

PTECQ80120LY

1200V 80A Si IGBT Discrete

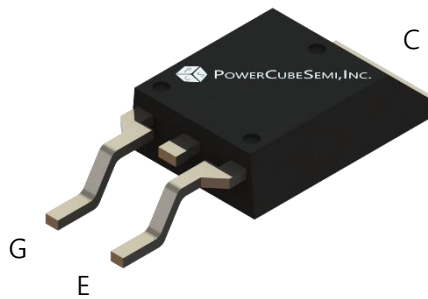
Features

Si IGBT Discrete

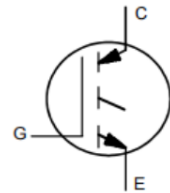
- Rated to 1200V at 80Amps @ $T_C = 100^\circ\text{C}$
- $V_{CE(sat)} = 1.75\text{V}$ @ $I_C = 80\text{A}$
- High breakdown voltage to 1200V for improved reliability
- Maximum Junction Temperature 175°C
- Positive temperature coefficient

Application

- PTC Heater



PKG type : STO-263



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit	
BV_{CES}	Collector-Emitter Breakdown Voltage	1200	V	
I_C	DC Collector Current	$T_C = 25^\circ\text{C}$	145	
		$T_C = 100^\circ\text{C}$	80	
$I_{C, Pulse}$	Pulsed Collector Current	240	A	
V_{GE}	Continuous Gate-Emitter Voltage	± 20	V	
V_{GE}	Transient Gate-Emitter Voltage	± 30		
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	735	W
T_{vj}	Operating Junction Temperature Range	-40 to 150	$^\circ\text{C}$	
T_{stg}	Storage Temperature Range	-55 to 150		



Package Marking and Ordering Information

Device Marking	Device	Package	Packing Method	Tape width	Quantity
PTECQ80120LY	PTECQ80120	STO-263	-	-	-

Electrical Characteristics

 $T_j=25^\circ\text{C}$ Unless Otherwise Specified

Static Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit	
			Min	Typ	Max		
BV_{CES}	Collector-Emitter Breakdown Voltage	$I_C=250\mu\text{A}$, $V_{GE}=0\text{V}$	1200	-	-	V	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=80\text{A}$, $V_{GE}=15\text{V}$	$T_j=25^\circ\text{C}$	-	1.75	2.30	V
			$T_j=125^\circ\text{C}$	-	2.15	-	
			$T_j=150^\circ\text{C}$	-	2.25	-	
$V_{GE(TH)}$	Gate-Emitter Threshold Voltage	$V_{CE}=V_{GE}$, $I_C=2.6\text{mA}$	5.5	6.0	6.7	V	
I_{CES}	Zero Gate Voltage Collector Current	$V_{CE}=1200\text{V}$, $V_{GE}=0\text{V}$	$T_j=25^\circ\text{C}$	-	-	0.25	mA
			$T_j=150^\circ\text{C}$	-	-	1.00	
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=\pm 20\text{V}$, $V_{CE}=0\text{V}$	-	-	100	nA	

Dynamic Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ	Max	
Q_G	Total Gate Charge	$V_{CC}=960\text{V}$, $I_C=80\text{A}$, $V_{GE}=15\text{V}$	-	0.65	-	μC
C_{IES}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$	-	7.94	-	nF
C_{RES}	Reverse Transfer Capacitance		-	0.19	-	



Electrical Characteristics

$T_J=25^{\circ}\text{C}$ Unless Otherwise Specified

Switching Characteristics

Symbol	Parameter	Test Condition		Numerical			Unit
				Min	Typ	Max	
$t_{d(\text{on})}$	Turn-On Delay Time	$V_{GE}=-5\sim 15\text{V},$ $V_{CC}=600\text{V},$ $I_C=80\text{A}, R_G=10\Omega$	$T_J=25^{\circ}\text{C}$ $T_J=125^{\circ}\text{C}$ $T_J=150^{\circ}\text{C}$	-	33	-	ns
				-	30	-	
				-	28	-	
t_r	Turn-On Rise Time			-	85	-	
				-	79	-	
				-	74	-	
$t_{d(\text{off})}$	Turn-Off Delay Time			-	231	-	mJ
				-	243	-	
				-	252	-	
t_f	Turn-Off Fall Time	-	174	-			
		-	263	-			
		-	325	-			
E_{on}	Turn-On Switching Energy	-	7.5	-			
		-	7.8	-			
		-	8.0	-			
E_{off}	Turn-Off Switching Energy	-	4.6	-			
		-	5.5	-			
		-	6.2	-			

