SSC65T50GT6

Trench FSII Fast IGBT

➢ Features

V_{CES}	V_{GES}	I_C
650V	±20V	80A@25℃
		50A@100℃

➢ Description

Using trench design and advanced FS (Field Stop) second generation technology, the 650V Trench FSII IGBT offers superior conduction and switching performances, and easy parallel operation.

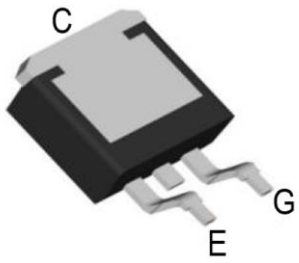
➢ Applications

- Welding Machines
- PFC Circuits
- UPS
- Power Inverters

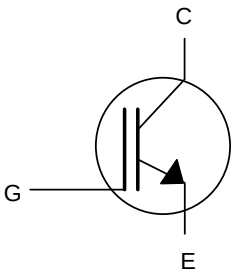
➢ Ordering Information

Device	Package	Shipping
SSC65T50GT6	TO-263-3L	50/Tube
Minimum Purchase Quantity: 1K/Box		

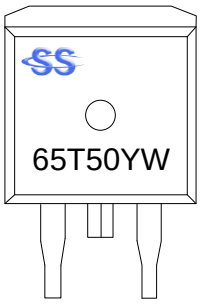
➢ Pin Configuration



TO-263-3L (Bottom View)



Pin Configuration



Marking

(YW: Internal Traceability Code)

➢ Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Symbol	Parameter		Ratings	Unit
V_{CES}	Collector-Emitter Voltage		650	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Collector Current	T_C=25℃	80	A
		T_C=100℃	50	
I_{Cpuls}	Pulsed Collector Current, t_p limited by T_{Jmax}		150	A
-	Turn off safe operating area, V_{CE} = 1200V,T_J = 150℃		150	A
P_D	Power Dissipation [a]	T_A=25℃	266	W
		T_A=70℃	170	
T_J	Operating Junction and Storage Temperature Range		-55~150	℃
T_{STG}	Operating Junction and Storage Temperature Range		-55~150	℃
T_L	Maximum Temperature for Soldering		260	℃

➢ Thermal Resistance Ratings (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance	50	℃/W
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	0.47	

Note:

a. The maximum current rating is package limited.

➢ Electrical Characteristics (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	V_{GE} = 0V, I_C = 0.25mA	650			V
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V, V_{CE}=650V, T_J=25℃			1	uA
		V_{GE}=0V, V_{CE}=650V, T_J=150℃		5	100	uA
$I_{GES(F)}$	Gate to Emitter Forward Leakage	V_{GE} = +20V, V_{CE} = 0V			100	nA
$I_{GES(R)}$	Gate to Emitter Reverse Leakage	V_{GE} = -20V, V_{CE} = 0V			-100	nA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=50A, V_{GE}=15V, T_J=25℃		1.6		V
		I_C=50A, V_{GE}=15V, T_J=125℃		1.9		V
		I_C=50A, V_{GE}=15V, T_J=150℃		2.0		V
$V_{GE(th)}$	Gate Threshold Voltage	I_C = 1mA, V_{CE} = V_{GE}	4	5	6	V
G_{FS}	Transconductance	V_{CE} = 20V, I_C = 50A		26		S
C_{ies}	Input Capacitance	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz, T_J = 25℃		1701		pF
C_{oes}	Output Capacitance			117		
C_{res}	Reverse Transfer Capacitance			101		
$T_{D(ON)}$	Turn-on delay time	T_J=25℃, V_{CC}=400V, I_C=50A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		19		ns
T_r	Rise time			38		
$T_{D(OFF)}$	Turn-off delay time			249		
T_f	Fall time			56		
E_{on}	Turn-On Switching Loss			1.34		mJ
E_{off}	Turn-Off Switching Loss			1.49		
E_{ts}	Total Switching Loss			2.83		
$T_{D(ON)}$	Turn-on delay time	T_J=150℃, V_{CC}=400V, I_C=50A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		18		ns
T_r	Rise time			43		
$T_{D(OFF)}$	Turn-off delay time			265		
T_f	Fall time			85		
E_{on}	Turn-On Switching Loss			1.53		mJ
E_{off}	Turn-Off Switching Loss			1.72		
E_{ts}	Total Switching Loss			3.25		
Q_G	Total Gate Charge	V_{CC} = 300V, I_C = 50A, V_{GE} = 0/15V		158		nC
Q_{GE}	Gate to Emitter Charge			13		
Q_{GC}	Gate to Collector Charge			32		

