



SSC65TR6GT8

Trench FSII Fast IGBT

➤ Features

V_{CES}	V_{GES}	I_c
650V	$\pm 20V$	12A@25°C
		6A@100°C

➤ Description

- High ruggedness performance.
- Positive VCE (sat) temperature coefficient.
- High efficiency for motor control.
- Excellent current sharing in parallel operation.
- RoHS compliant.

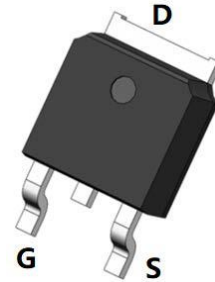
➤ Applications

- Home appliance
- Motor drives
- Fan, Pumps, Vacuum cleaner

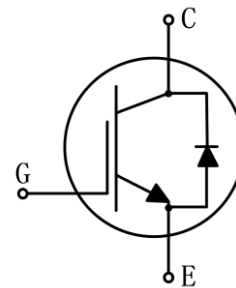
➤ Ordering Information

Device	Package	Shipping
SSC65TR6GT8	TO252	2500/Reel

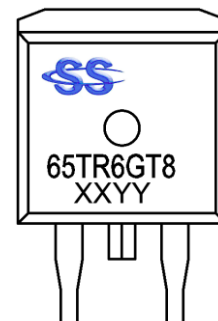
➤ Pin Configuration



TO252 (Top View)



Pin Configuration



Marking

(XXYY: Internal Traceability Code)



➤ **Absolute Maximum Ratings ($T_{vj}=25^{\circ}\text{C}$ 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	$T_C=25^{\circ}\text{C}$	12	A
		$T_C=100^{\circ}\text{C}$	6	
I_{Cpuls}	Pulsed Collector Current, t_p limited by T_{vjmax}		24	A
P_D	Power Dissipation	$T_C=25^{\circ}\text{C}$	136	W
		$T_C=100^{\circ}\text{C}$	68	
T_{VJ}	Operating Junction Temperature Range		-40~175	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range		-55~150	$^{\circ}\text{C}$

➤ **Thermal Resistance Ratings ($T_{vj}=25^{\circ}\text{C}$ unless otherwise noted)**

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance		90	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal resistance, junction to case for IGBT		1.1	
$R_{\theta JC}$	Thermal resistance, junction to case for Diode		3.8	

**➤ Electrical Characteristics of IGBT (T_{vj}=25°C 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 _{vj} =25°C			10	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 =6A, V _{GE} =15V, T _{vj} =25°C		1.7		V
		I _C =6A, V _{GE} =15V, T _{vj} =175°C		2.2		V
V _{GE(th)}	Gate Threshold Voltage	I _C = 1mA, V _{CE} = V _{GE}	5.2	6.2	7.2	V
C _{ies}	Input Capacitance	V _{CE} = 30V, V _{GE} = 0V, f = 1MHz, T _{vj} = 25°C		480		pF
C _{oes}	Output Capacitance			22		
C _{res}	Reverse Transfer Capacitance			8		
T _{D(ON)}	Turn-on delay time	T _{vj} =25°C, V _{CC} =400V, I _C =6A, V _{GE} =0/15V, R _g =10Ω, Inductive Load		10		ns
T _r	Rise time			8		
T _{D(OFF)}	Turn-off delay time			79		
T _f	Fall time			56		
E _{on}	Turn-On Switching Loss			0.11		mJ
E _{off}	Turn-Off Switching Loss			0.10		
E _{ts}	Total Switching Loss			0.21		
T _{D(ON)}	Turn-on delay time	T _{vj} =175°C, V _{CC} =400V, I _C =6A, V _{GE} =0/15V, R _g =10Ω, Inductive Load		11		ns
T _r	Rise time			10		
T _{D(OFF)}	Turn-off delay time			108		
T _f	Fall time			89		
E _{on}	Turn-On Switching Loss			0.16		mJ
E _{off}	Turn-Off Switching Loss			0.16		
E _{ts}	Total Switching Loss			0.32		
Q _G	Total Gate Charge	V _{CC} = 520V, I _C = 6A, V _{GE} = 0/15V		19		nC
Q _{ge}	Gate to emitter charge			1.8		
Q _{gc}	Gate to collector charge			12		



