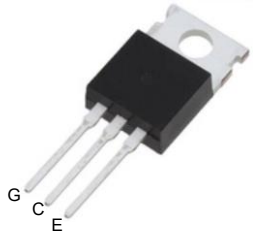
SSC65T15GT4

Trench FSII Fast IGBT

➢ Features

V_{CES}	V_{GES}	I_C
650V	±20V	30A@25℃
		15A@100℃

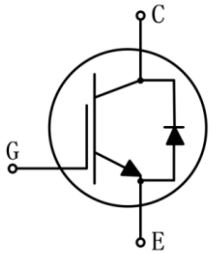
➢ Pin Configuration



TO-220 (Top View)

➢ 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.



Pin Configuration

➢ Applications

- Home appliances
- Motor drives
- General inverter

➢ Ordering Information

Device	Package	Shipping
SSC65T15GT4	TO-220-3L	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℃	30	A
		T_C=100℃	15	
I_{Cpuls}	Pulsed Collector Current, t_p limited by T_{vJmax}		60	A
P_D	Power Dissipation [a]	T_C=25℃	150	W
		T_C=100℃	75	
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		40	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case for IGBT		1.0	
$R_{\theta JC}$	Thermal Resistance, Junction to Case for Diode		2.1	

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=15A, V_{GE}=15V, T_{vj}=25℃		1.6		V
		I_C=15A, V_{GE}=15V, T_{vj}=175℃		1.9		V
$V_{GE(th)}$	Gate Threshold Voltage	I_C = 1mA, V_{CE} = V_{GE}	5.4	5.6	5.9	V
C_{ies}	Input Capacitance	V_{CE} = 30V, V_{GE} = 0V, f = 1MHz		1055		pF
C_{oes}	Output Capacitance			57		
C_{res}	Reverse Transfer Capacitance			15		
$T_{D(ON)}$	Turn-on delay time	T_{vj}=25℃, V_{CC}=400V, I_C=15A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		17		ns
T_r	Rise time			14		
$T_{D(OFF)}$	Turn-off delay time			104		
T_f	Fall time			46		
E_{on}	Turn-On Switching Loss			0.30		mJ
E_{off}	Turn-Off Switching Loss			0.27		
E_{ts}	Total Switching Loss			0.57		
$T_{D(ON)}$	Turn-on delay time	T_{vj}=175℃, V_{CC}=400V, I_C=15A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		16		ns
T_r	Rise time			15		
$T_{D(OFF)}$	Turn-off delay time			122		
T_f	Fall time			93		
E_{on}	Turn-On Switching Loss			0.41		mJ
E_{off}	Turn-Off Switching Loss			0.42		
E_{ts}	Total Switching Loss			0.83		
Q_G	Total Gate Charge	V_{CC} = 520V, I_C = 15A, V_{GE} = 0/15V		55		nC
Q_{GE}	Gate to emitter charge			3.8		
Q_{GC}	Gate to collector charge			33		

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VF	Diode forward voltage	IF=15A, T_{vj}=25℃		1.4		V
		IF=15A, T_{vj}=175℃		1.1		V
Trr	Diode reverse recovery time	VR=400V IF=15A diF/dt=600A/μs T_{vj}=25℃		55		ns
Irrm	Diode peak reverse recovery current			9.5		A
Qrr	Diode reverse recovery charge			220		nC
Trr	Diode reverse recovery time	VR=400V IF=15A diF/dt=600A/μs T_{vj}=175℃		78		ns
Irrm	Diode peak reverse recovery current			16		A
Qrr	Diode reverse recovery charge			470		nC

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

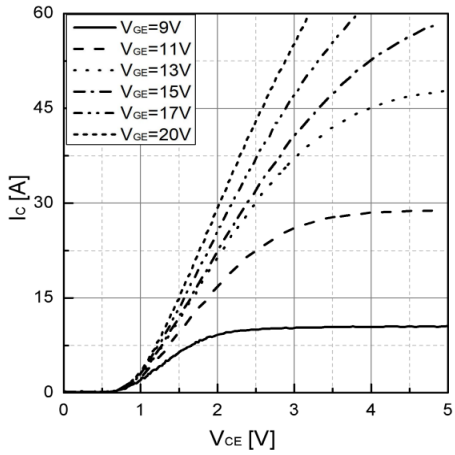


Fig 1. Typical output characteristic (Tvj=25℃)