Thermal Characteristics

Symbol	Parameter	Numerical	Unit
$R_{\theta(J-A)}$	Thermal Resistance Junction-to-Ambient	62	K/W
$R_{\theta(J-C)}$	Thermal Resistance Junction-to-Case for IGBT	0.17	

Typical Characteristics

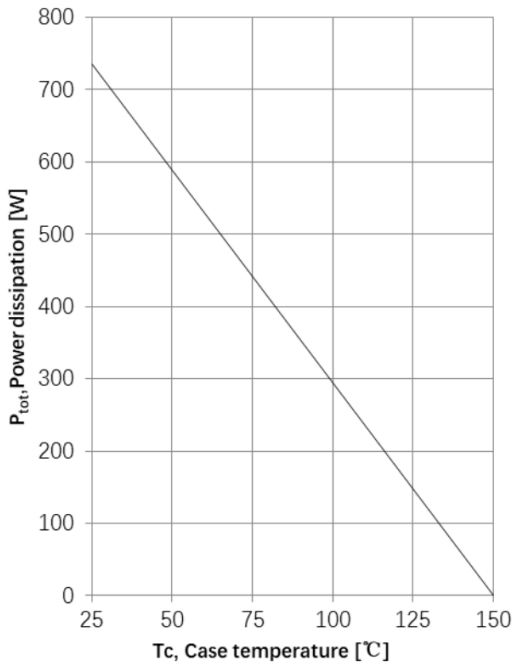


Figure 1. Power dissipation as a function of case temperature ($T_J \leq 175^\circ\text{C}$)

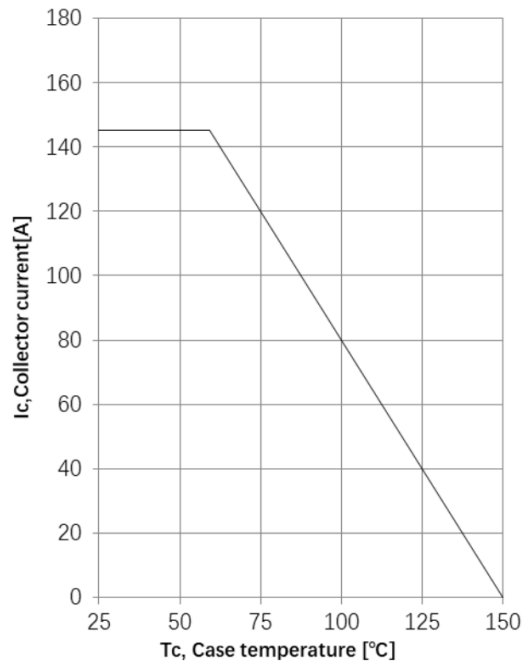


Figure 2. Collector current as a function of case temperature ($V_{GE} \geq 15\text{V}$, $T_J \leq 175^\circ\text{C}$)

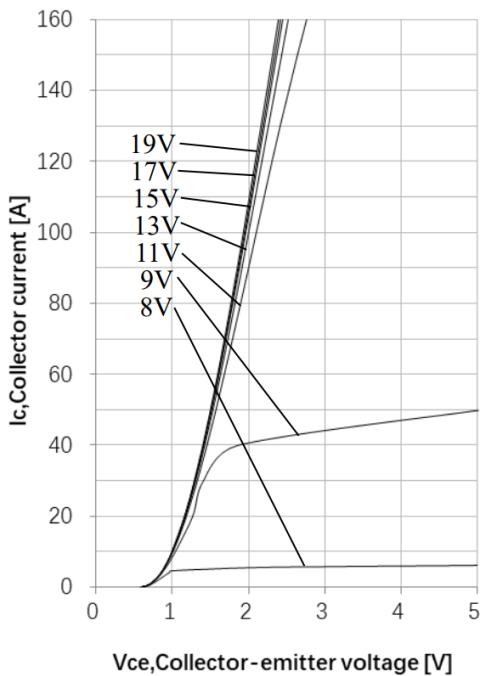


Figure 3. Output Characteristics ($T_J = 25^\circ\text{C}$)

