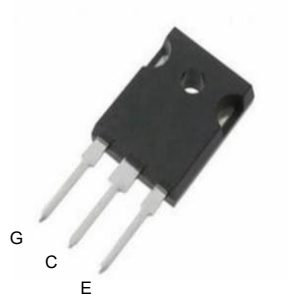
SSC65TR30GT2

Trench FSII Fast IGBT

➢ Features

V_{CES}	V_{GES}	I_C
650V	±20V	60A@25℃
		30A@100℃

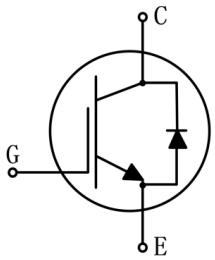
➢ Pin Configuration



TO-247-3L (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 complian



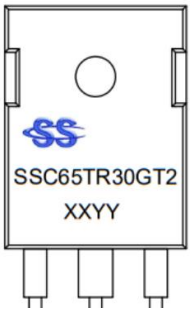
Pin Configuration

➢ Applications

- Welding Machines
- PFC Circuits
- UPS
- Power Inverters

➢ Ordering Information

Device	Package	Shipping
SSC65TR30GT2	TO-247-3L	30/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℃	60	A
		T_C=100℃	30	
I_{Cpuls}	Pulsed Collector Current, t_p limited by T_{vJmax}		120	A
P_D	Power Dissipation [a]	T_C=25℃	300	W
		T_C=100℃	150	
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		0.5	
$R_{\theta JC}$	Thermal Resistance, Junction to Case for Diode		0.9	

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=30A, V_{GE}=15V, T_{vj}=25℃		1.7		V
		I_C=30A, V_{GE}=15V, T_{vj}=175℃		2.2		V
$V_{GE(th)}$	Gate Threshold Voltage	I_C = 1mA, V_{CE} = V_{GE}	5.3	5.7	5.9	V
C_{ies}	Input Capacitance	V_{CE} = 30V, V_{GE} = 0V, f = 1MHz		1978		pF
C_{oes}	Output Capacitance			100		
C_{res}	Reverse Transfer Capacitance			23		
$T_{D(ON)}$	Turn-on delay time	T_{vj}=25℃, V_{CC}=400V, I_C=30A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		30		ns
T_r	Rise time			39		
$T_{D(OFF)}$	Turn-off delay time			151		
T_f	Fall time			29		
E_{on}	Turn-On Switching Loss			0.95		mJ
E_{off}	Turn-Off Switching Loss			0.6		
E_{ts}	Total Switching Loss			1.55		
$T_{D(ON)}$	Turn-on delay time	T_{vj}=175℃, V_{CC}=400V, I_C=30A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		28		ns
T_r	Rise time			40		
$T_{D(OFF)}$	Turn-off delay time			169		
T_f	Fall time			71		
E_{on}	Turn-On Switching Loss			1.5		mJ
E_{off}	Turn-Off Switching Loss			0.8		
E_{ts}	Total Switching Loss			2.3		
Q_G	Total Gate Charge	V_{CC} = 520V, I_C = 30A, V_{GE} = 0/15V		103		nC

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VF	Diode forward voltage	IF=30A, T_{vj}=25℃		1.4		V
		IF=30A, T_{vj}=175℃		1.2		V
Trr	Diode reverse recovery time	VR=400V IF=30A diF/dt=550A/μs T_{vj}=25℃		105		ns
Irrm	Diode peak reverse recovery current			16		A
Qrr	Diode reverse recovery charge			876		nC
Trr	Diode reverse recovery time	VR=400V IF=30A diF/dt=550A/μs T_{vj}=175℃		171		ns
Irrm	Diode peak reverse recovery current			26		A
Qrr	Diode reverse recovery charge			2650		nC

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

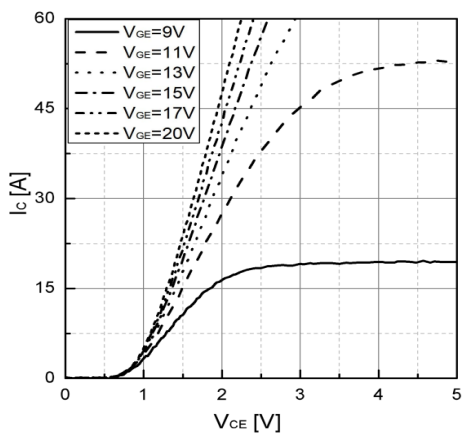


Fig 1. Typical output characteristic (T_{vj}=25℃)

