

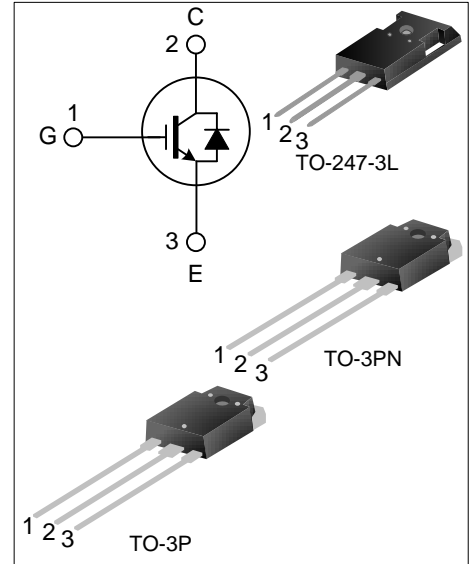
40A, 600V FIELD STOP IGBT

DESCRIPTION

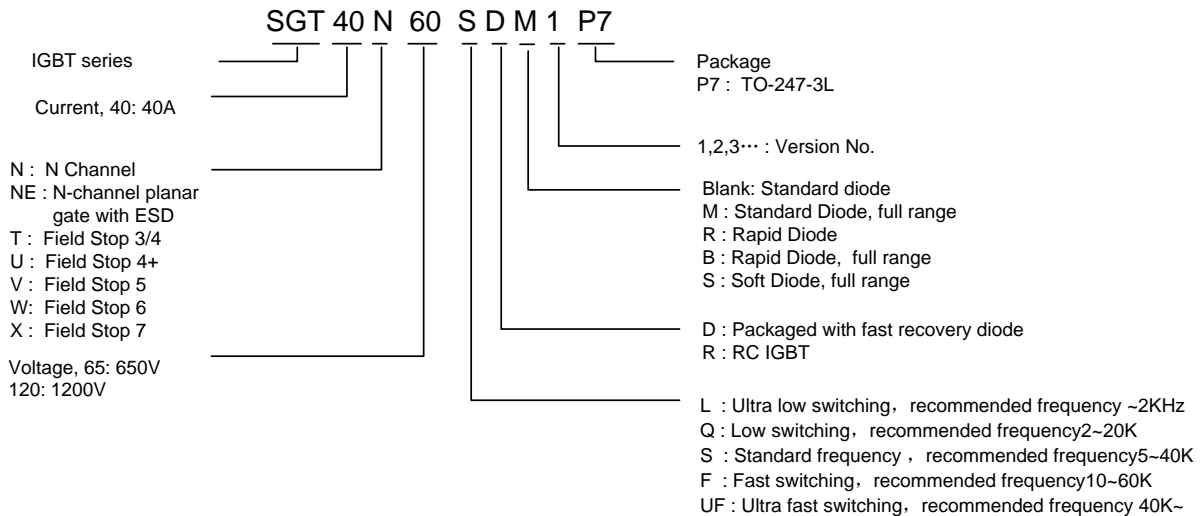
SGT40N60FD2PN(P7)(PT) using Field Stop III IGBT technology, offers the optimum performance for induction Heating, UPS, SMPS and PFC application.

FEATURES

- ◆ 40A, 600V, $V_{CE(sat)(typ.)}=1.8V@I_C=40A$
- ◆ Low conduction loss
- ◆ Fast switching
- ◆ High input impedance



NOMENCLATURE



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SGT40N60FD2PN	TO-3P	40N60FD2	Pb free	Tube
SGT40N60FD2P7	TO-247-3L	40N60FD2	Pb free	Tube
SGT40N60FD2PT	TO-3PN	40N60FD2	Pb free	Tube

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

Parameter	Symbol	Ratings	Units
Collector to Emitter Voltage	V _{CE}	600	V
Gate to Emitter Voltage	V _{GE}	±20	V
Collector Current	I _C	T _C =25°C	80
		T _C =100°C	40
Pulsed Collector Current	I _{CM}	120	A
Power Dissipation(T _C =25°C) -Derate above 25°C	P _D	380	W
		3.04	W/°C
Operating Junction Temperature Range	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}	0.33	°C/W
Thermal Resistance, Junction to Case (FRD)	R _{θJC}	1.9	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	40	°C/W