➢ Typical Performance Characteristics (T_A=25℃ unless otherwise noted)

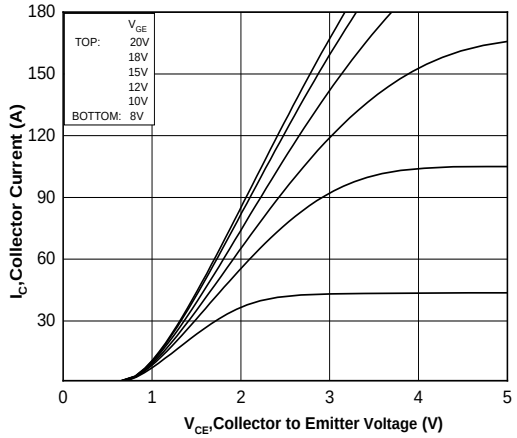


Figure 1. Output Characteristics(T_J=25℃)

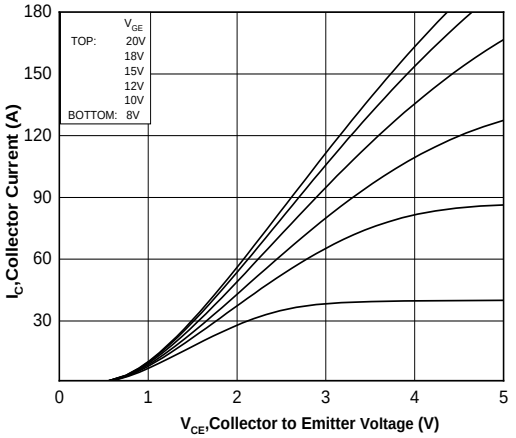


Figure 2. Output Characteristics(T_J=150℃)

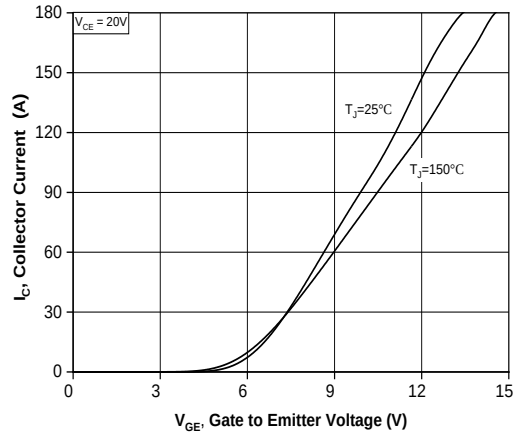


Figure 3. Typical transfer characteristic (T_J=25℃)

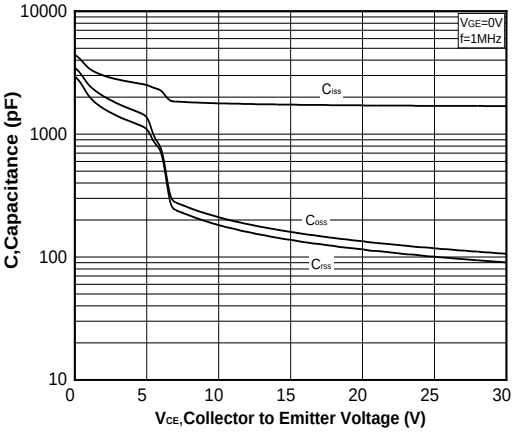


Figure 4. Capacitance characteristic (V_{GE}=0V, f=1MHz)