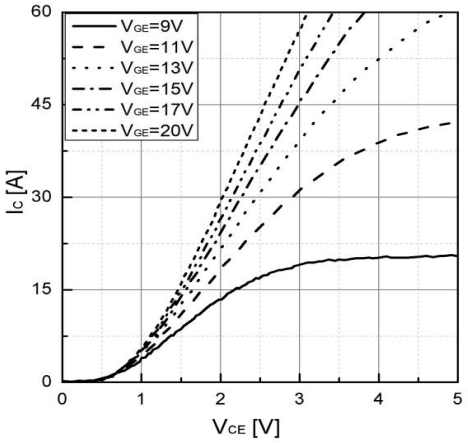


Fig 2. Typical output characteristic(T_{vj}=175℃)

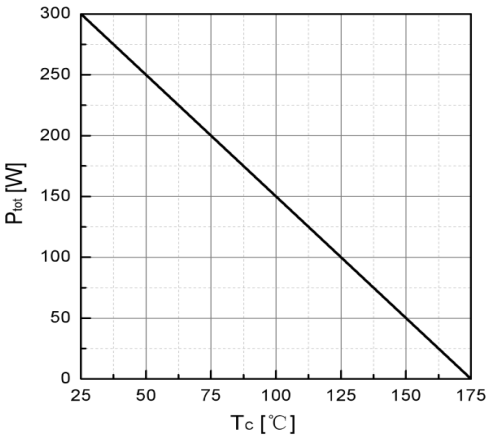


Fig 3. Power dissipation as a function of TC

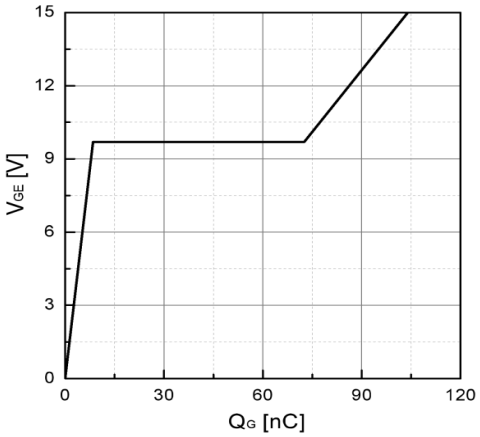


Fig 4. Typical Gate charge

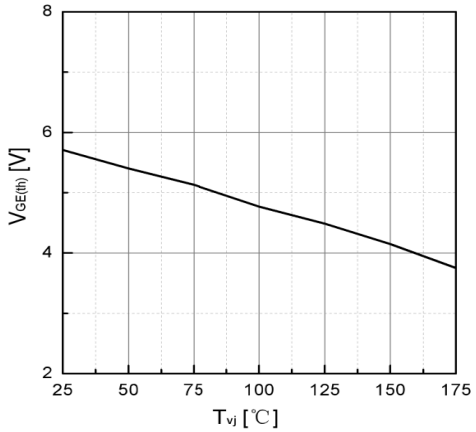


Fig 5. Typical VGE(th) as a function of T_{vj} (IC=1mA)