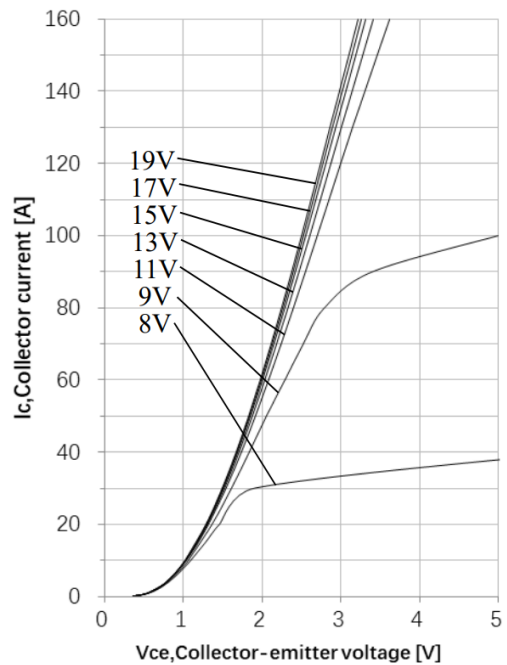


Figure 4. Output Characteristics ($T_J = 150^\circ\text{C}$)

Typical Characteristics

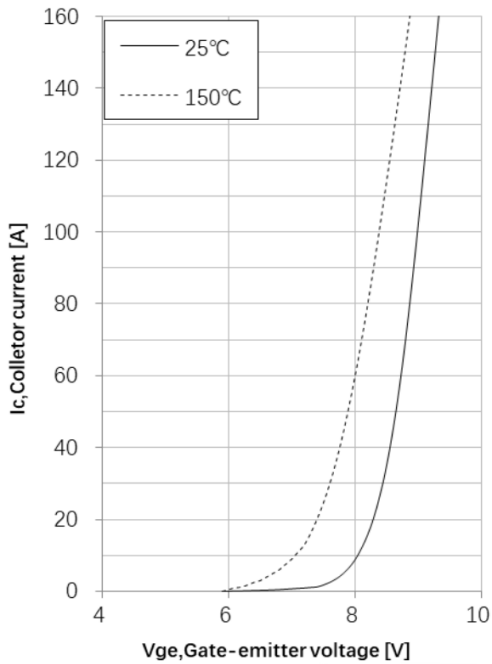


Figure 5. Typical transfer characteristic ($V_{CE}=20V$)

