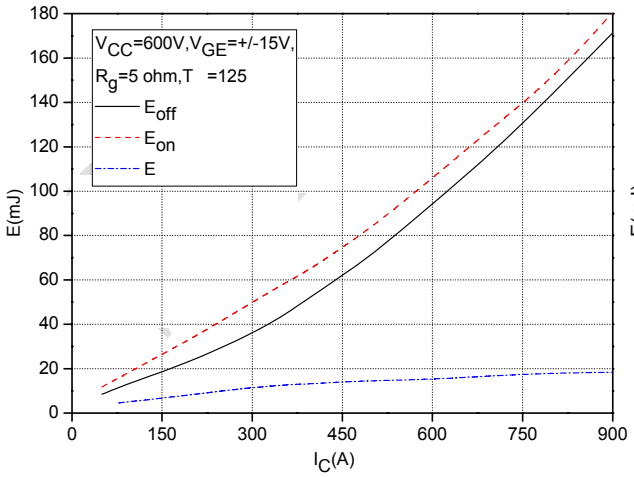


Fig.5 Typical Switching Loss vs. Collector Current

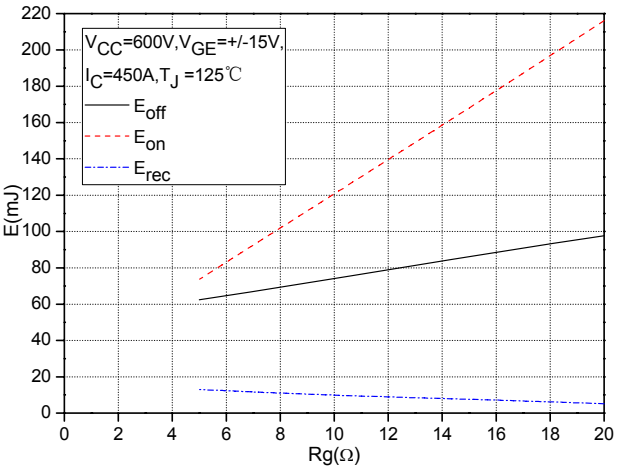


Fig.6 Typical Switching Loss vs. Gate Resistance

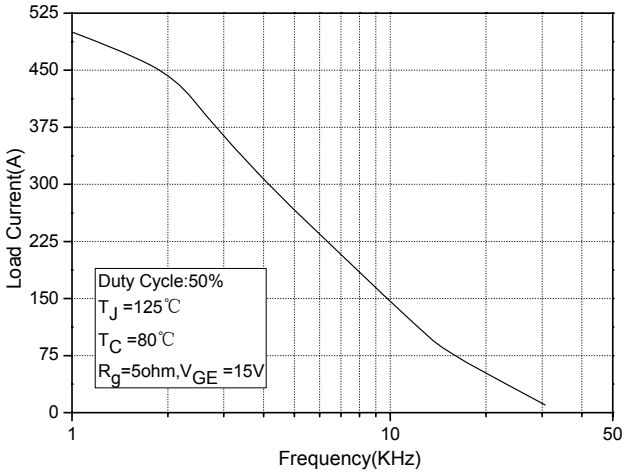


Fig.7 Typical Load Current vs. Frequency

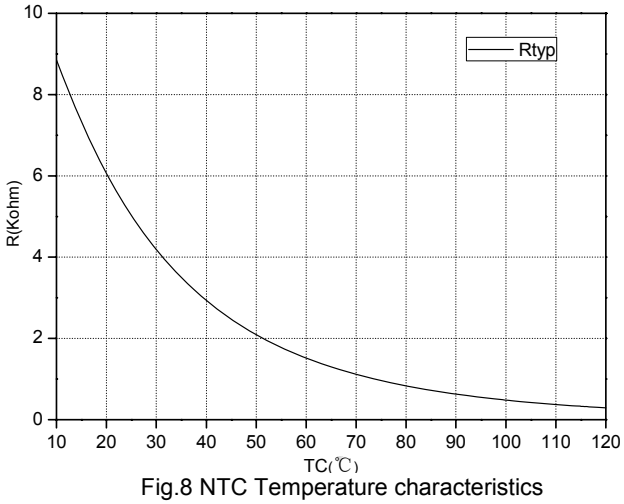


Fig.8 NTC Temperature characteristics