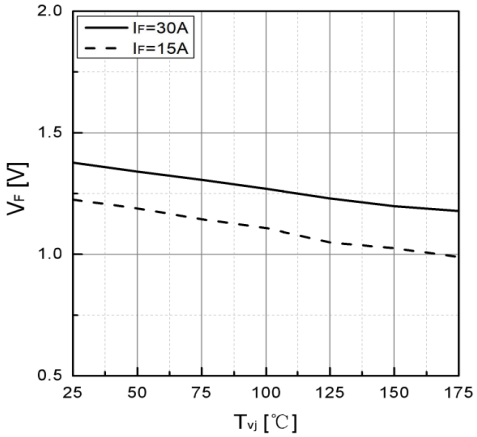


Fig 6. Typical VF as a function of T_{vj}

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

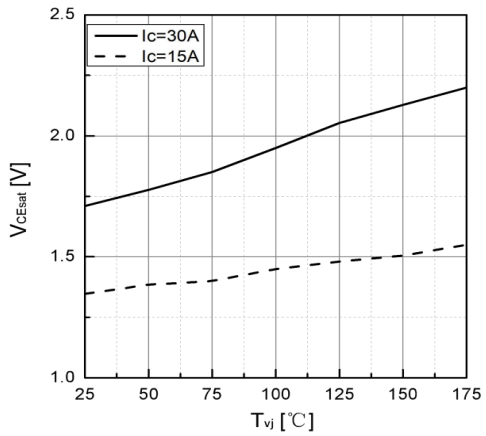


Fig 7. Typical VCEsat as a function of Tvj

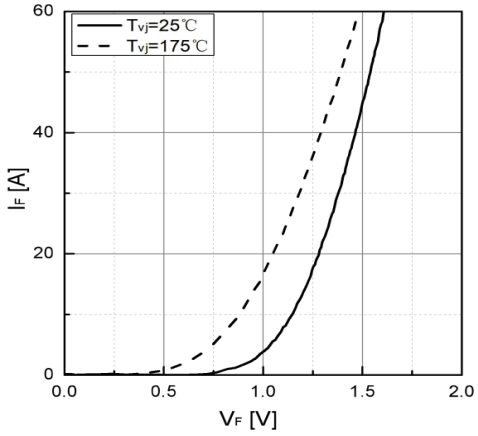


Fig 8. Typical IF as a function of VF

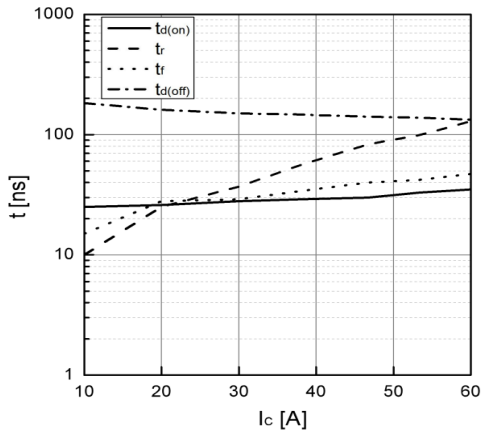


Fig 9. Typical switching time as a function of IC

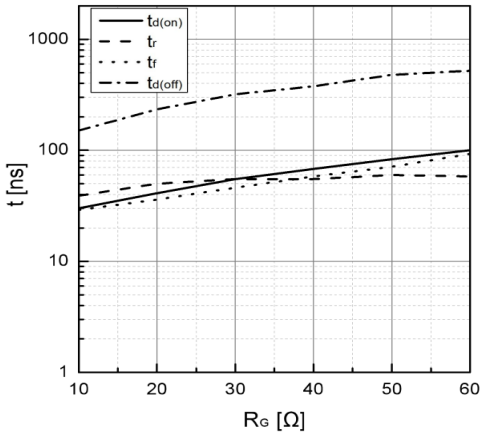


Fig 10. Typical switching times as a function of RG

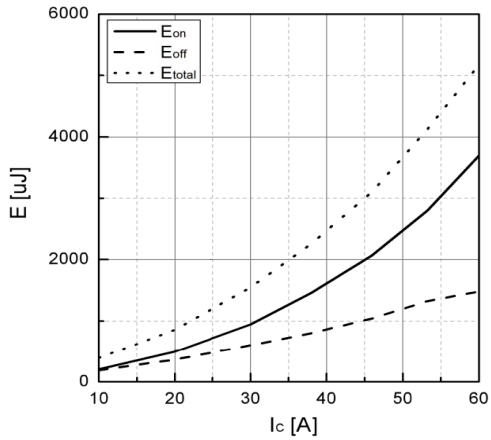


Fig 11. Typical switching energy losses as a function of IC

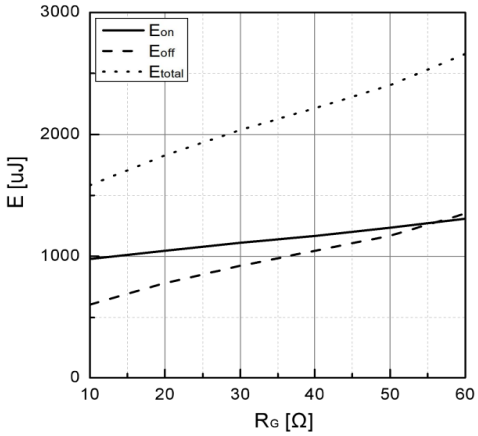


Fig 12. Typical switching times as a function of RG

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

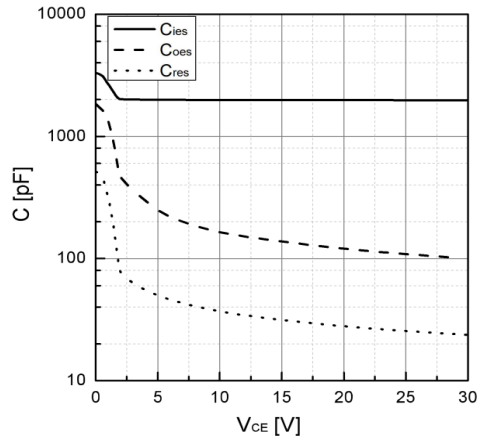


Fig 13. Typical capacitance as a function of VCE (f=1Mhz, VGE=0V)