➤ **Electrical characteristics of Diode ($T_{vj}=25^{\circ}\text{C}$ unless otherwise noted)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VF	Diode forward voltage	IF=6A, $T_{vj}=25^{\circ}\text{C}$		1.6		V
		IF=6A, $T_{vj}=175^{\circ}\text{C}$		1.4		V
Trr	Diode reverse recovery time	VR=400V IF=6A diF/dt=500A/ μs , $T_{vj}=25^{\circ}\text{C}$		55		ns
Irm	Diode peak reverse recovery current			10		A
Qrr	Diode reverse recovery charge			306		nC
Trr	Diode reverse recovery time	VR=400V IF=6A diF/dt=500A/ μs , $T_{vj}=175^{\circ}\text{C}$		98		ns
Irm	Diode peak reverse recovery current			12		A
Qrr	Diode reverse recovery charge			529		nC

➤ Typical Performance Characteristics ($T_{vj}=25^{\circ}\text{C}$ unless otherwise noted)

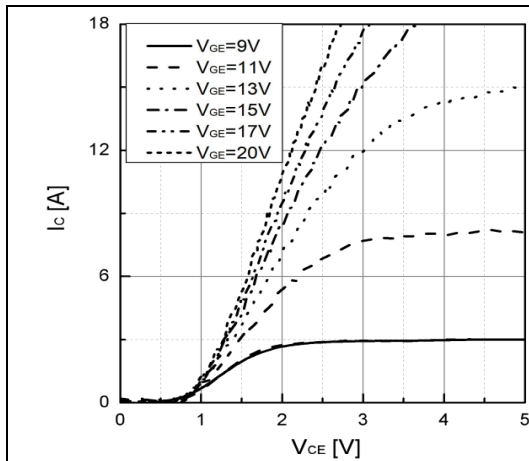


Fig 1. Typical output characteristic ($T_{vj}=25^{\circ}\text{C}$)

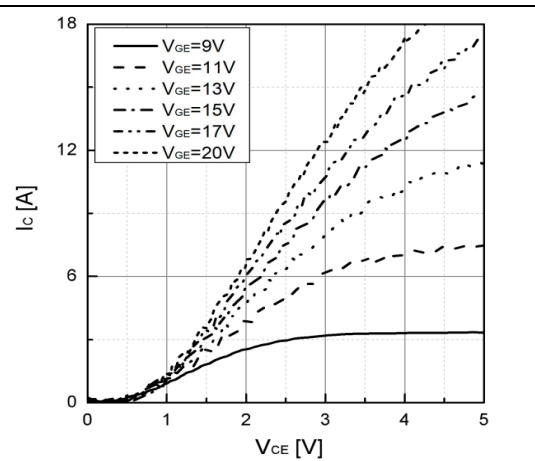


Fig 2. Typical output characteristic ($T_{vj}=175^{\circ}\text{C}$)

