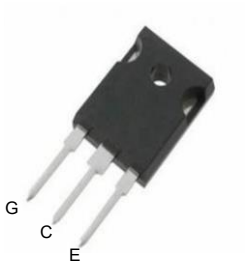
SSC65TR40NGT2

Trench FSII Fast IGBT

➢ Features

V_{CES}	V_{GES}	I_C
650V	±20V	80A@25℃
		40A@100℃

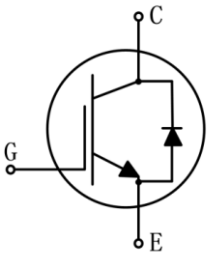
➢ Pin Configuration



TO247-3L (Top View)

➢ Description

- High efficiency for inverters.
- High ruggedness performance.
- RoHS compliant.



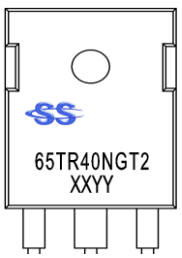
Pin Configuration

➢ Applications

- PFC applications.
- Uninterruptible power supplies.
- Solar inverters.

➢ Ordering Information

Device	Package	Shipping
SSC65TR40NGT2	TO247-3L	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℃	80	A
		T_C=100℃	40	
I_{Cpuls}	Pulsed Collector Current, t_p limited by T_{vJmax}		160	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	℃

➢ 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=40A, V_{GE}=15V, T_{vj}=25℃		1.7		V
		I_C=40A, V_{GE}=15V, T_{vj}=150℃		2.2		V
$V_{GE(th)}$	Gate Threshold Voltage	I_C = 1mA, V_{CE} = V_{GE}	4.0	5.0	6.0	V
C_{ies}	Input Capacitance	V_{CE} = 30V, V_{GE} = 0V, f = 1MHz		2480		pF
C_{oes}	Output Capacitance			95		
C_{res}	Reverse Transfer Capacitance			21		
$T_{D(ON)}$	Turn-on delay time	T_{vj}=25℃, V_{CC}=400V, I_C=40A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		32		ns
T_r	Rise time			59		
$T_{D(OFF)}$	Turn-off delay time			110		
T_f	Fall time			52		
E_{on}	Turn-On Switching Loss			1.2		mJ
E_{off}	Turn-Off Switching Loss			0.6		
E_{ts}	Total Switching Loss			1.8		
$T_{D(ON)}$	Turn-on delay time	T_{vj}=150℃, V_{CC}=400V, I_C=40A, V_{GE}=0/15V, R_g=10Ω, Inductive Load		28		ns
T_r	Rise time			52		
$T_{D(OFF)}$	Turn-off delay time			128		
T_f	Fall time			75		
E_{on}	Turn-On Switching Loss			1.6		mJ
E_{off}	Turn-Off Switching Loss			0.9		
E_{ts}	Total Switching Loss			2.5		
Q_G	Total Gate Charge	V_{CC} = 520V, I_C = 40A, V_{GE} = 0/15V		78		nC

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VF	Diode forward voltage	IF=40A, T_{vj}=25℃		1.5		V
		IF=40A, T_{vj}=150℃		1.3		V
Trr	Diode reverse recovery time	VR=400V IF=40A diF/dt=1200A/μs T_{vj}=25℃		82		ns
Irrm	Diode peak reverse recovery current			15		A
Qrr	Diode reverse recovery charge			1620		nC
Trr	Diode reverse recovery time	VR=400V IF=40A diF/dt=1200A/μs T_{vj}=150℃		130		ns
Irrm	Diode peak reverse recovery current			42		A
Qrr	Diode reverse recovery charge			3520		nC

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

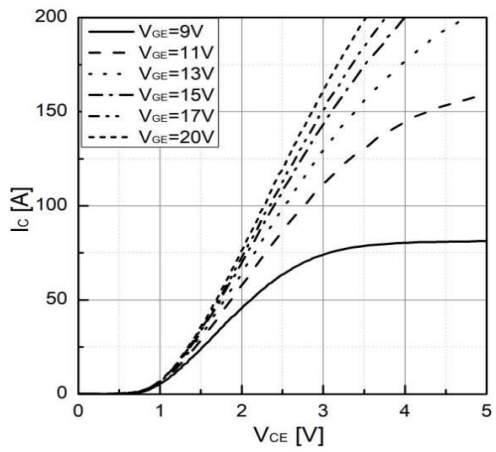


Fig 1. Typical output characteristic (T_{vj}=25℃)

