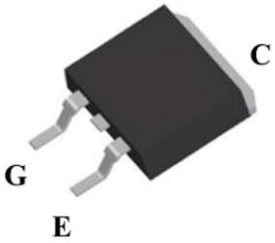
SSC65TR10GT6

Trench FSII Fast IGBT

➢ Features

V_{CES}	V_{GES}	I_C
650V	±20V	20A@25℃
		10A@100℃

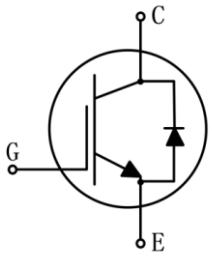
➢ Pin Configuration



TO263-3L (Top View)

➢ Description

- High ruggedness performance
- 10μs short circuit capability
- High efficiency for motor control
- Excellent current sharing in parallel operation
- RoHS compliant



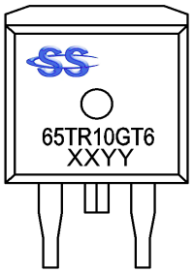
Pin Configuration

➢ Applications

- Home appliances
- Motordrives

➢ Ordering Information

Device	Package	Shipping
SSC65TR10GT6	TO263-3L	800/Reel



Marking

(XXYY: Internal Traceability Code)

➢ Absolute Maximum Ratings (T_{vj}=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℃	20	A
		T_C=100℃	10	
I_{Cpuls}	Pulsed Collector Current, t_p limited by T_{vJmax}		40	A
P_D	Power Dissipation[a]	T_C=25℃	100	W
		T_C=100℃	50	
T_J	Operating Junction and Storage Temperature Range		-40~175	℃
T_{STG}	Operating Junction and Storage Temperature Range		-55~150	℃
t_{sc}	Short circuit withstand time		10	us

➢ Thermal Resistance Ratings

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance		60	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case for IGBT		1.5	
$R_{\theta JC}$	Thermal Resistance, Junction to Case for Diode		1.8	

Note:

a. The maximum current rating is package limited.

➢ Electrical Characteristics of IGBT (T_{vj}=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, Tvj=25℃			50	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=10A, V_{GE}=15V, T_{vj}=25℃		1.8		V
		I_C=10A, V_{GE}=15V, T_{vj}=175℃		2.3		V
$V_{GE(th)}$	Gate Threshold Voltage	I_C = 250uA, V_{CE} = V_{GE}	5.5	5.8	6.2	V
C_{ies}	Input Capacitance	V_{CE} = 30V, V_{GE} = 0V, f = 1MHz		670		pF
C_{oes}	Output Capacitance			37		
C_{res}	Reverse Transfer Capacitance			10		
$T_{D(ON)}$	Turn-on delay time	T_{vj}=25℃, V_{CC}=400V, I_C=10A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		12		ns
T_r	Rise time			11		
$T_{D(OFF)}$	Turn-off delay time			74		
T_f	Fall time			71		
E_{on}	Turn-On Switching Loss			0.18		mJ
E_{off}	Turn-Off Switching Loss			0.17		
E_{ts}	Total Switching Loss			0.35		
$T_{D(ON)}$	Turn-on delay time	T_{vj}=175℃, V_{CC}=400V, I_C=10A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		11		ns
T_r	Rise time			13		
$T_{D(OFF)}$	Turn-off delay time			114		
T_f	Fall time			87		
E_{on}	Turn-On Switching Loss			0.22		mJ
E_{off}	Turn-Off Switching Loss			0.27		
E_{ts}	Total Switching Loss			0.49		
Q_G	Total Gate Charge	V_{CC} = 520V, I_C = 10A, V_{GE} = 0/15V		28		nC

➢ Electrical Characteristics of Diode (T_{vj}=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VF	Diode forward voltage	IF=10A, T_{vj}=25℃		1.4		V
		IF=10A, T_{vj}=175℃		1.2		V
Trr	Diode reverse recovery time	VR=400V IF=10A diF/dt=750A/μs T_{vj}=25℃		57		ns
Irrm	Diode peak reverse recovery current			12		A
Qrr	Diode reverse recovery charge			411		nC
Trr	Diode reverse recovery time	VR=400V IF=10A diF/dt=750A/μs T_{vj}=175℃		124		ns
Irrm	Diode peak reverse recovery current			13		A
Qrr	Diode reverse recovery charge			737		nC

➢ Typical Performance Characteristics (T_{vj}=25℃ unless otherwise noted)

