

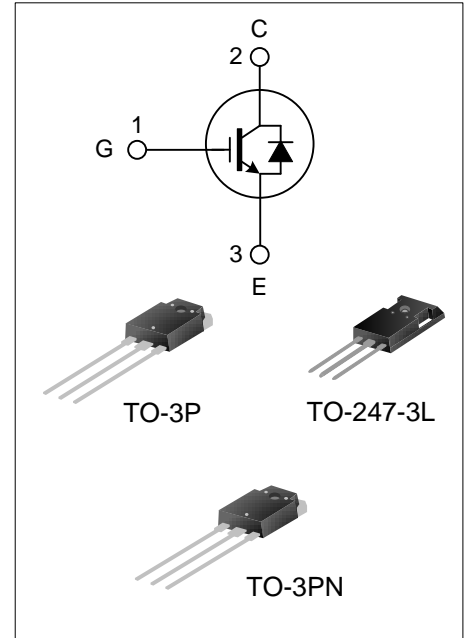
60A, 650V FIELD STOP IGBT

DESCRIPTION

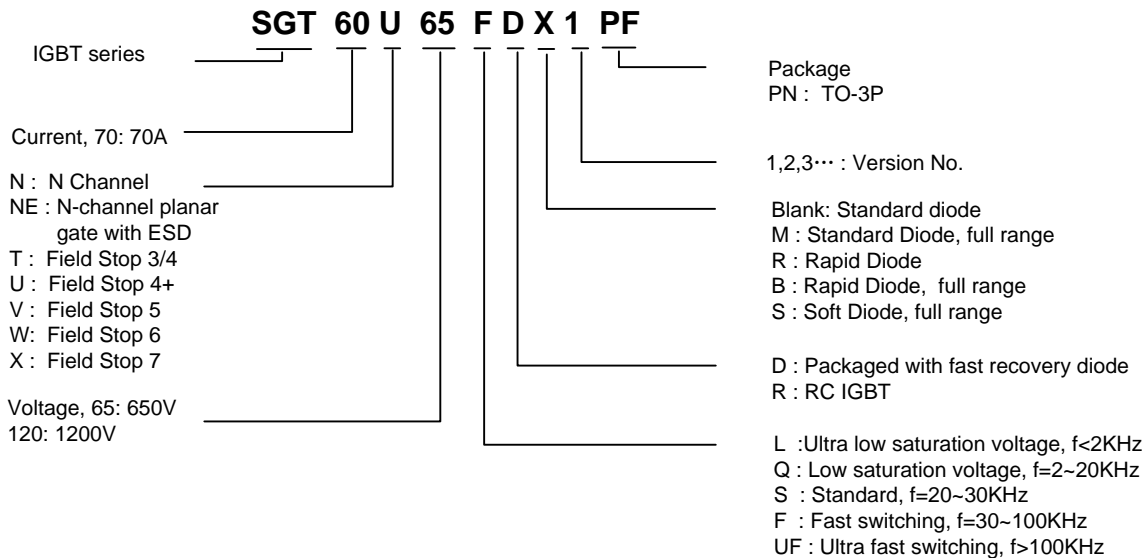
The SGT60U65FD1PN(PT)(P7) field stop IGBT adopts Silan Field Stop IV+ technology, features low conduction loss and switching loss, is applicable to UPS, SMPS and PFC fields.

FEATURES

- ◆ 60A, 650V, $V_{CE(sat)(typ.)}=2.0V@I_C=60A$
- ◆ Low conduction loss
- ◆ Fast switching
- ◆ High input impedance



NOMENCLATURE



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SGT60U65FD1PN	TO-3P	60U65FD1	Pb free	Tube
SGT60U65FD1PT	TO-3PN	60U65FD1	Pb free	Tube
SGT60U65FD1PT	TO-247-3L	60U65FD1	Pb free	Tube