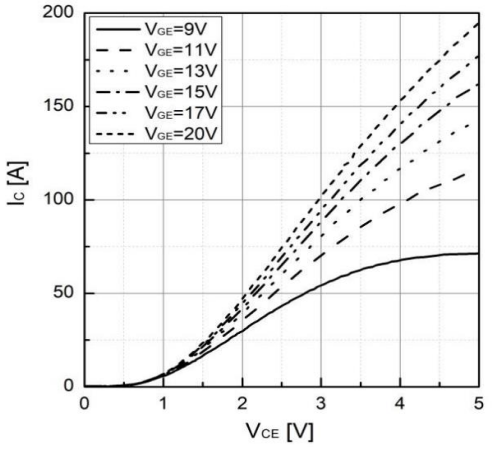


Fig 2. Typical output characteristic(T_{vj}=150℃)

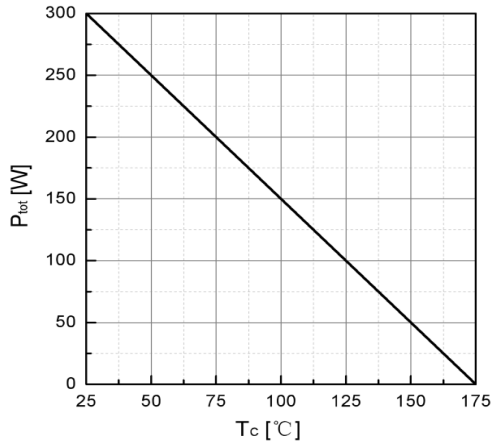


Fig 3. Power dissipation as a function of TC

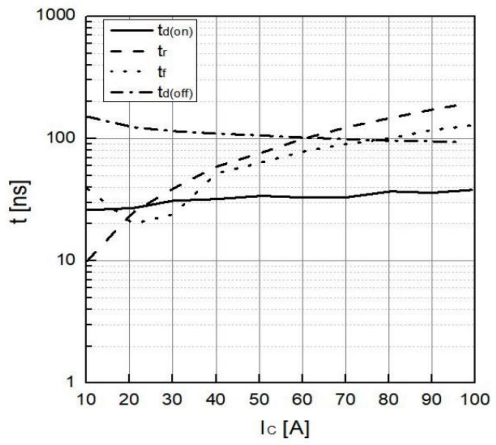


Fig 4. Typical switching time as a function of IC

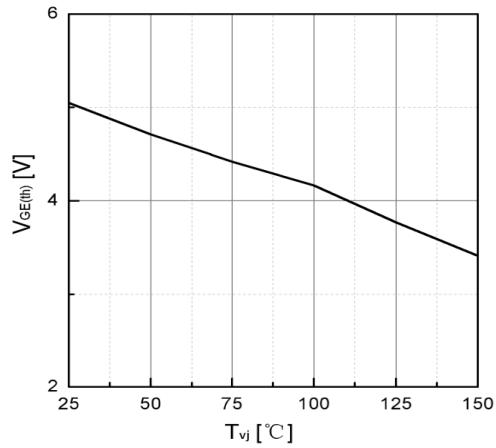


Fig 5. Typical VGE(th) as a function of T_{vj} (IC=1mA)