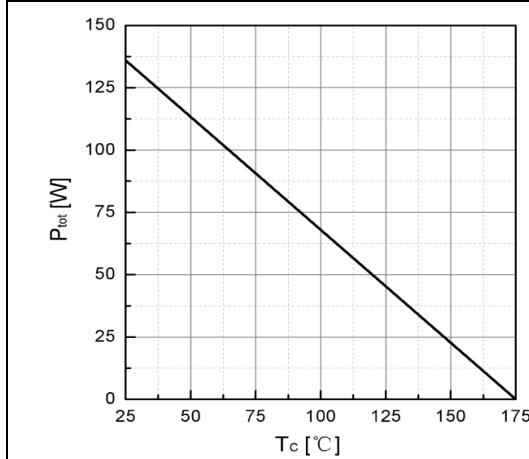


Fig 3. Power dissipation as a function of T_c

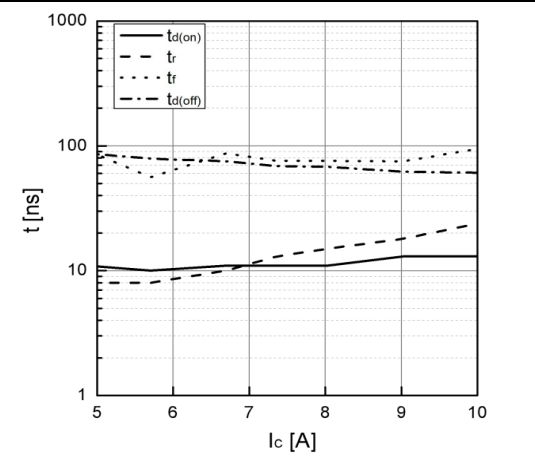


Fig 4. Typical switching time as a function of I_c

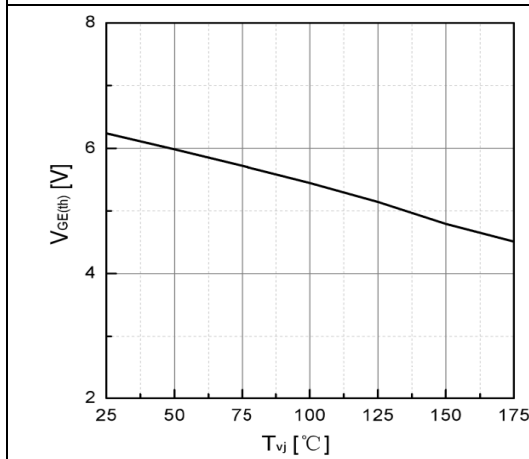


Fig 5. Typical $V_{GE(th)}$ as a function of T_{vj}
($I_c=1\text{mA}$)

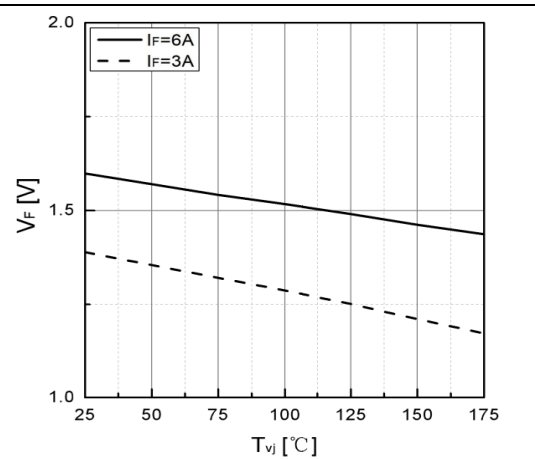


Fig 6. Typical V_F as a function of T_{vj}

➤ **Typical Performance Characteristics ($T_{vj}=25^{\circ}\text{C}$ unless otherwise noted)**