ABSOLUTE MAXIMUM RATINGS (T_C=25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Ratings	Units
Collector to Emitter Voltage	V _{CE}	650	V
Gate to Emitter Voltage	V _{GE}	±20	V
Collector Current	I _C	T _C =25°C	120
		T _C =100°C	60
Pulsed Collector Current	I _{CM}	180	A
Diode current	I _F	T _C =25°C	60
		T _C =100°C	30
Power Dissipation (T _C =25°C)	P _D	280	W
Operating Junction Temperature	T _J	-55~+150	°C
Storage Temperature Range	T _{stg}	-55~+150	°C

THERMAL CHARACTERISTICS

Parameter	Symbol	Ratings	Units
Thermal Resistance, Junction to Case (IGBT)	R _{θJC}	0.45	°C/W
Thermal Resistance, Junction to Case (FRD)	R _{θJC}	1.17	°C/W

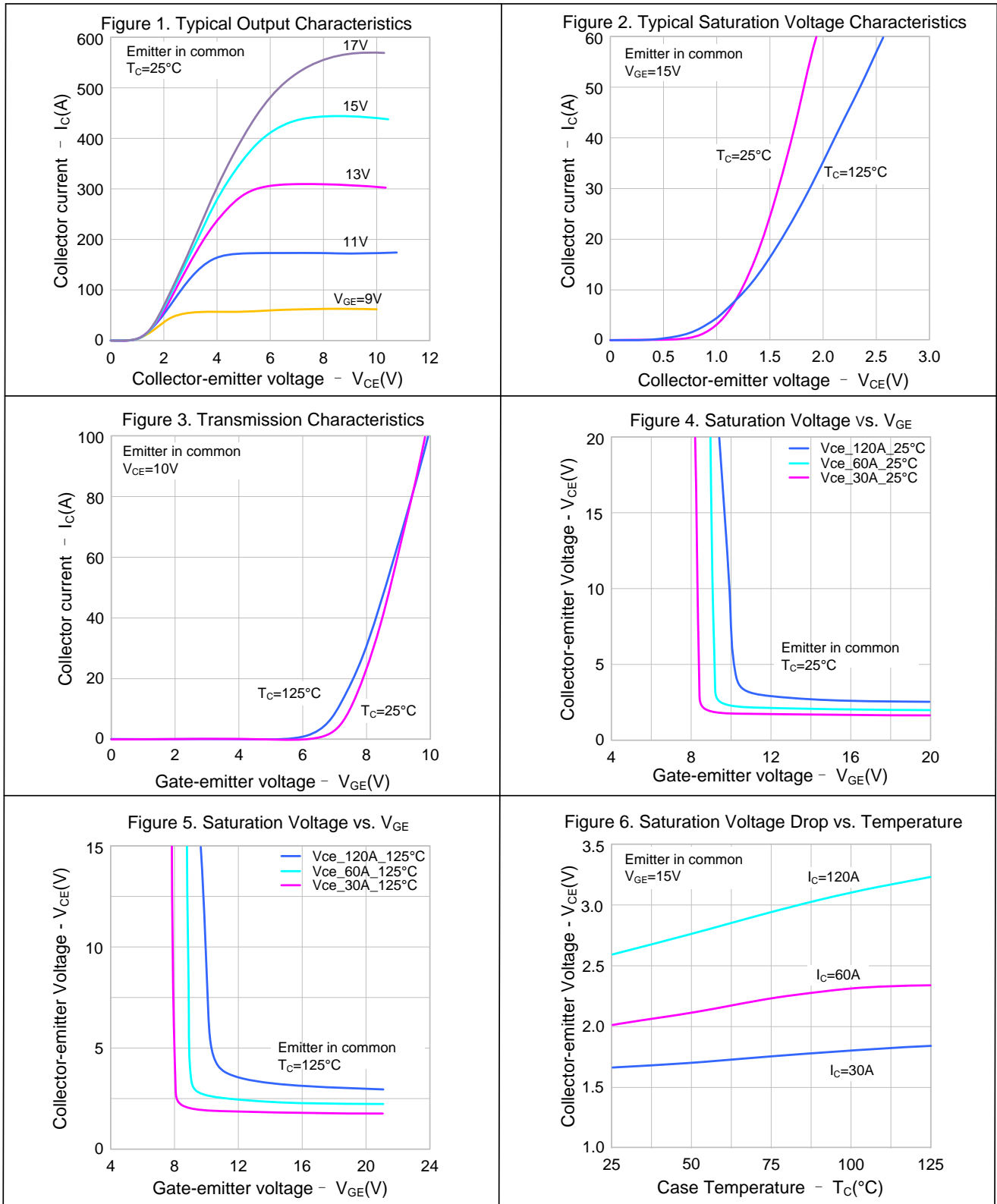
ELECTRICAL CHARACTERISTICS OF IGBT ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units
Collector to Emitter Breakdown Voltage	BV_{CE}	$V_{GE}=0V, I_C=250\mu A$	650	--	--	V
C-E Leakage Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V$	--	--	200	μA
G-E Leakage Current	I_{GES}	$V_{GE}=20V, V_{CE}=0V$	--	--	± 400	nA
G-E Threshold Voltage	$V_{GE(th)}$	$I_C=250\mu A, V_{CE}=V_{GE}$	4.0	5.0	6.5	V
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=60A, V_{GE}=15V, T_C=25^\circ\text{C}$	--	2.0	--	V
		$I_C=60A, V_{GE}=15V, T_C=125^\circ\text{C}$	--	2.5	--	V
Input Capacitance	C_{ies}	$V_{CE}=30V$	--	6730	--	pF
Output Capacitance	C_{oes}	$V_{GE}=0V$	--	132	--	
Reverse Transfer Capacitance	C_{res}	$f=1\text{MHz}$	--	62	--	
Turn-On Delay Time	$T_{d(on)}$	$V_{CE}=400V$ $I_C=60A$ $R_g=10\Omega$	--	70	--	ns
Rise Time	T_r		--	160	--	
Turn-Off Delay Time	$T_{d(off)}$		--	190	--	
Fall Time	T_f		--	140	--	
Turn-On Switching Loss	E_{on}	$V_{GE}=15V$	--	3.8	--	mJ
Turn-Off Switching Loss	E_{off}	Inductive Load	--	1.5	--	
Total Switching Loss	E_{st}		--	5.3	--	
Total Gate Charge	Q_g	$V_{CE} = 400V, I_C=60A, V_{GE} = 15V$	--	210	--	nC
Gate to Emitter Charge	Q_{ge}		--	65	--	
Gate to Collector Charge	Q_{gc}		--	70	--	