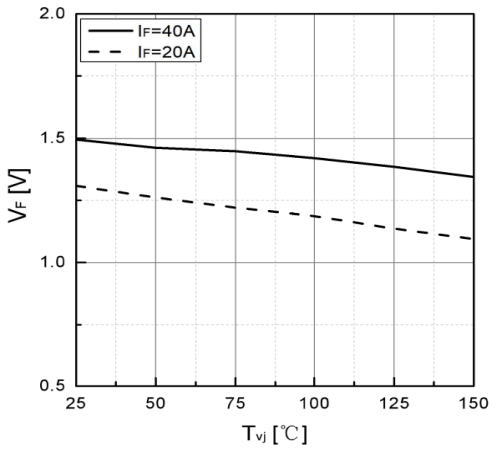


Fig 6. Typical VF as a function of T_{vj}

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

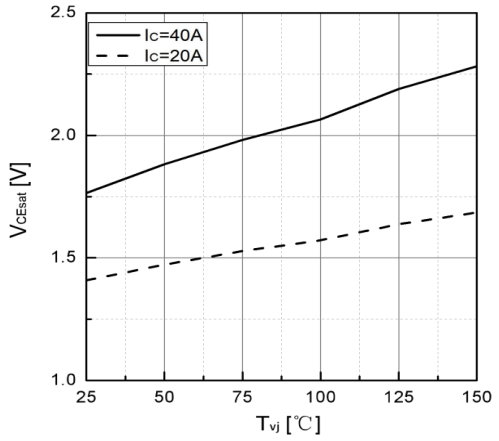


Fig 7. Typical VCEsat as a function of Tvj

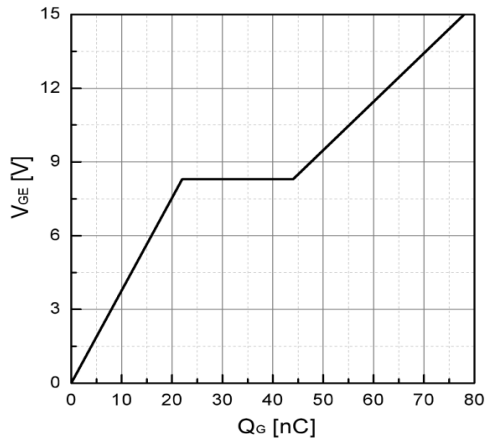


Fig 8. Typical Gate charge

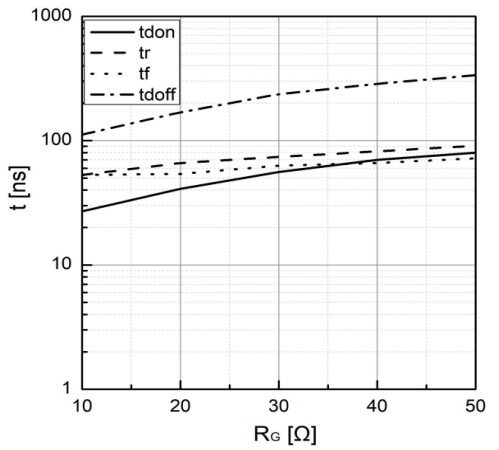


Fig 9. Typical switching times as a function of RG

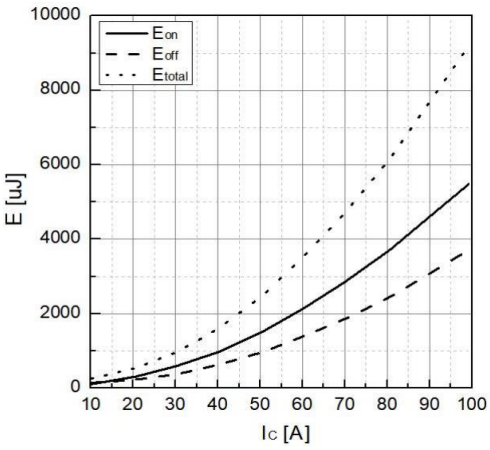


Fig 10. Typical switching energy losses as a function of IC

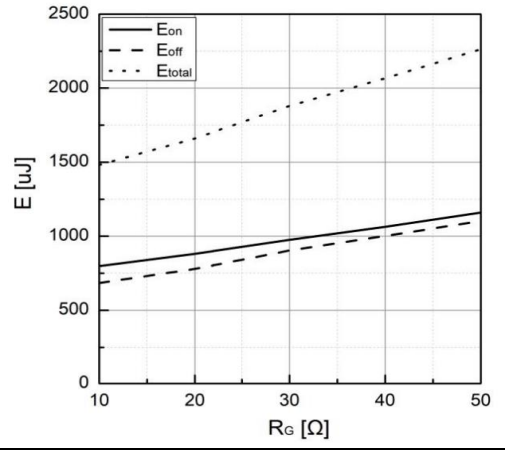


Fig 11. Typical switching energy losses as a function of RG

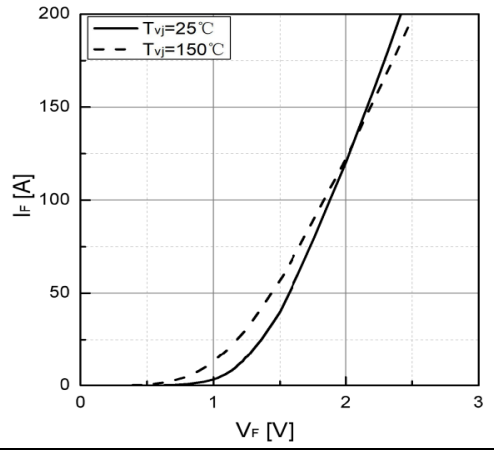


Fig 12. Typical IF as a function of VF

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

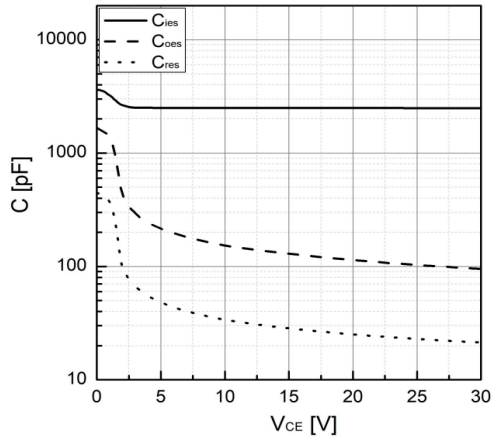


Fig 13. Typical capacitance as a function of VCE (f=1Mhz, VGE=0V)