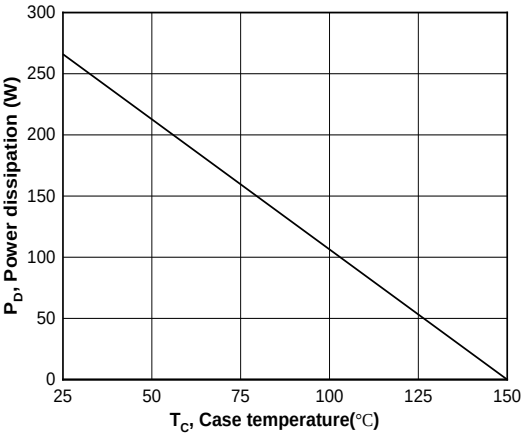


Figure 5. Power dissipation as a function of case temperature (T_J≤175℃)

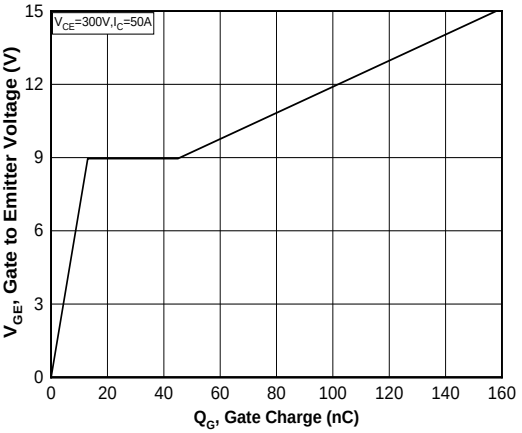


Figure 6. Typical gate charge (I_C=50A)

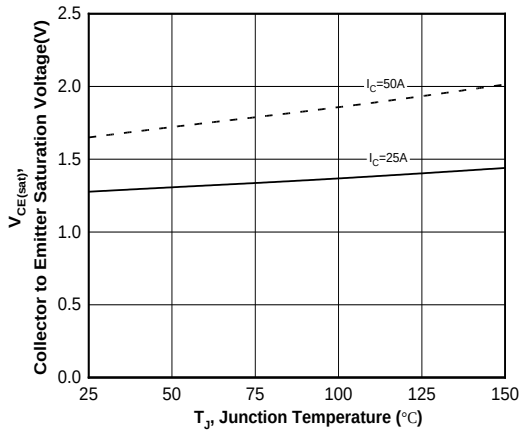


Figure 7. $V_{CE(SAT)}$ as a function of junction temperature (V_{GE}=15V)

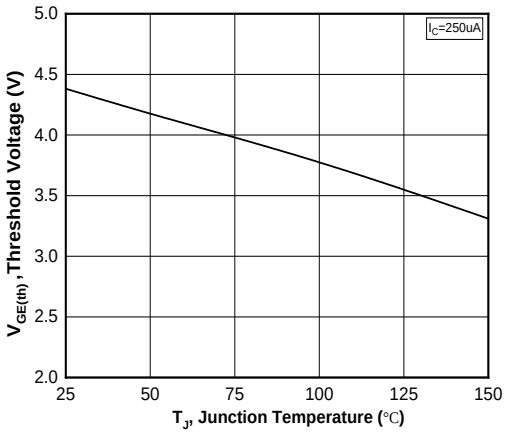


Figure 8. $V_{GE(TH)}$ as a function of junction temperature (I_{CE}=250μA)

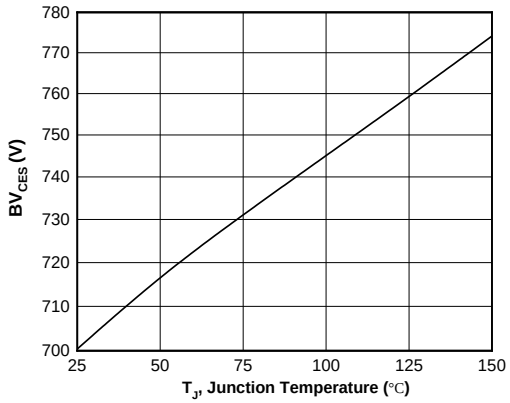


Figure 9. BV_{CES} as a function of junction temperature (I_{CE}=250μA)