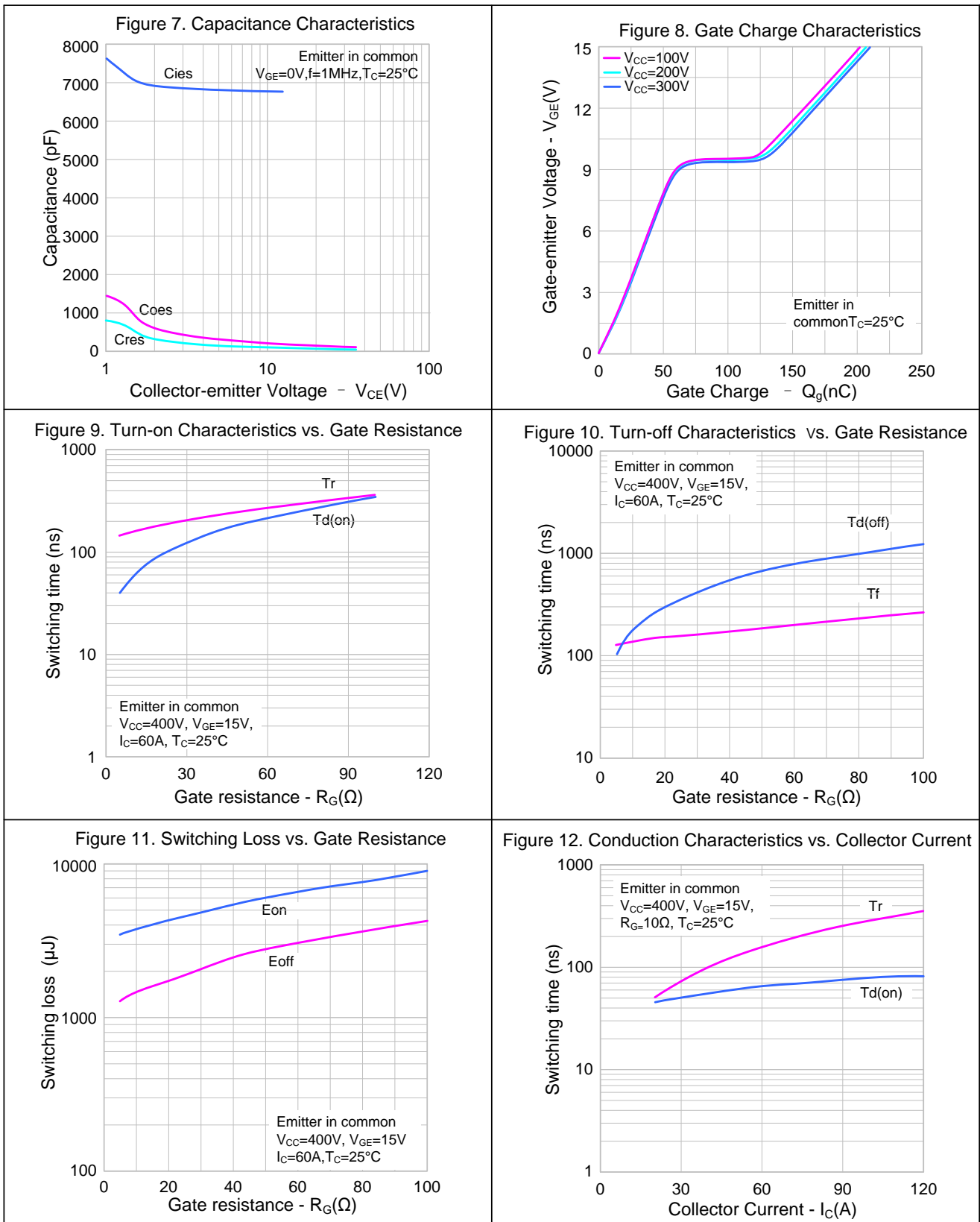
ELECTRICAL CHARACTERISTICS OF FRD ($T_C=25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units
Diode Forward Voltage	V_{FM}	$I_F=30A, T_C=25^\circ\text{C}$	--	1.97	--	V
		$I_F=30A, T_C=125^\circ\text{C}$	--	1.65	--	
Diode Reverse Recovery Time	T_{rr}	$I_{ES}=30A, di_{ES}/dt=200A/\mu s$	--	36	--	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_{ES}=30A, di_{ES}/dt=200A/\mu s$	--	80	--	nC