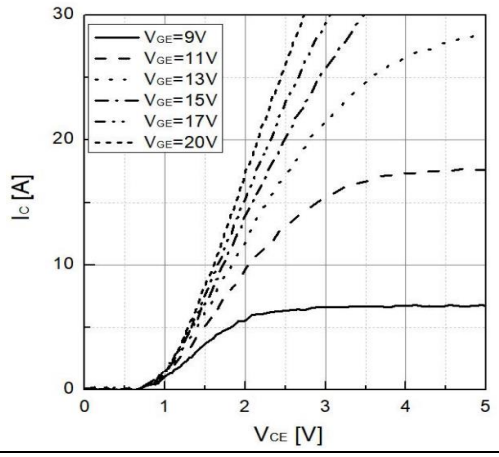


Fig 1. Typical output characteristic (T_{vj}=25℃)

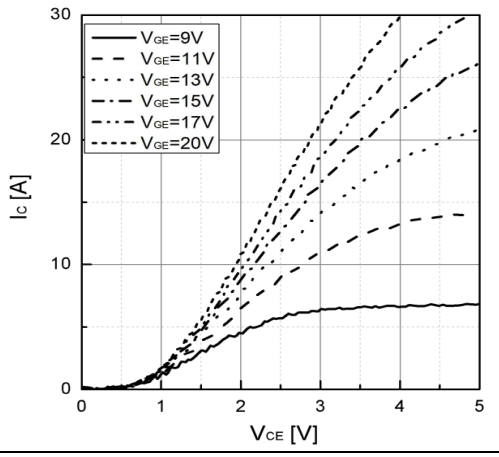


Fig 2. Typical output characteristic(T_{vj}=150℃)

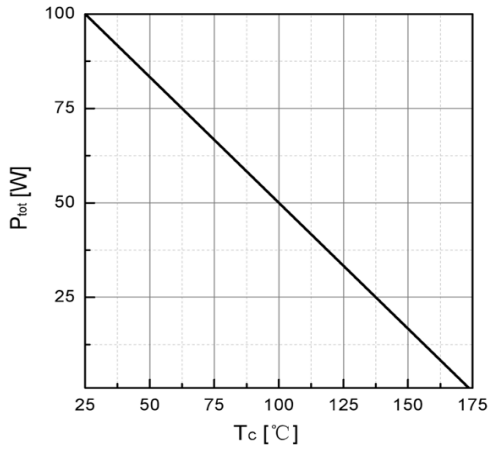


Fig 3. Power dissipation as a function of TC

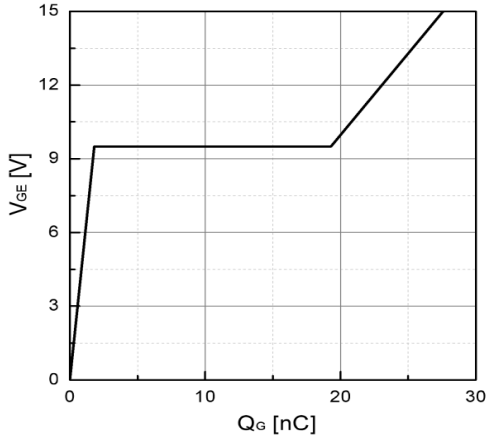


Fig 4. Typical Gate charge

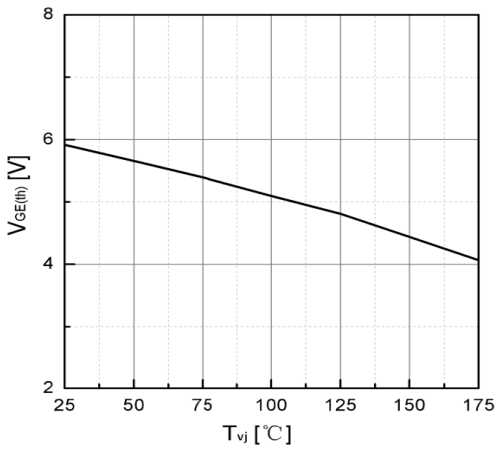


Fig 5. Typical VGE(th) as a function of T_{vj} (IC=1mA)