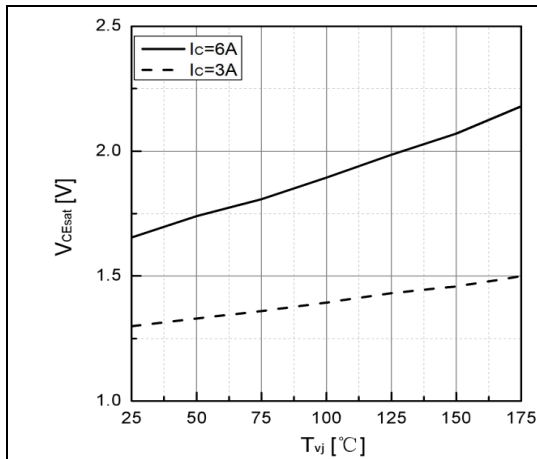


Fig 7. Typical VCEsat as a function of T_{vj}

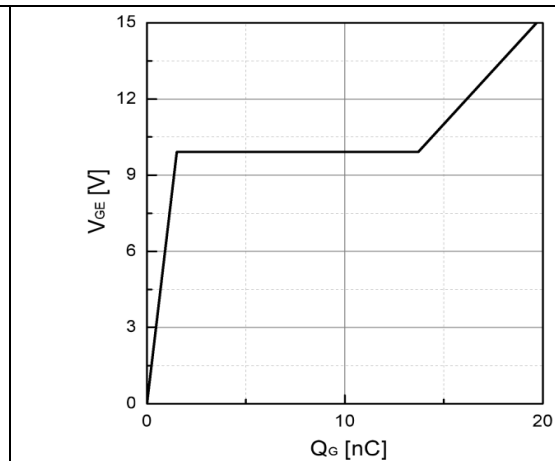


Fig 8. Typical Gate charge

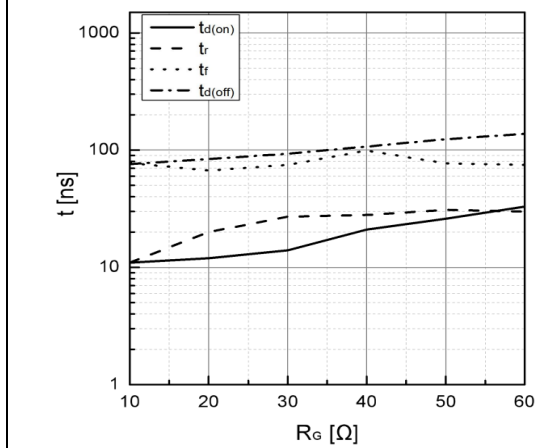


Fig 9. Typical switching times as a function of R_G

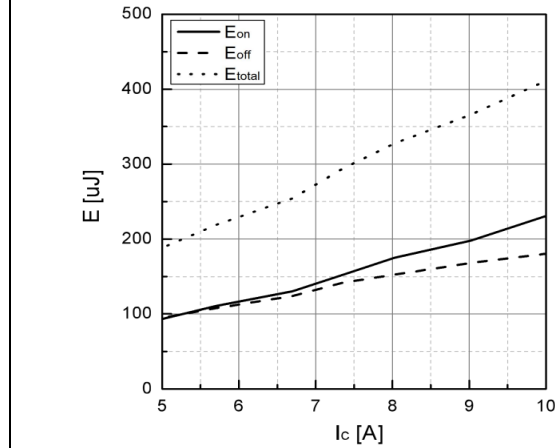


Fig 10. Typical switching energy losses as a function of I_C

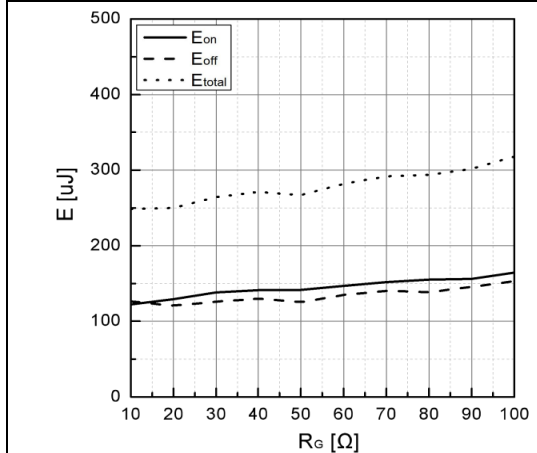


Fig 11. Typical switching energy losses as a function of R_G

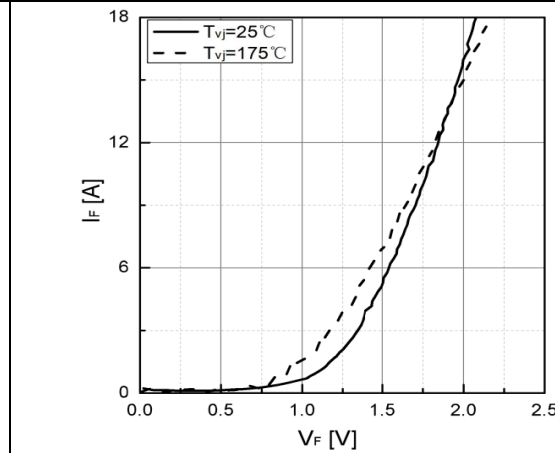
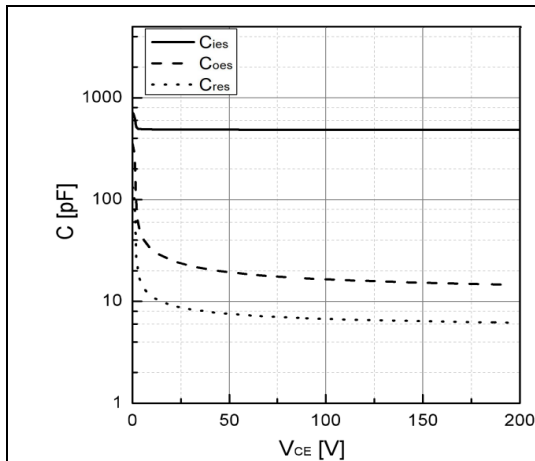