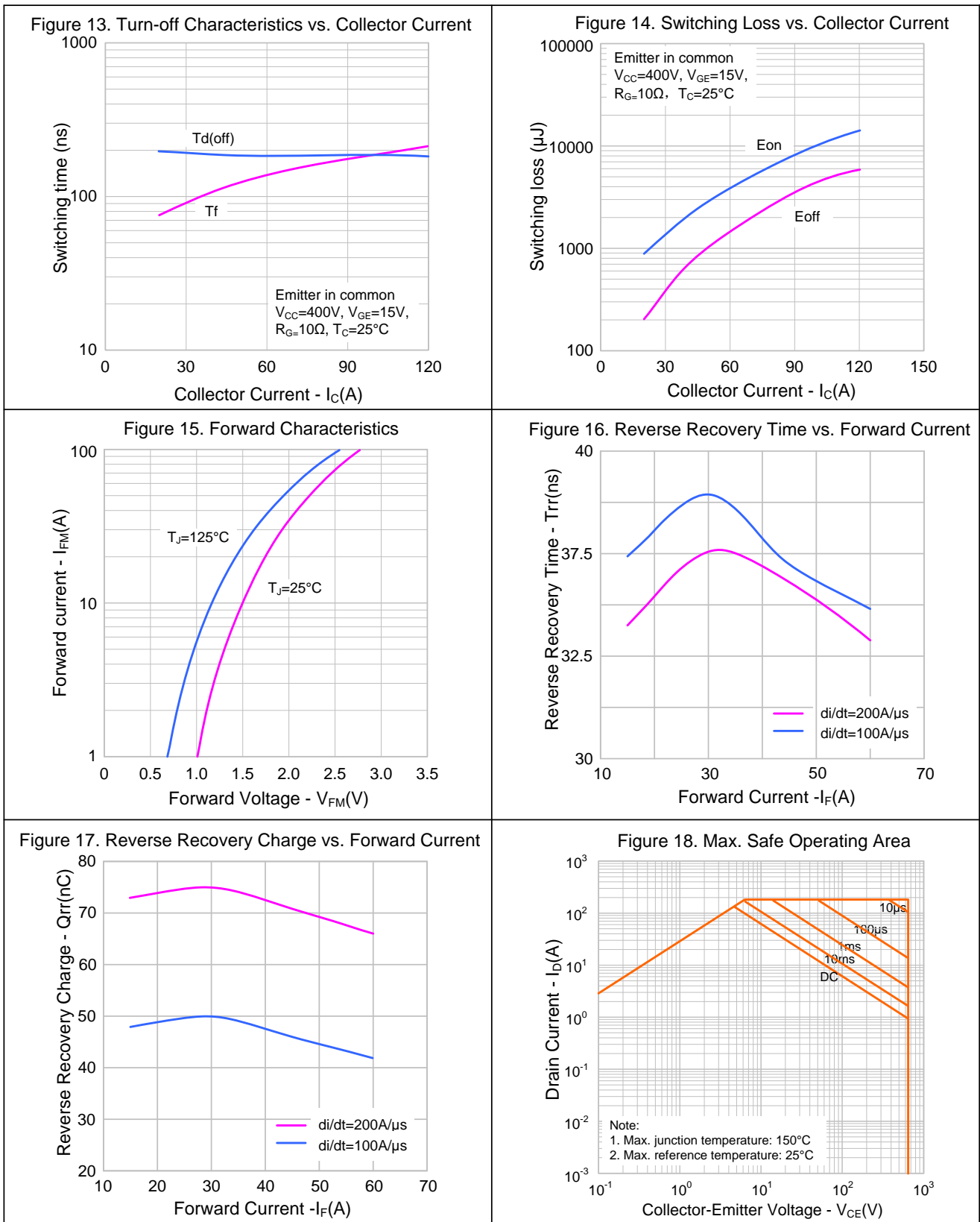
TYPICAL CHARACTERISTICS CURVE



TYPICAL CHARACTERISTICS CURVE (CONTINUED)