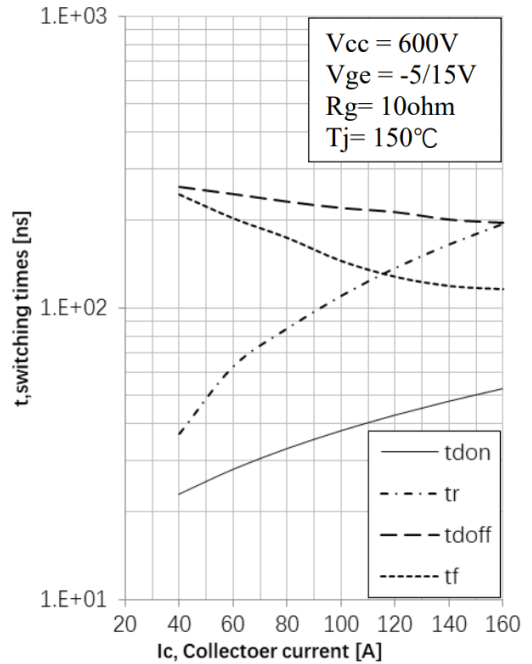


Figure 6. Typical Switching time as a function of collector current

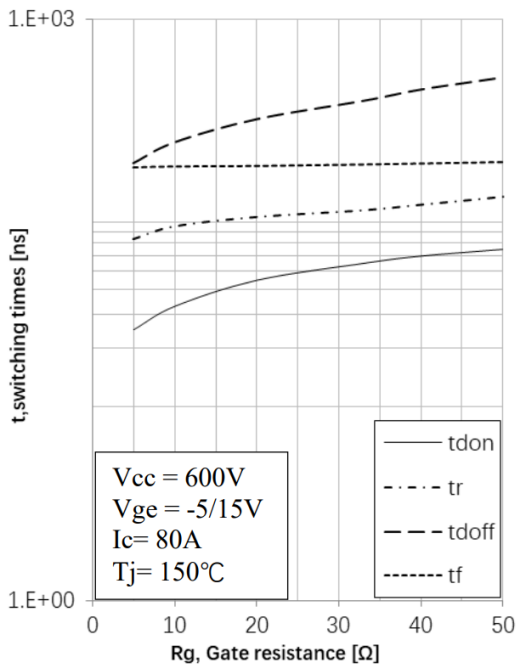


Figure 7. Typical Switching times as a function of gate resistance

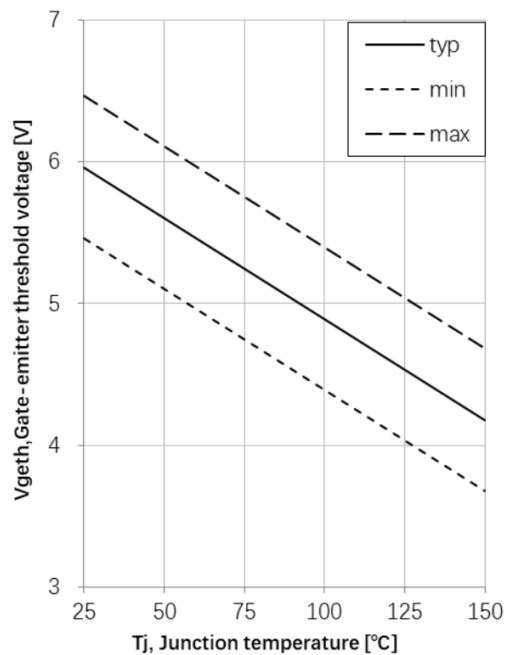


Figure 8. Gate-Emitter threshold voltage as a function of junction temperature ($I_C=2.6mA$)