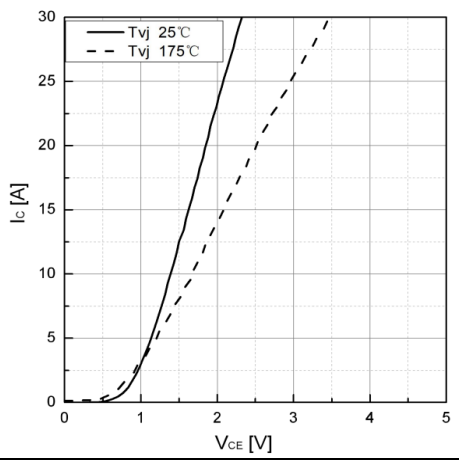


Fig 2. Saturation pressure drop characteristic

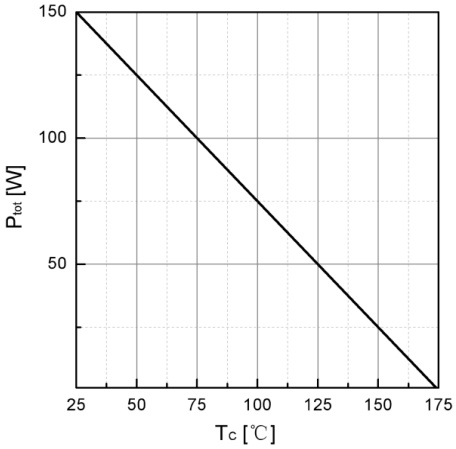


Fig 3. Power dissipation as a function of TC

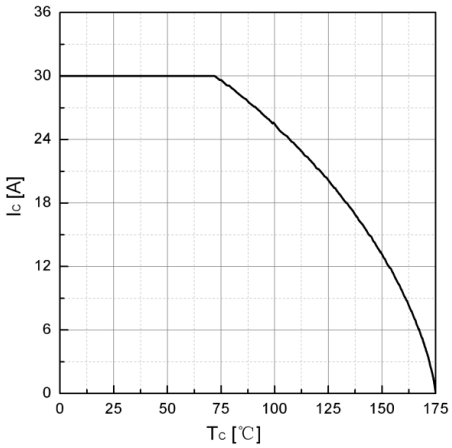


Fig 4.Collector current as a function of case temperature(VGE≥15V,Tvj≤175℃)

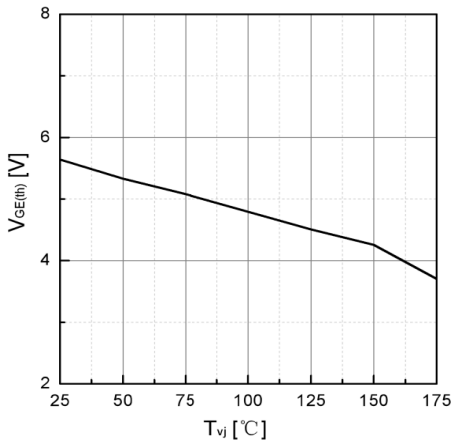


Fig 5. Typical VGE(th) as a function of Tvj (IC=1mA)