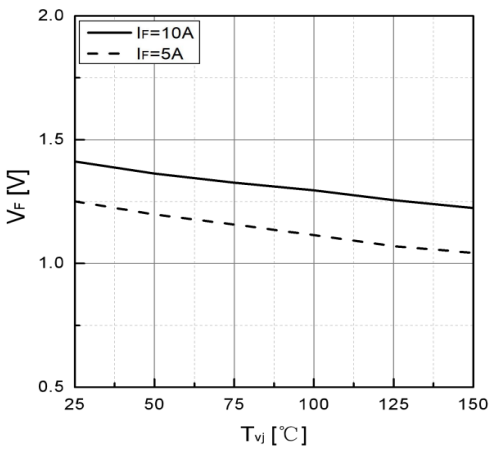


Fig 6. Typical VF as a function of T_{vj}

➢ Typical Performance Characteristics (T_{vj}=25℃ unless otherwise noted)

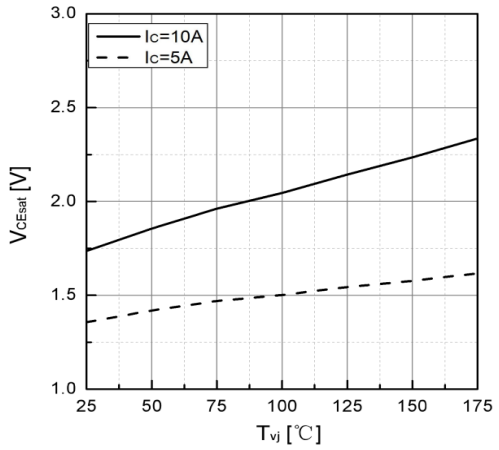


Fig 7. Typical VCEsat as a function of Tvj

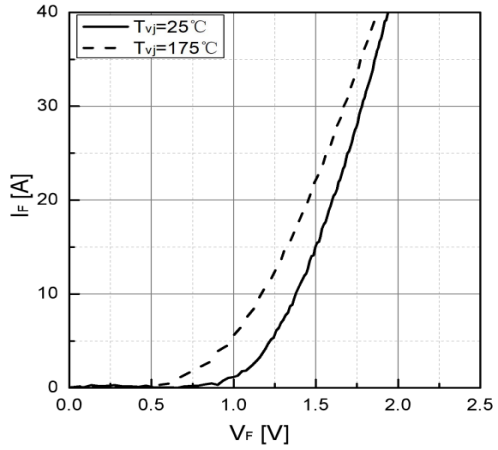


Fig 8. Typical IF as a function of VF

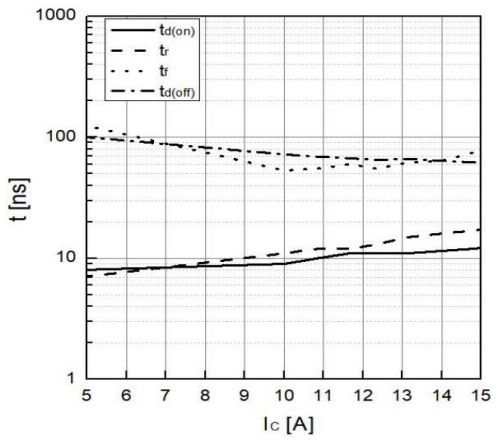


Fig 9. Typical switching time as a function of IC

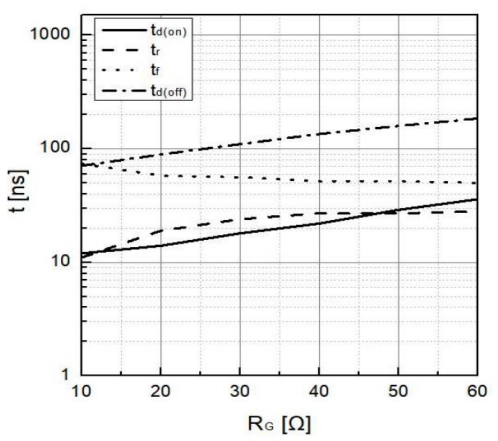


Fig 10. Typical switching times as a function of RG

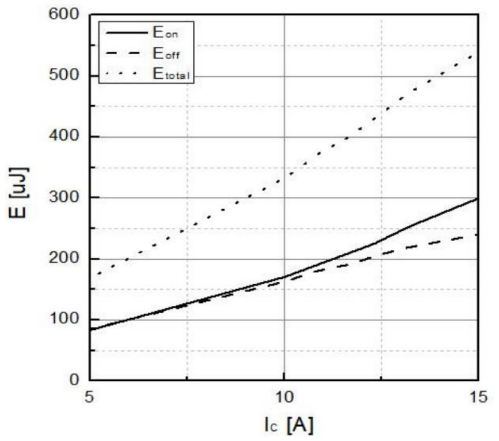


Fig 11. Typical switching energy losses as a function of IC

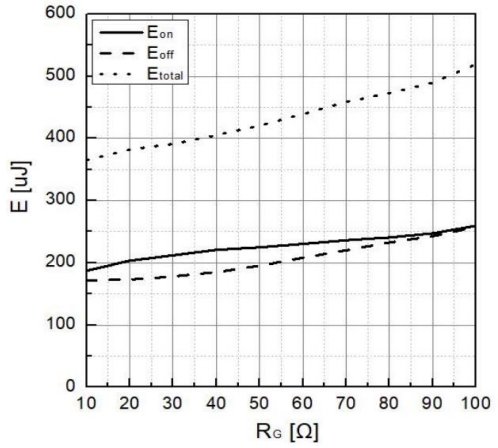