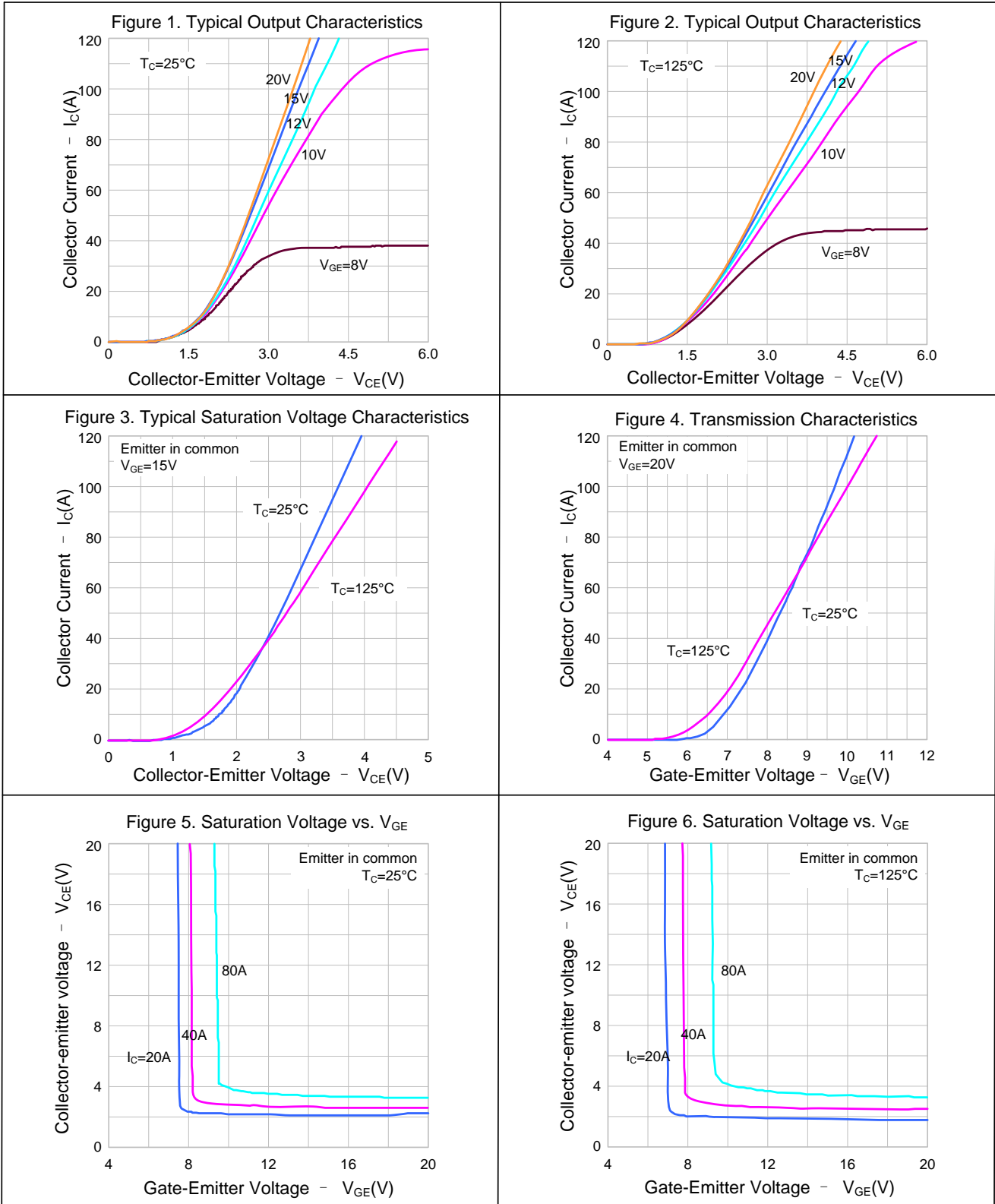
ELECTRICAL CHARACTERISTICS OF IGBT (T_C = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units
Collector to Emitter Breakdown Voltage	BV _{CE}	V _{GE} =0V, I _C =100μA	600	--	--	V
C-E Leakage Current	I _{CES}	V _{CE} =600V, V _{GE} =0V	--	--	200	μA
G-E Leakage Current	I _{GES}	V _{GE} =20V, V _{CE} =0V	--	--	±500	nA
G-E Threshold Voltage	V _{GE(th)}	I _C =250μA, V _{CE} =V _{GE}	4.0	5.0	6.5	V
Collector to Emitter Saturation Voltage	V _{CE(sat)}	I _C =40A, V _{GE} =15V	--	1.8	2.7	V
		I _C =40A, V _{GE} =15V, T _C =125°C	--	2.5	--	V
Input Capacitance	C _{ies}	V _{CE} =30V	--	1850	--	pF
Output Capacitance	C _{oes}	V _{GE} =0V	--	190	--	
Reverse Transfer Capacitance	C _{res}	f=1MHz	--	50	--	
Turn-On Delay Time	T _{d(on)}	V _{CE} =400V I _C =40A R _g =10Ω	--	16	--	ns
Rise Time	T _r		--	88	--	
Turn-Off Delay Time	T _{d(off)}		--	110	--	
Fall Time	T _f		--	96	--	
Turn-On Switching Loss	E _{on}	V _{GE} =15V Inductive Load	--	1.8	--	mJ
Turn-Off Switching Loss	E _{off}		--	0.8	--	
Total Switching Loss	E _{st}		--	2.6	--	
Total Gate Charge	Q _g	V _{CE} = 300V, I _C =40A, V _{GE} = 15V	--	100	--	nC
Gate to Emitter Charge	Q _{ge}		--	11	--	
Gate to Collector Charge	Q _{gc}		--	52	--	