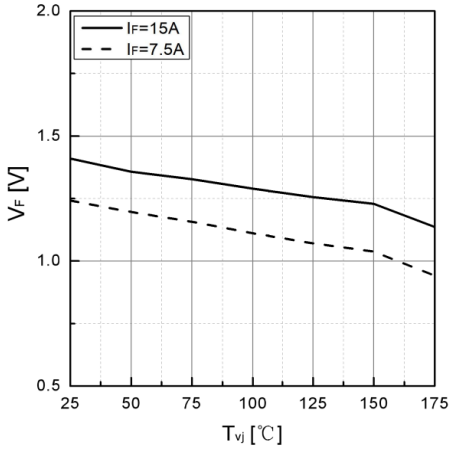


Fig 6. Typical VF as a function of Tvj

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

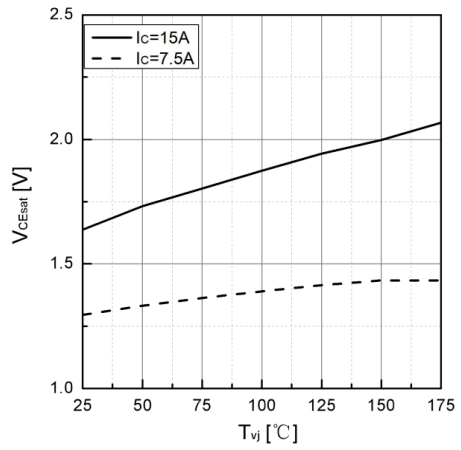


Fig 7. Typical VCEsat as a function of Tvj

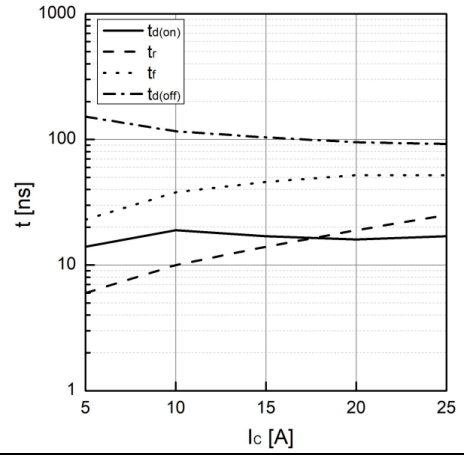


Fig 8. Typical switching times as a function of IC

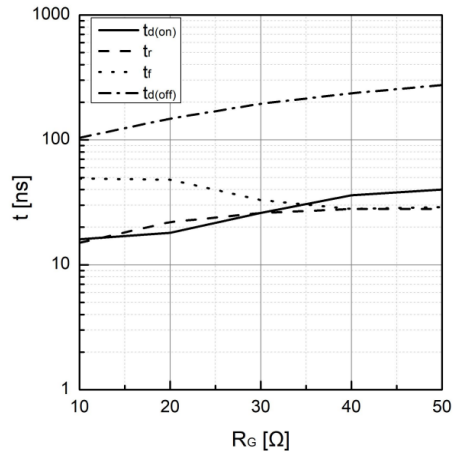


Fig 9. Typical switching times as a function of RG

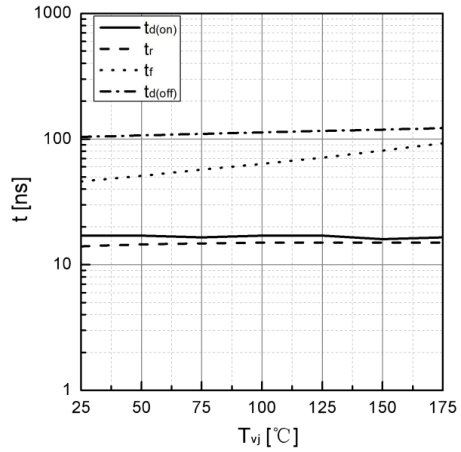


Fig 10. Typical switching times as a function of Tvj

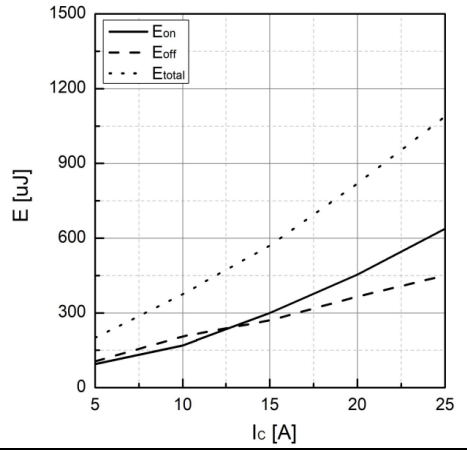


Fig 11. Typical switching energy losses as a function of IC