Fig 12. Typical switching times as a function of RG

➢ Typical Performance Characteristics (T_{vj}=25℃ unless otherwise noted)

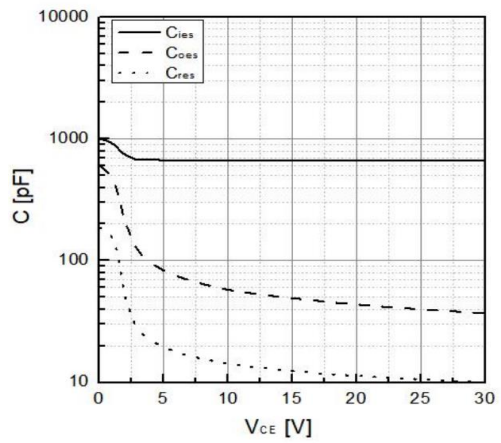
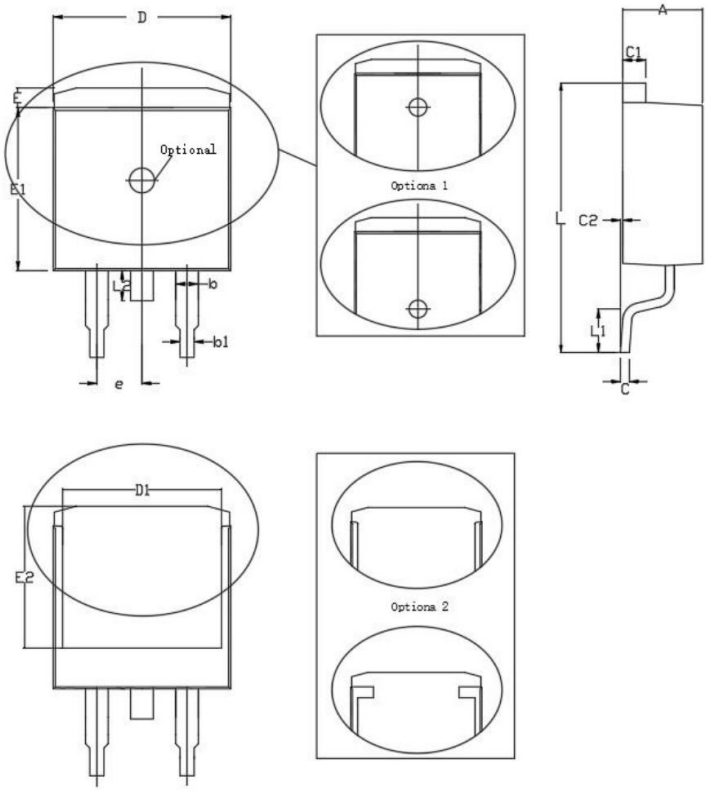


Fig 13. Typical capacitance as a function of VCE (f=1Mhz, VGE=0V)

➢ Package Information

TO263



Symbol	MILL IMETER			Symbol	MILL IMETER		
	Min	Nom	Max		Min	Nom	Max
A	4.40	4.55	4.70	E	1.02	1.27	1.67
b	1.17	1.28	1.37	E1	8.38	9.15	9.65
b1	0.51	0.80	0.91	E2	6.85	8.00	8.40
C	0.38	0.47	0.74	e	2.54BSC		
C1	1.14	1.30	1.65	L	14.61	15.24	15.88
C2	0.02	0.10	0.20	L1	1.50	/	2.60
D	9.65	10.00	10.70	L2	1.30	1.50	1.75
D1	6.25	7.40	8.37				

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