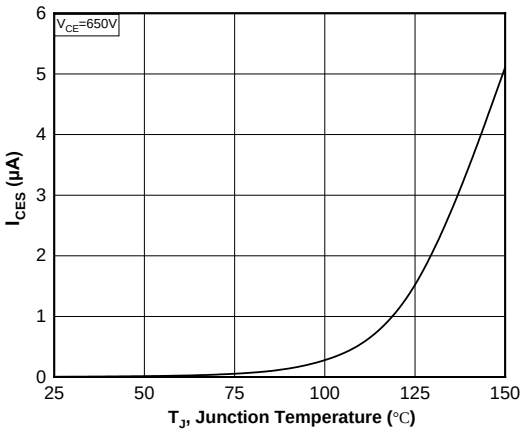


Figure 10. I_{CES} leakage current as a function of junction temperature

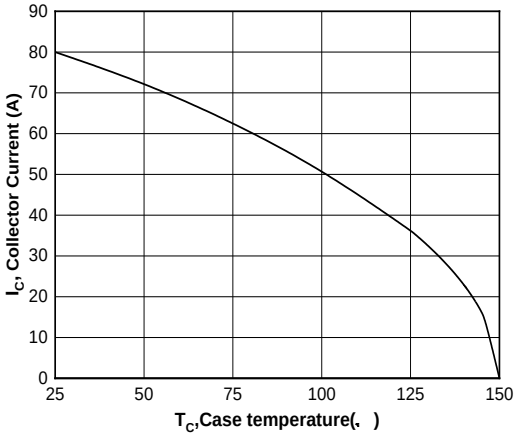


Figure 11. Collector current as a function of case temperature(V_{GE}≥15V,T_J≤150℃)

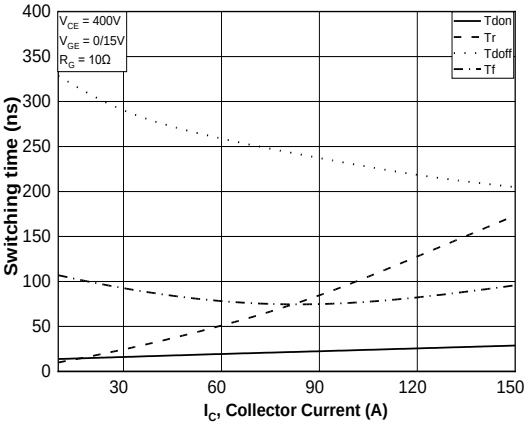


Figure 12. Typical switching times as a function of collector current (T_J=150℃, V_{CC}=400V, $RG_{(on)}$=$RG_{(off)}$=10Ω)

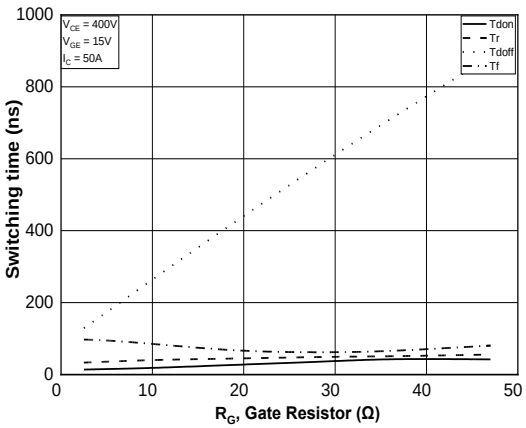


Figure 13. Typical switching times as a function of gate resistance (T_J=150℃, V_{CC}=400V, I_C=50A)