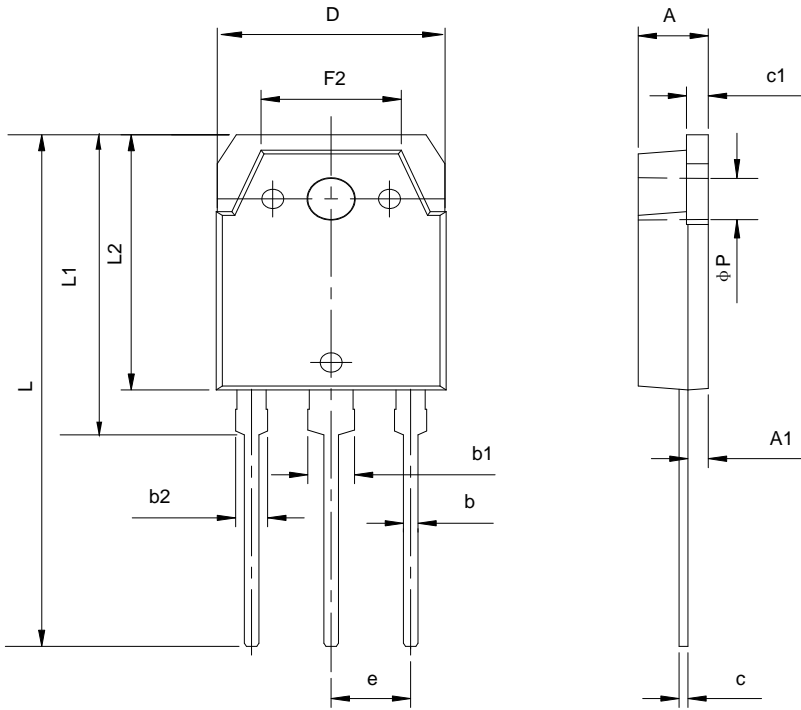


TYPICAL CHARACTERISTICS CURVE (CONTINUED)