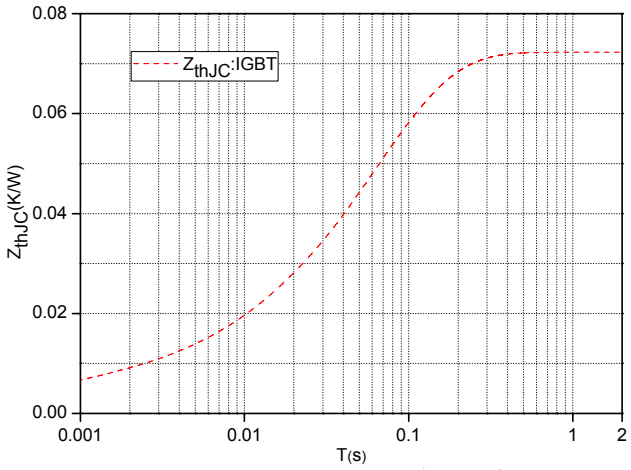


Fig.9 Transient thermal impedance (IGBT)

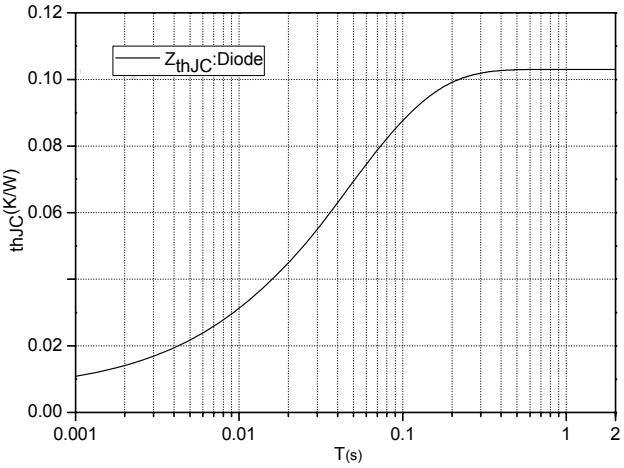


Fig.10 Transient thermal impedance (Diode)

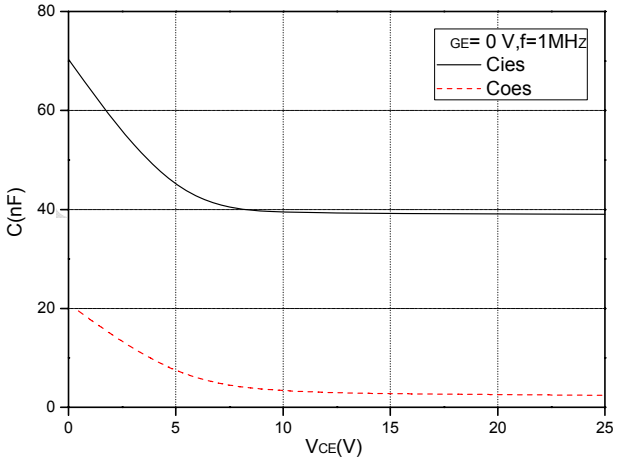
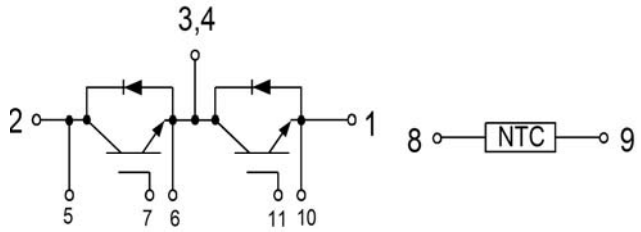


Fig.11 Capacitance Characteristics

Internal Circuit



Package Outline (Unit: mm):