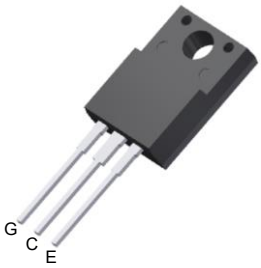
SSC65TR6GTF

Trench FSII Fast IGBT

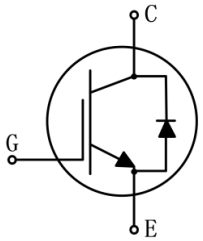
➢ Features

V_{CES}	V_{GES}	I_C
650V	±20V	12A@25℃
		6A@100℃

➢ Pin Configuration



TO-220F-3L (Top View)



Pin Configuration

➢ Description

- High ruggedness performance.
- 10μs short circuit capability.
- Positive VCE (sat) temperature coefficient.
- High efficiency for motor control.
- Excellent current sharing in parallel operation.
- RoHS compliant.

➢ Applications

- Home appliance
- Motor drives
- General inverter

➢ Ordering Information

Device	Package	Shipping
SSC65TR6GTF	TO-220F-3L	50/Tube

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℃	12	A
		T_C=100℃	6	
I_{Cpuls}	Pulsed Collector Current, t_p limited by T_{vjmax}		24	A
P_D	Power Dissipation	T_A=25℃	30	W
		T_A=100℃	15	
T_{VJ}	Operating Junctio Temperature Range		-40~175	℃
T_{STG}	Storage Temperature Range		-55~150	℃
Tsc	Short circuit withstand time		10	μs

➢ Thermal Resistance Ratings (T_{vj}=25℃ unless otherwise noted)

Symbol	Parameter	Ratings(MAX)	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance	90	℃/W
$R_{\theta JC}$	Junction-to-Case for IGBT, Thermal Resistance	5.0	
$R_{\theta JC}$	Junction-to-Case for Diode, Thermal Resistance	5.8	

➢ 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, T_{vj}=25℃			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℃		1.7		V
		I_C=6A, V_{GE}=15V, T_{vj}=175℃		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℃		480		pF
C_{oes}	Output Capacitance			22		
C_{res}	Reverse Transfer Capacitance			8		
$T_{D(ON)}$	Turn-on delay time	T_{vj}=25℃, 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℃, 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

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

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

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

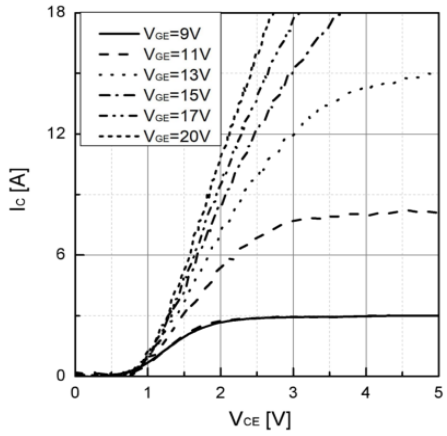


Figure 1. Output Characteristics(T_{vj}=25℃)

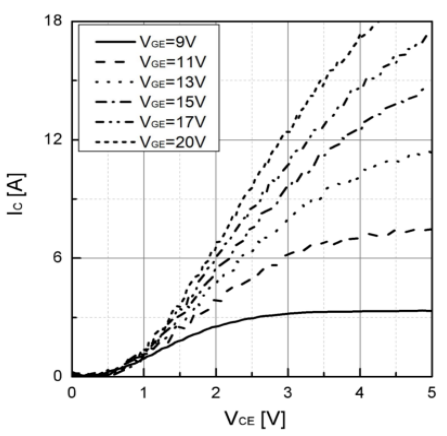


Figure 2. Output Characteristics(T_{vj}=175℃)