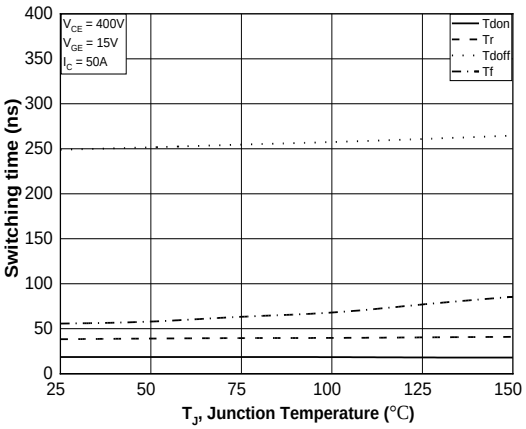


Figure 14. Typical switching times as a function of junction temperature (V_{CE}=400V, I_C=50A, $R_{G(on)}$=$R_{G(off)}$=10Ω)

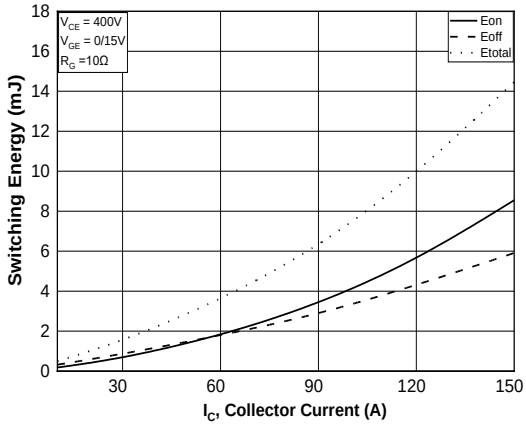


Figure 15. E_{on}, E_{off} as a function of I_C (T_J=25℃)

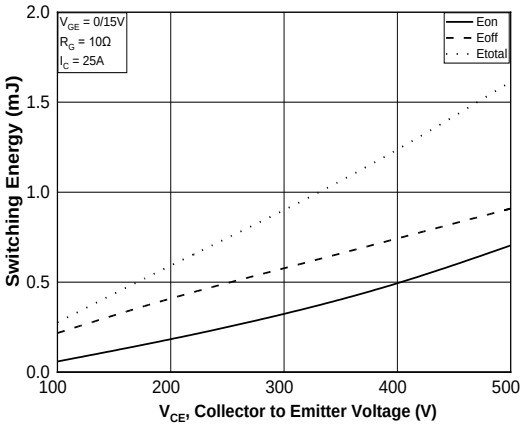


Figure 16. E_{on}, E_{off} as a function of V_{CE} (T_J=25℃)

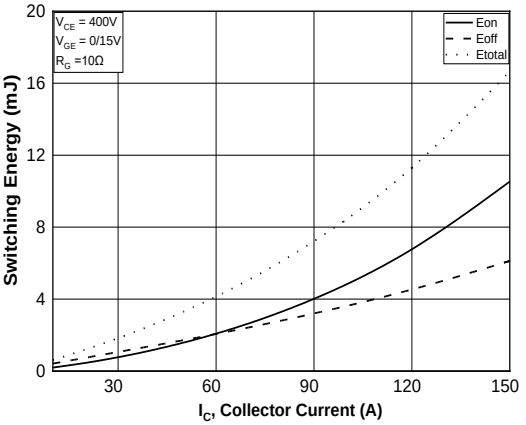


Figure 17. E_{on}, E_{off} as a function of I_C (T_J=150℃)

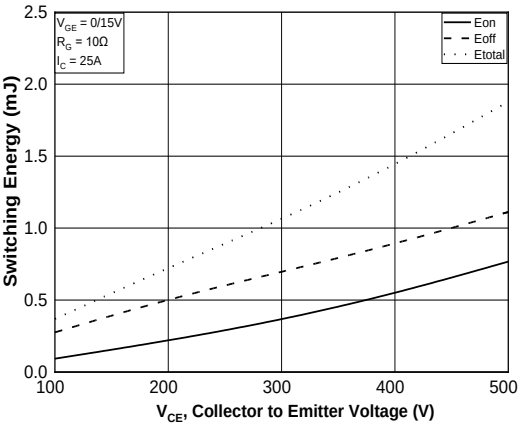


Figure 18. E_{on}, E_{off} as a function of V_{CE} (T_J=150℃)