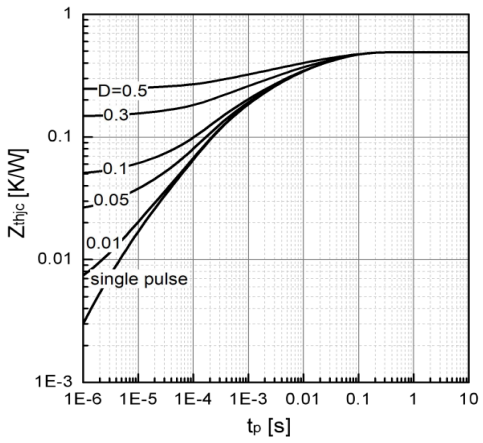
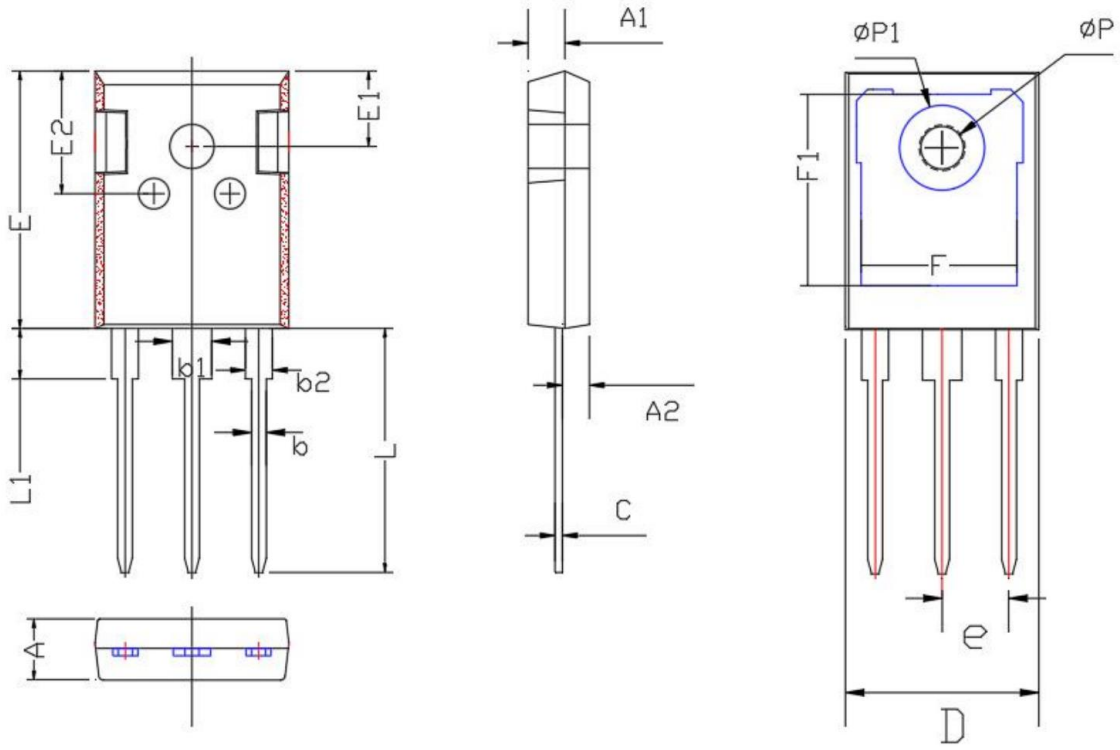


Fig 14. Transient thermal impedance of IGBT

➢ Package Information

TO247



Symbol	MILL IMETER			Symbol	MILL IMETER		
	Min	Nom	Max		Min	Nom	Max
A	4.80	5.00	5.20	E1	5.60	5.80	6.20
A1	3.30	3.50	3.70	E2	9.8	10.0	10.2
A2	2.20	2.40	2.60	e	5.25	5.45	5.65
b	1.00	1.20	1.40	F	13.1	13.4	13.7
b1	2.90	3.10	3.30	F1	16.25	16.55	16.85
b2	1.90	2.10	2.30	L	19.5	20.0	20.5
c	0.50	0.60	0.71	L1	4.00	4.20	4.40
D	15.2	15.7	16.2	P	3.30	3.50	3.80
E	20.8	21	21.2	P1	6.80	7.10	7.40

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