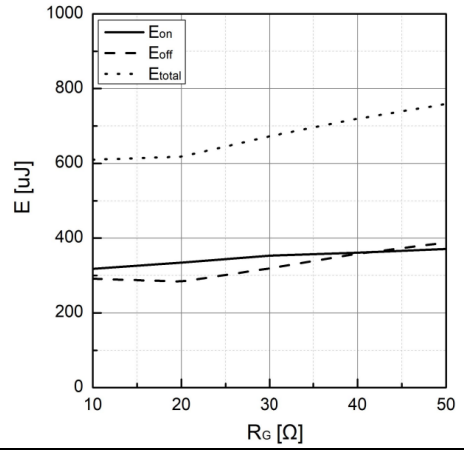


Fig 12. Typical switching energy losses as a function of RG

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

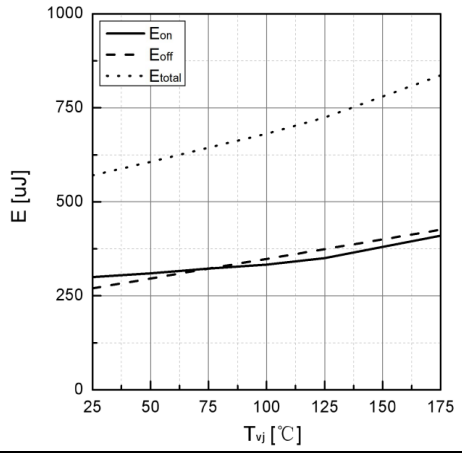


Fig 13. Typical switching energy losses as a function of Tvj

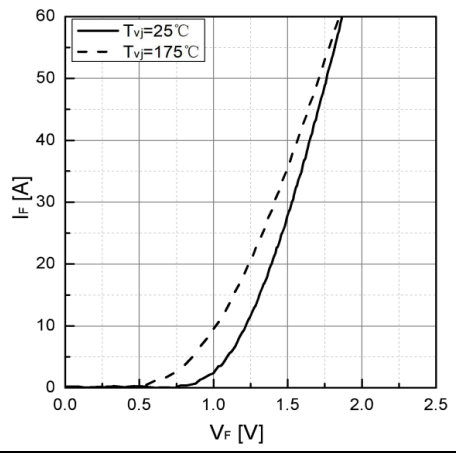


Fig 14. Typical IF as a function of VF

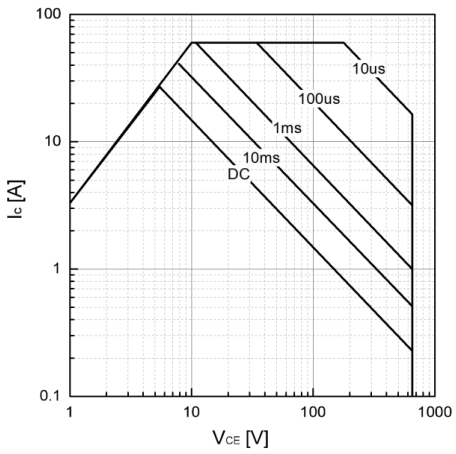


Fig 15. Safe operating area

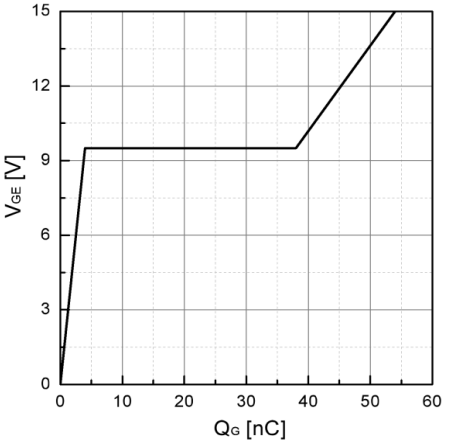


Fig 16. Typical Gate charge

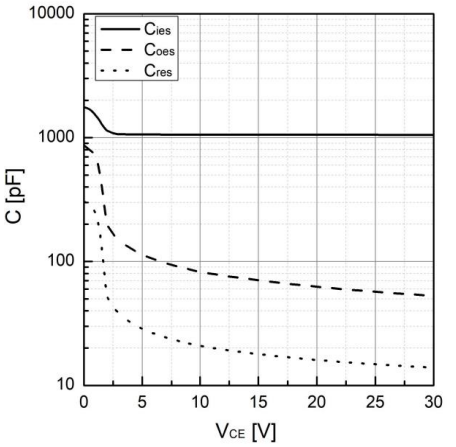


Fig 17. Typical capacitance as a function of VCE(f=1Mhz, VGE=0V)