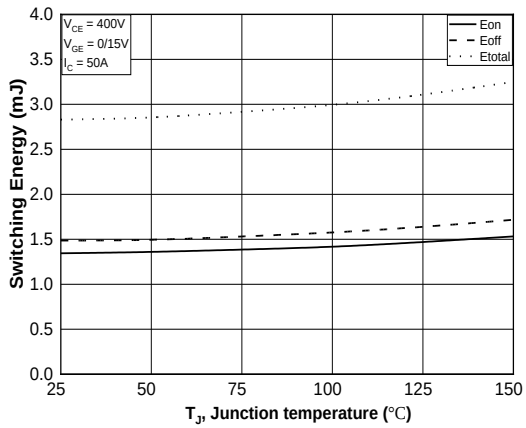


Figure 19. E_{on},E_{off} as a function of junction temperature

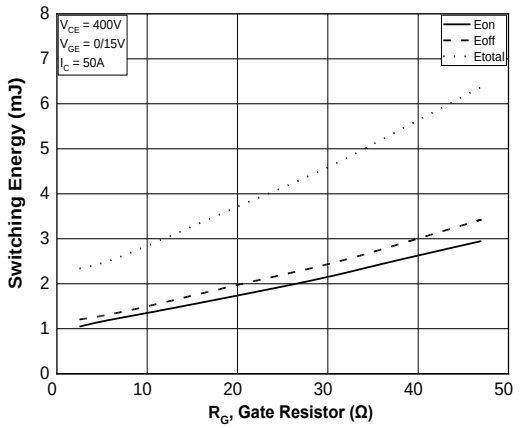


Figure 20. E_{on},E_{off} as a function of gate resistance (T_J=25 ℃)

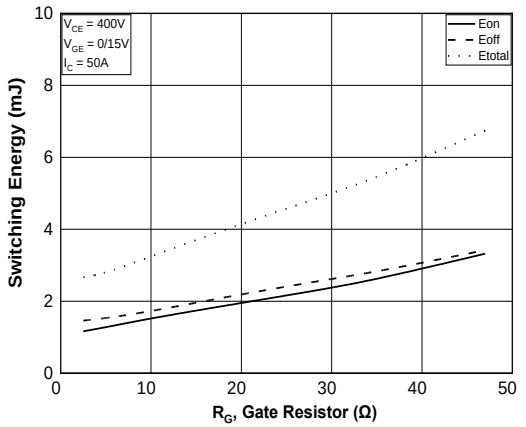


Figure 21. E_{on},E_{off} as a function of gate resistance (T_J=150 ℃)

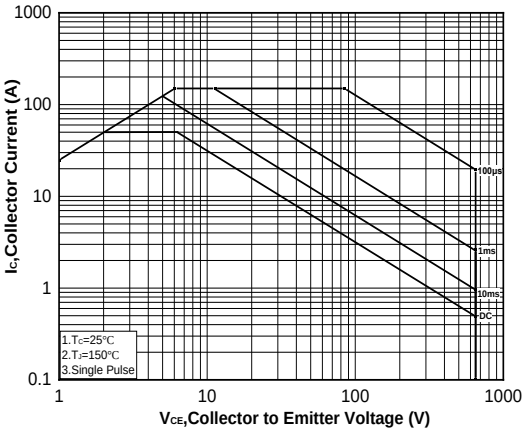
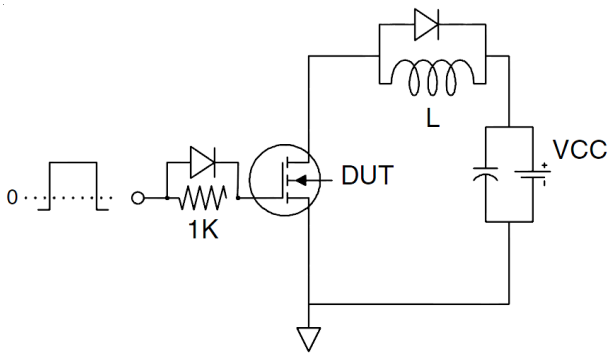