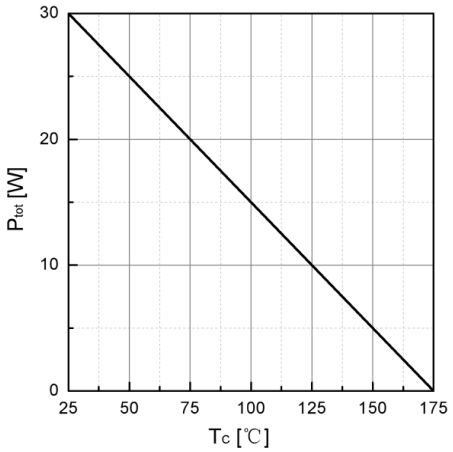


Figure 3. Power dissipation as a function of T_C

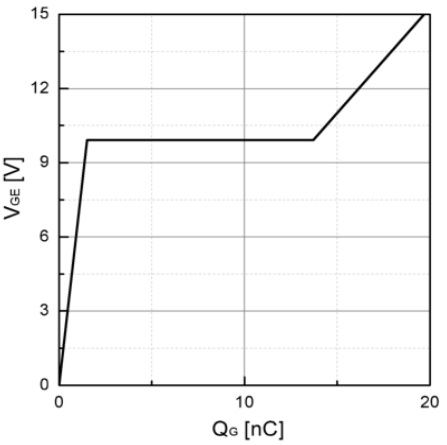


Figure 4. Typical Gate charge

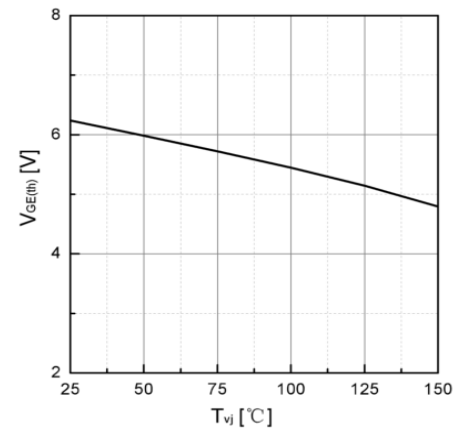


Figure 5. Typical $V_{GE(th)}$ as a function of Tvj (IC=1mA)