Typical Characteristics

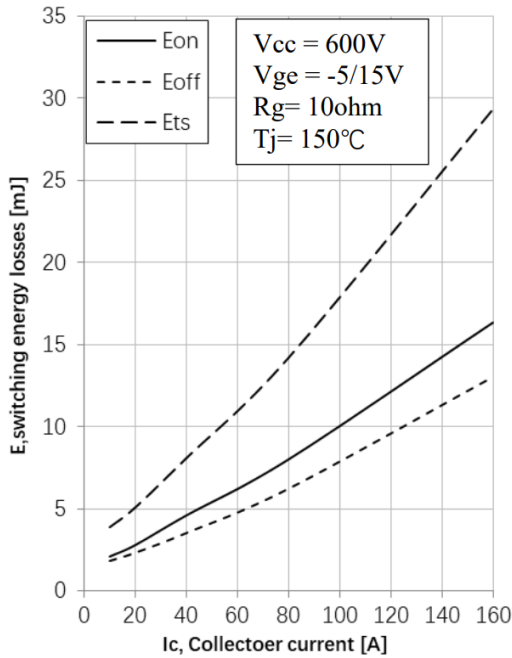


Figure 9. Typical Switching energy losses as a function of collector current

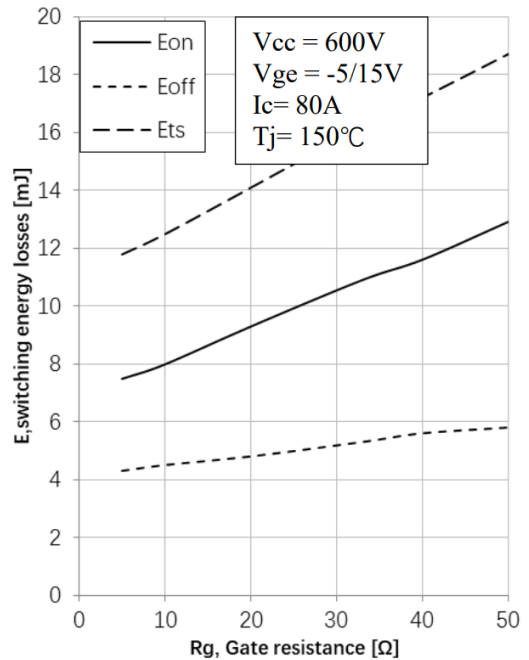


Figure 10. Typical Switching energy losses as a function of gate resistance

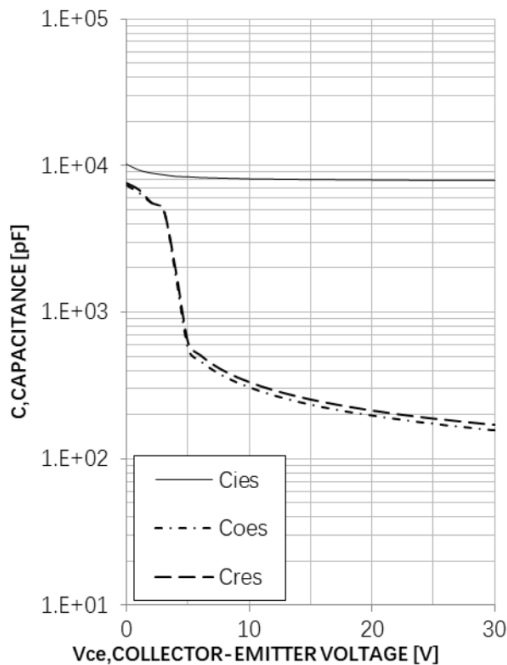


Figure 11. Typical capacitance as a function of collector-emitter voltage

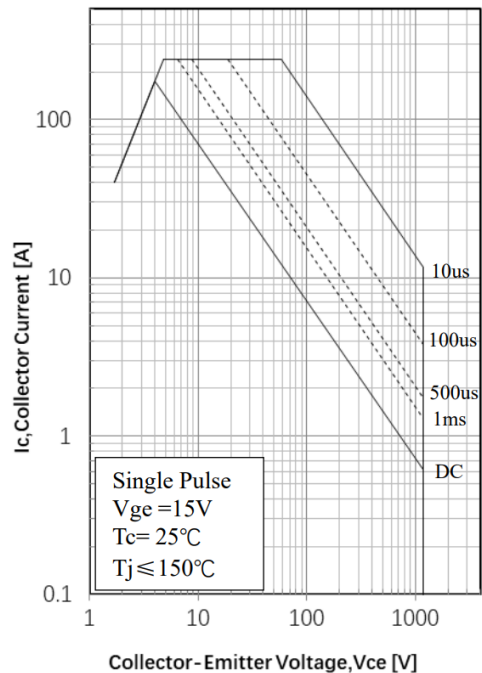


Figure 12. Safe operating area

Typical Characteristics

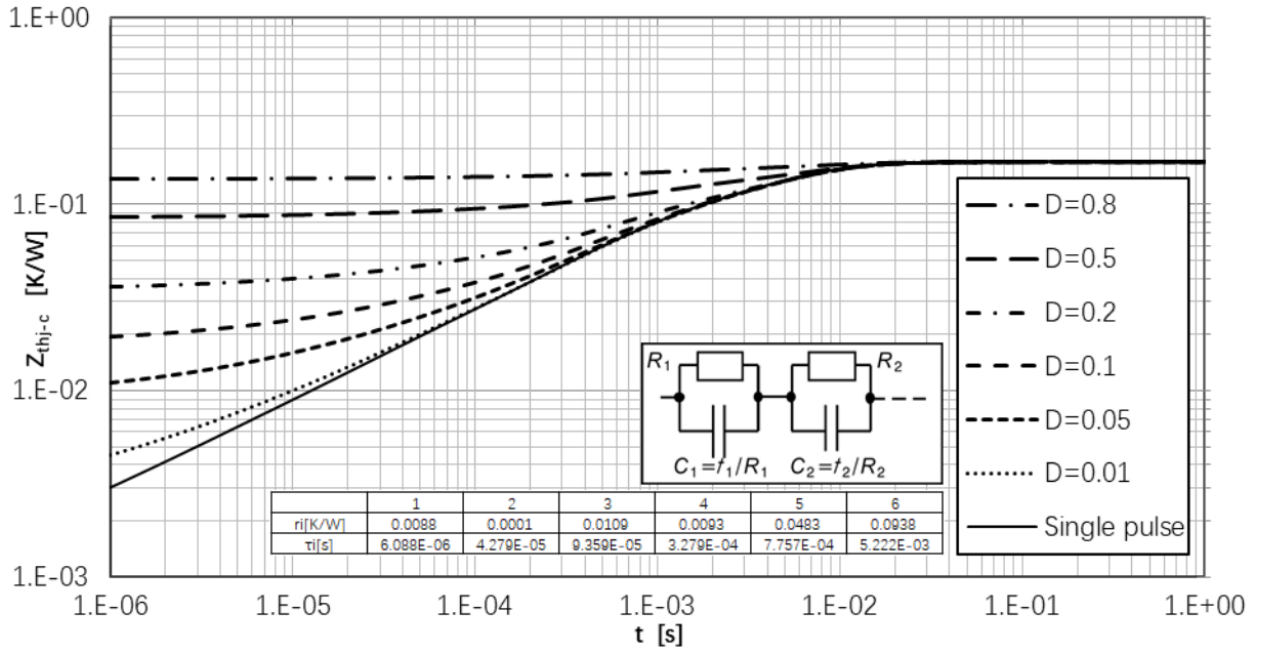