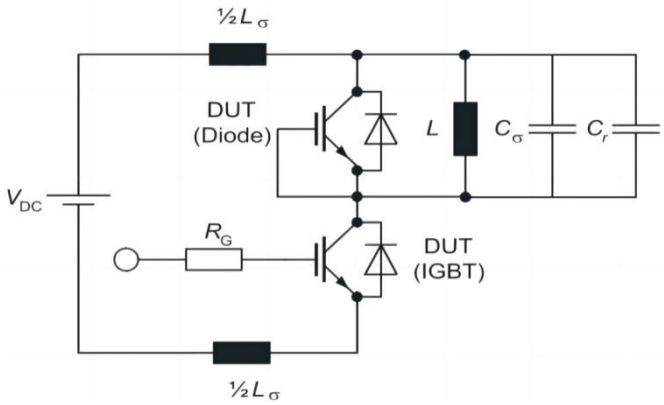
Figure 22. Forward bias safe operating area

➢ Test Circuit

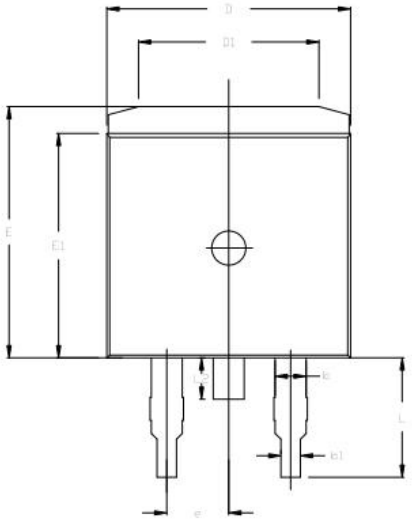
(1) Gate Charge Test Circuit



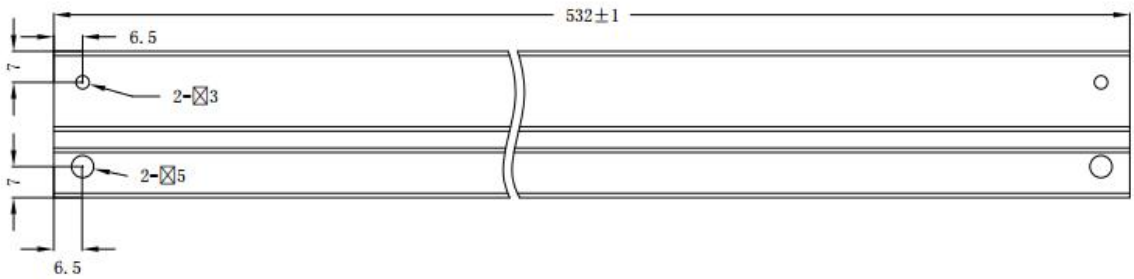
(2) Switch Time Test Circuit



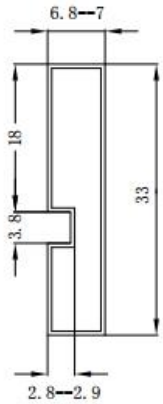
➢ Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.40	--	4.60
b	1.20	--	1.36
b1	0.70	--	0.90
C	0.48	--	0.53
C1	1.28	--	1.32
C2	0.04	0.12	0.20
D	9.80	10.00	10.20
D1	7.25	7.40	7.55
E	10.20	10.30	10.40
E1	9.10	9.20	9.30
e	--	2.54	--
L	4.70	4.90	5.10
L1	2.40	2.60	2.80
L2	1.50	1.70	1.90



T=0.5 ±0.1



技术要求：
1. 材料：透明PVC
2. 表面电阻：10E5~10E10 OHMS/SQ
3. 未注尺寸公差±0.3
4. 黑色钉子由厂家出货时塞于左端

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