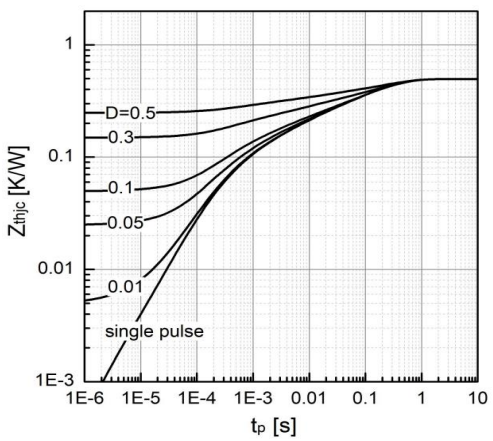
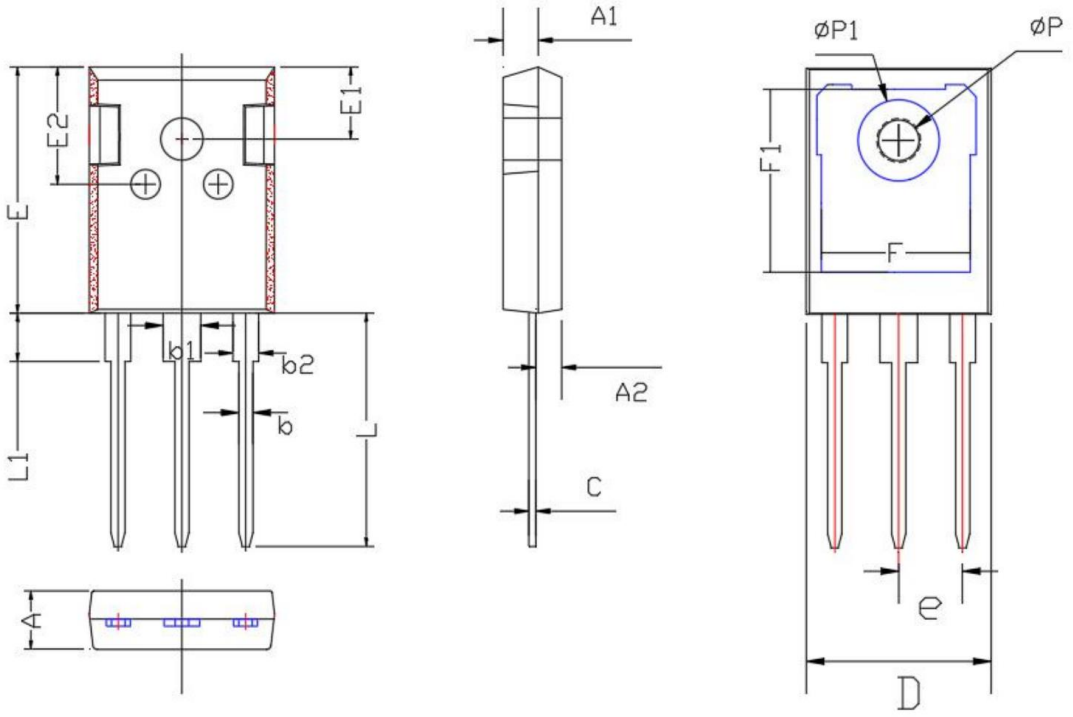


Fig 14. Transient thermal impedance of IGBT

➢ 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

DISCLAIMER

SSCSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. SSCSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICIENCE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

THE GRAPHS PROVIDED IN THIS DOCUMENT ARE STATISTICAL SUMMARIES BASED ON A LIMITED NUMBER OF SAMPLES AND ARE PROVIDED FOR INFORMATIONAL PURPOSE ONLY. THE PERFORMANCE CHARACTERISTICS LISTED IN THEM ARE NOT TESTED OR GUARANTEED. IN SOME GRAPHS, THE DATA PRESENTED MAY BE OUTSIDE THE SPECIFIED OPERATING RANGE (E.G. OUTSIDE SPECIFIED POWER SUPPLY RANGE) AND THEREFORE OUTSIDE THE WARRANTED RANGE.

OUR PRODUCT SPECIFICATIONS ARE ONLY VALID IF OBTAINED THROUGH THE COMPANY'S OFFICIAL WEBSITE, CRM SYSTEM, OR OUR SALES PERSONNEL CHANNELS. IF CHANGES OR SPECIAL VERSIONS ARE INVOLVED, THEY MUST BE STAMPED WITH A QUALITY SEAL AND MARKED WITH A SPECIAL VERSION NUMBER TO BE VALID.