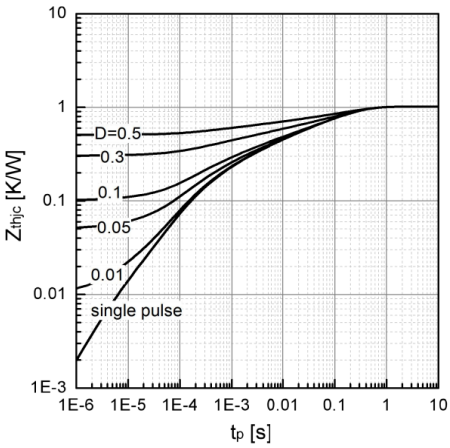
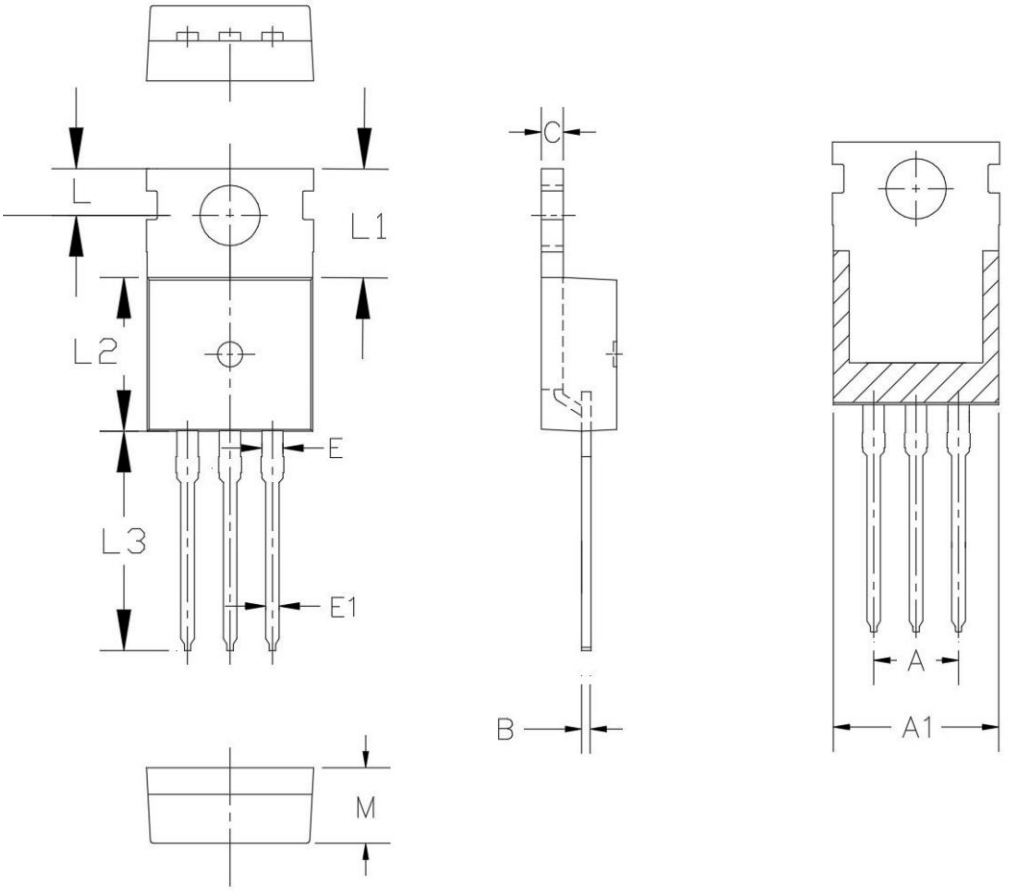


Fig 18. Transient thermal impedance, IGBT

➢ Package Information

TO220



Symbol	MILL IMETER		
	Min	Nom	Max
A		5.08 BSC	
A1	9.00	10.00	11.00
B	0.33	--	0.65
C	1.20	--	1.40
E	1.17	--	1.37
E1	0.60	--	1.10
L	2.50	--	3.00
L1	6.3	6.5	6.7
L2	8.95	--	9.75
L3	12.88	--	13.40
M	4.30	--	4.70

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