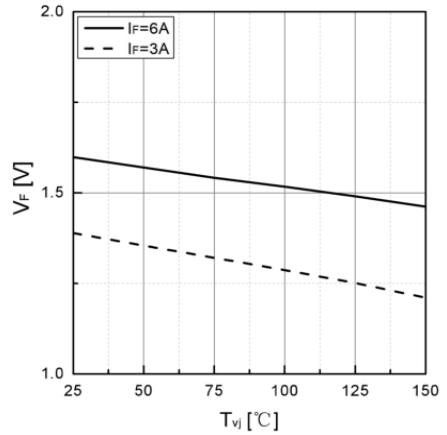


Figure 6. Typical V_F as a function of T_{vj}

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

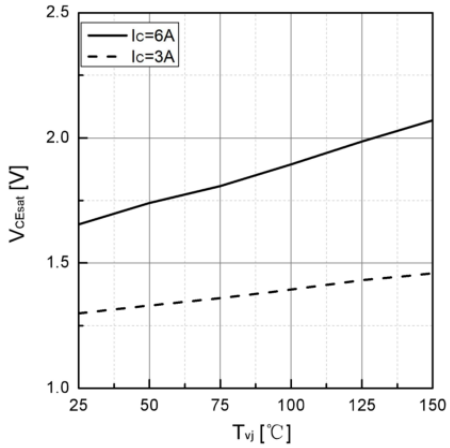


Figure 7. Typical V_{CEsat} as a function of T_{vj}

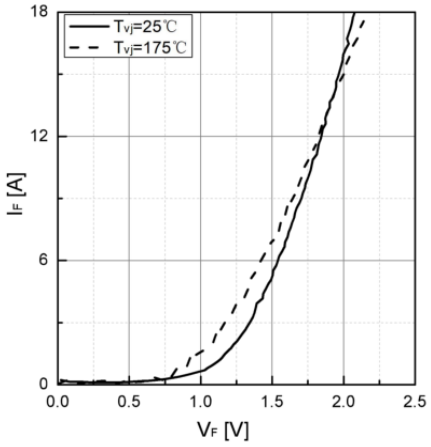


Figure 8. Typical I_F as a function of V_F

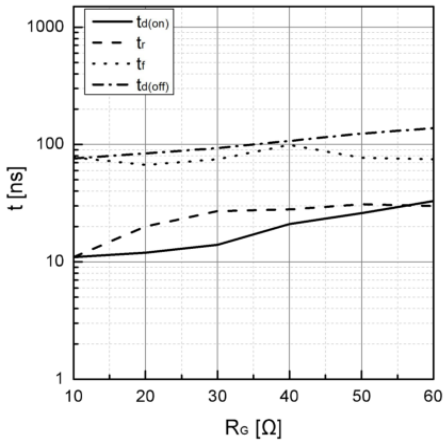


Figure 9. Typical switching times as a function of R_G

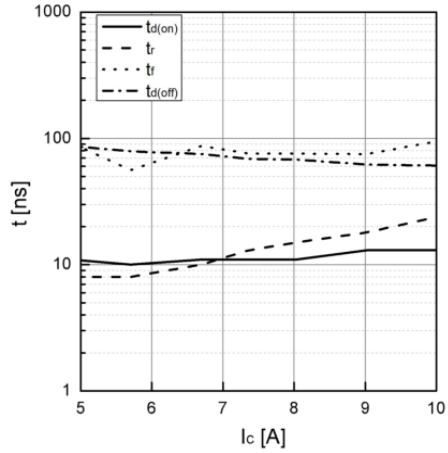


Figure 10. Typical switching times as a function of Ic

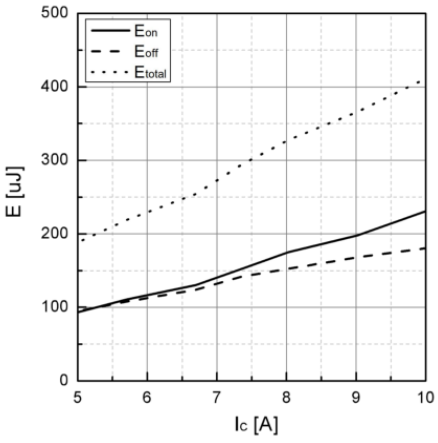


Figure 11. Typical switching energy losses as a function of I_C

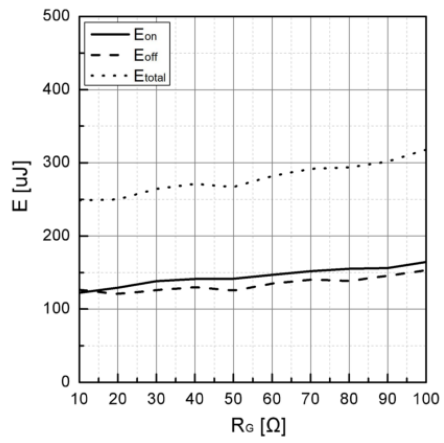


Figure 12. Typical switching energy losses as a function of R_G

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

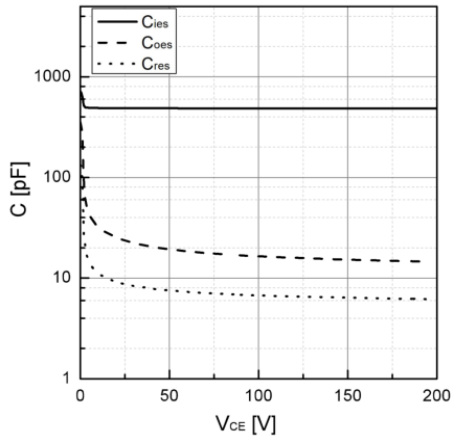
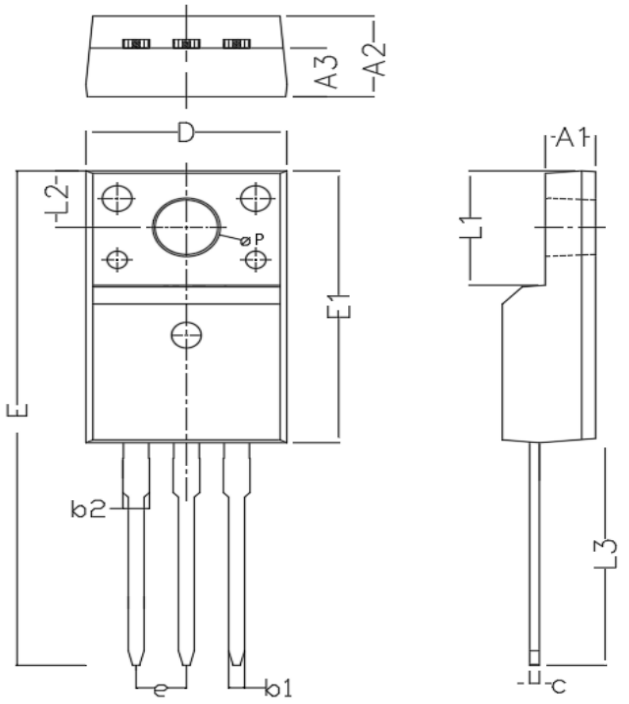


Figure 13. Typical capacitance as a function of V_{CE}(f=1Mhz, V_{GE}=0V)

➢ Package Information

TO220F



Symbol	MILL IMETER		
	Min	Nom	Max
A1	2.34	2.54	2.74
A2	4.5	4.7	4.9
A3	2.56	2.76	2.96
b1	0.7	0.8	0.9
b2	1.23	1.3	1.47
c	0.45	0.5	0.6
D	9.96	10.16	10.36
E	28.35	28.85	29.35
E1	15.67	15.87	16.07
e	2.54REF		
L1	6.48	6.68	6.88
L2	3.2	3.3	3.4
L3	12.68	12.98	13.28
øP	3.03	3.4	3.5

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