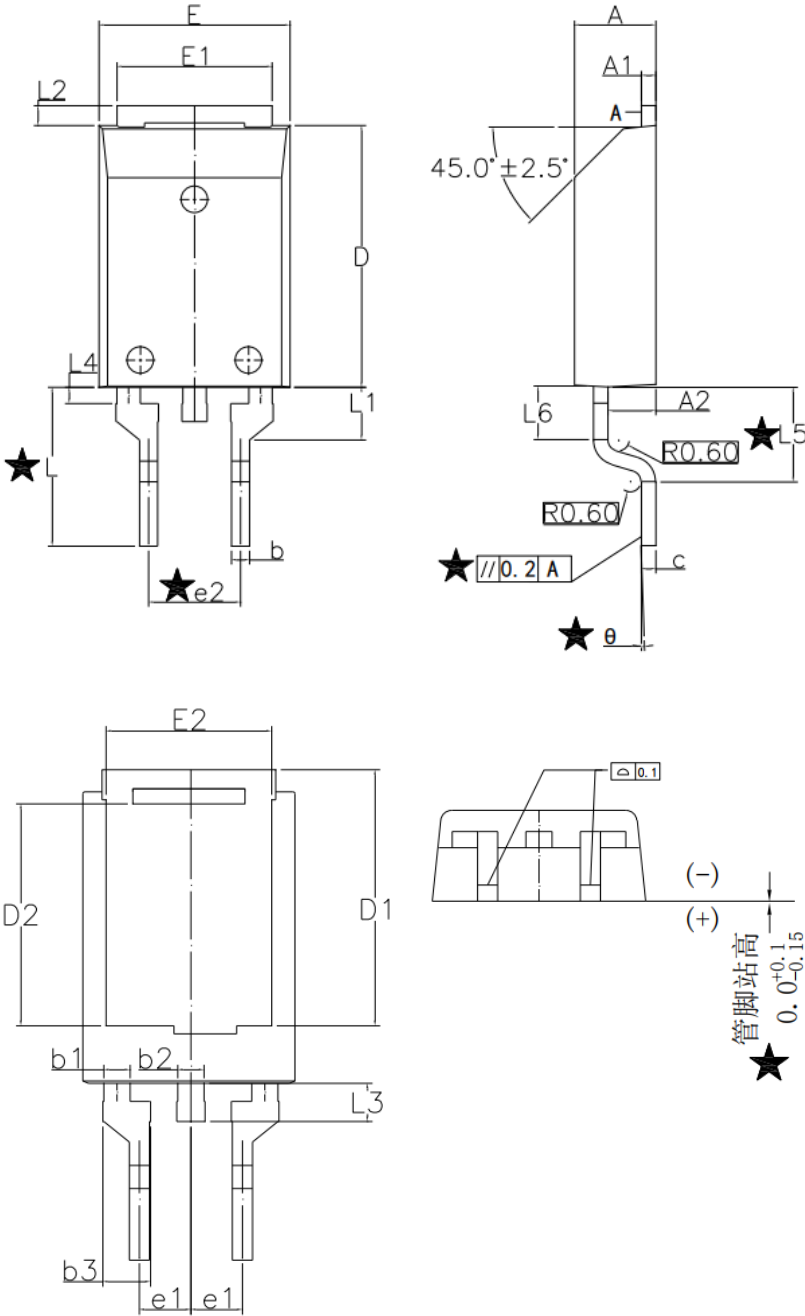


Figure 13. IGBT Transient Thermal Impedance



Package Outline

Unit : mm



SYMBOL	DIMENSIONS	
	MIN	MAX
A	4.34	4.74
A1	0.70	1.00
A2	2.50	3.00
b	0.70	1.30
b1	1.25	1.65
b2	1.25	1.65
b3	2.16	2.36
c	0.70	1.00
D	14.00	15.00
D1	12.50	13.50
D2	10.54	11.54
E	10.00	11.00
E1	8.00	9.00
E2	7.70	8.70
e1	2.55 BSC	
e2	4.90	5.30
L	8.50	8.90
L1	2.65	3.15
L2	0.50	1.50
L3	1.40	2.40
L4	-	1.50
L5	5.05	5.45
L6	2.97 BSC	
θ	-2°	2°
//	-	0.2
∩	-	0.1

管脚站高
 $0.0^{+0.1}_{-0.15}$