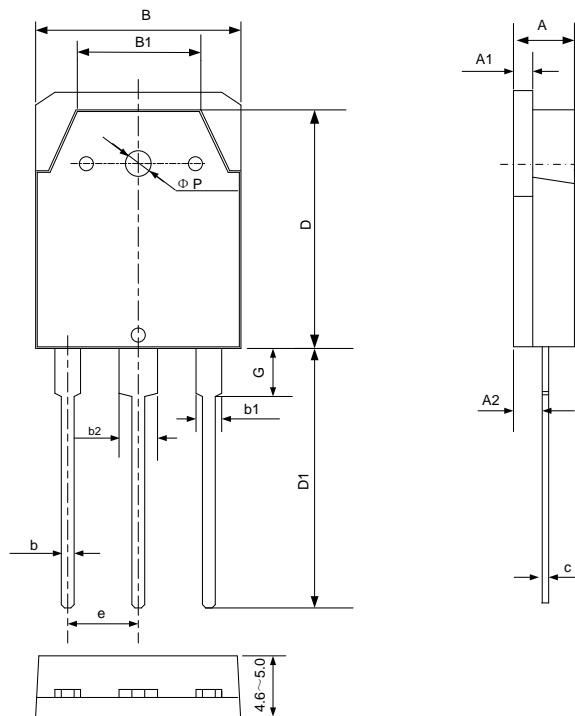
PACKAGE OUTLINE

TO-3P UNIT: mm



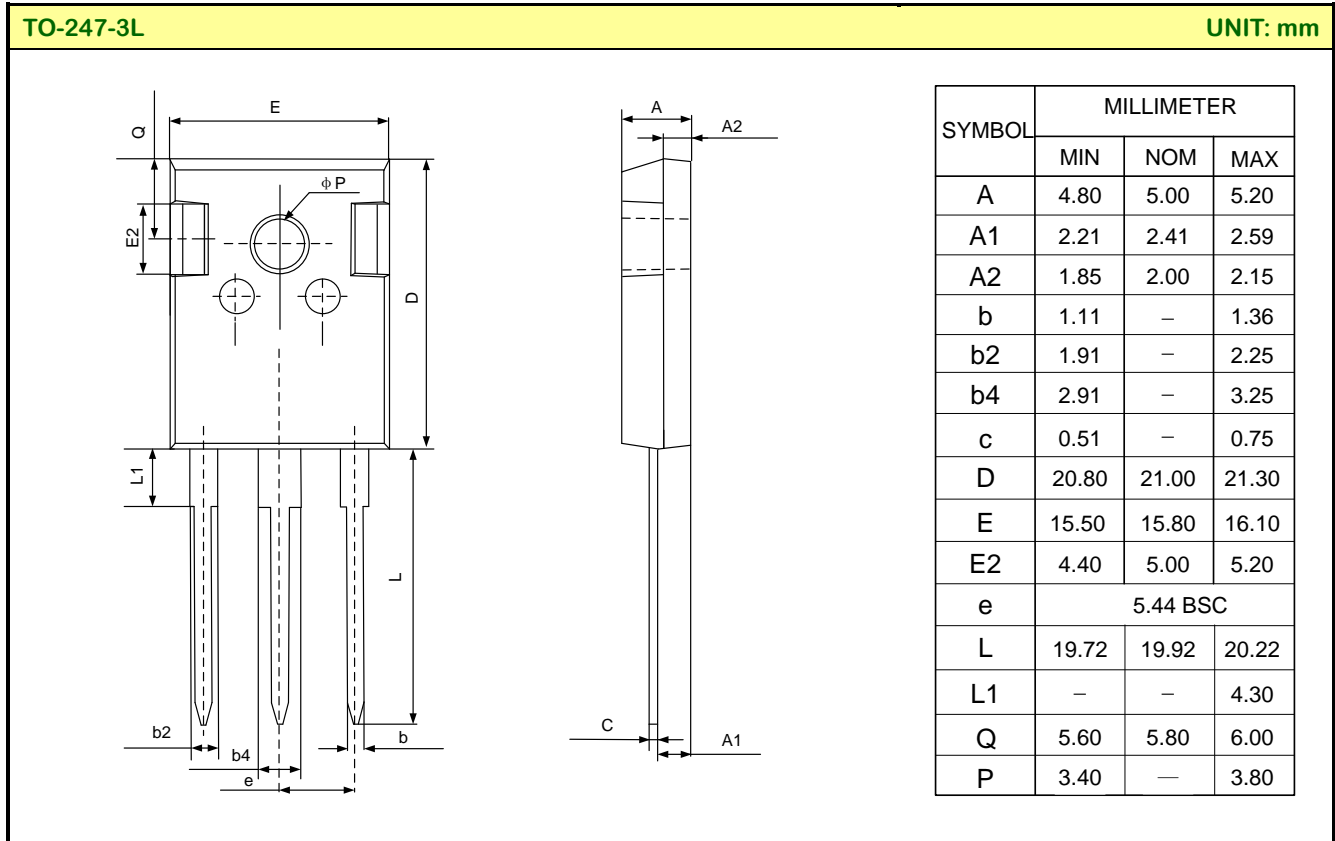
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.4	—	5.2
c1	1.2	—	1.8
A1	1.2	—	2.0
b	0.7	1.0	1.3
b1	2.7	3.0	3.3
b2	1.7	2.0	2.3
D	15.0	15.5	16.0
c	0.4	0.6	0.8
F2	8.5	—	10.0
e	5.45 TYP		
L1	22.6	—	23.6
L	39.0	—	41.5
L2	19.5	—	21.0
P	3.0	—	3.4

TO-3PN UNIT: mm



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.60	4.80	5.00
A1	1.30	1.50	1.70
A2	2.20	2.40	2.60
b	0.80	1.00	1.20
b1	1.80	2.00	2.20
b2	2.90	3.10	3.30
B	15.20	15.60	16.00
B1	9.10	9.30	9.50
c	0.50	0.60	0.70
D	18.30	18.50	18.70
D1	19.00	19.50	20.00
e	5.25	5.45	5.65
G	2.80	3.00	3.20
phi P	3.00	3.20	3.40

PACKAGE OUTLINE



Important notice :

1. The instructions are subject to change without notice!
2. Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current. Please read the instructions carefully before using our products, including the circuit operation precautions.
3. Our products are consumer electronic products or the other civil electronic products.
4. When using our products, please do not exceed the maximum rating of the products, otherwise the reliability of the whole machine will be affected. There is a certain possibility of failure or malfunction of any semiconductor product under specific conditions. The buyer is responsible for complying with safety standards and taking safety measures when using our products for system design, sample and whole machine manufacturing, so as to avoid potential failure risk that may cause personal injury or property loss.
5. It is strongly recommended to identify the trademark when buying our products. Please contact us if there is any question.
6. Product promotion is endless, our company will wholeheartedly provide customers with better products!
7. Website: <http://www.silan.com.cn>



Part No.: SGT60U65FD1PN(PT)(P7) Document Type: Datasheet
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Rev.: 1.2

Revision History:

1. Add TO-247-3L
 2. Modify I_F , increase the current of T_F
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Rev.: 1.1

Revision History:

1. Add TO-3PN
 2. Update the template of datasheet
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Rev.: 1.0

Revision History:

1. First release
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