Fig 12. Typical I_F as a function of V_F

➤ **Typical Performance Characteristics ($T_{vj}=25^{\circ}\text{C}$ unless otherwise noted)**



**Fig 13. Typical capacitance as a function of VCE
($f=1\text{MHz}$, $V_{GE}=0\text{V}$)**

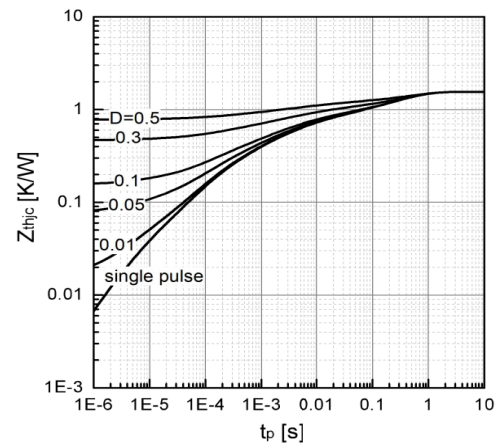
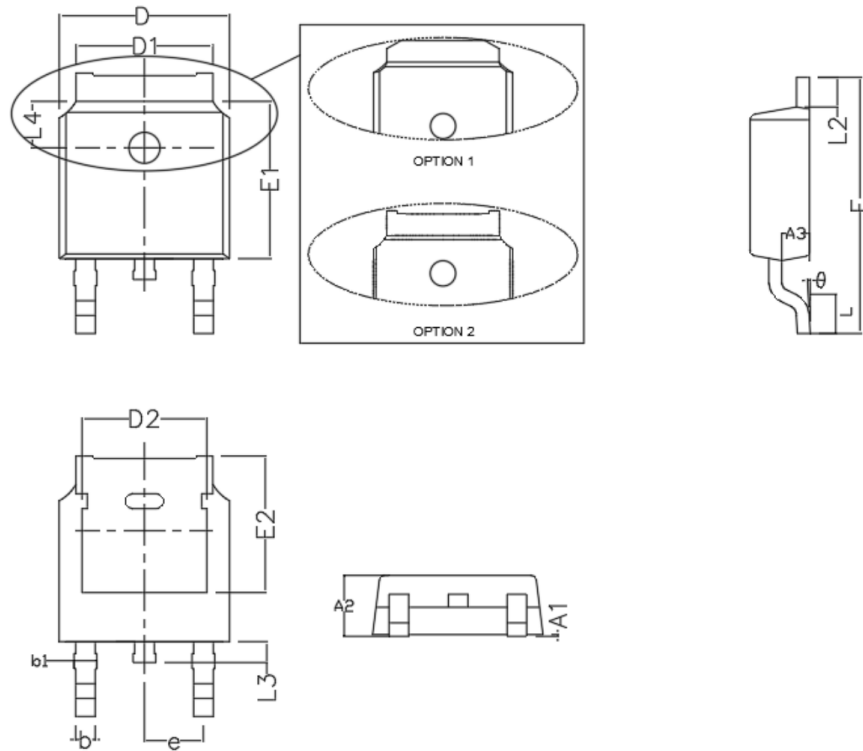


Fig 14. Transient thermal impedance of IGBT

➤ Package Information

TO252



Symbol	MILL IMETER			Symbol	MILL IMETER		
	Min	Nom	Max		Min	Nom	Max
A1	0.000	/	0.200	E1	5.800	6.100	6.400
A2	2.100	2.300	2.500	E2	5.100	5.450	5.600
A3	0.900	1.040	1.170	e	2.286TYP		
b	0.600	0.762	0.910	L	1.270	1.500	2.032
b1	0.680	0.840	1.145	L2	0.900	1.100	1.270
D	6.300	6.600	6.900	L3	0.600	0.800	1.000
D1	4.950	5.330	5.700	L4	1.600	1.800	2.000
D2	4.315	4.830	5.230	θ	0°	/	10°
E	9.395	10.100	10.700				



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