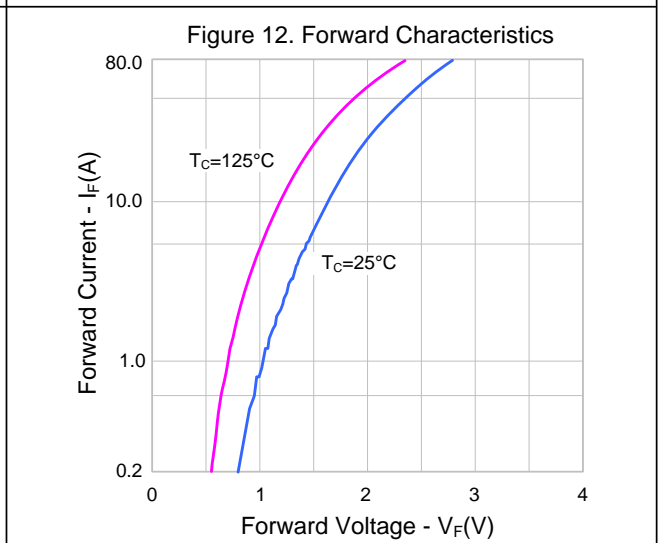
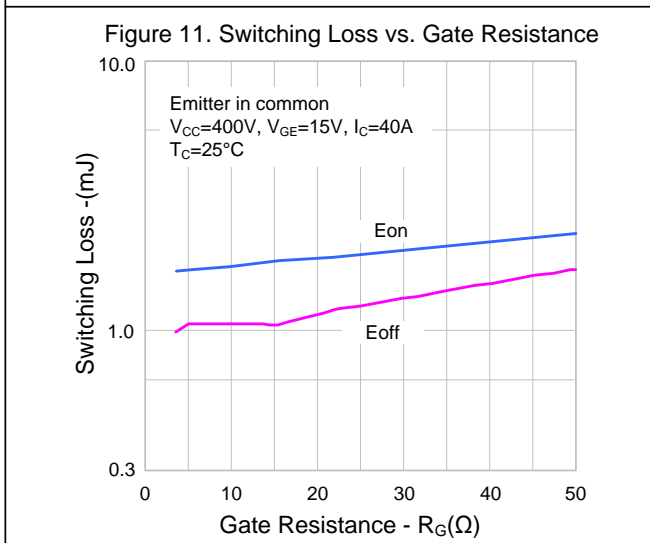
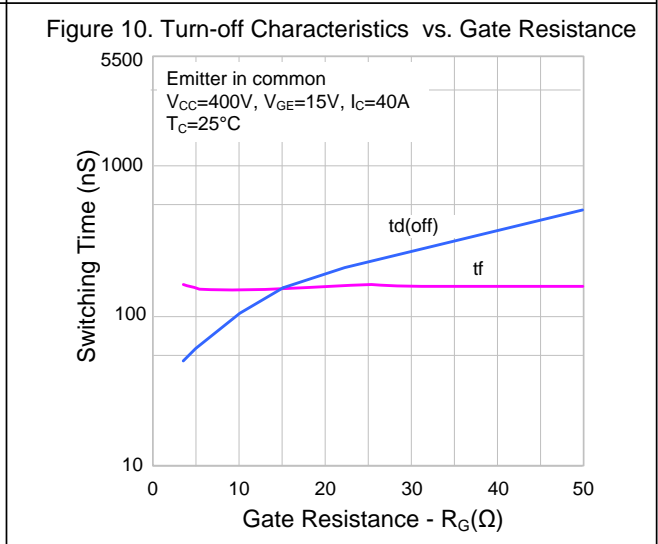
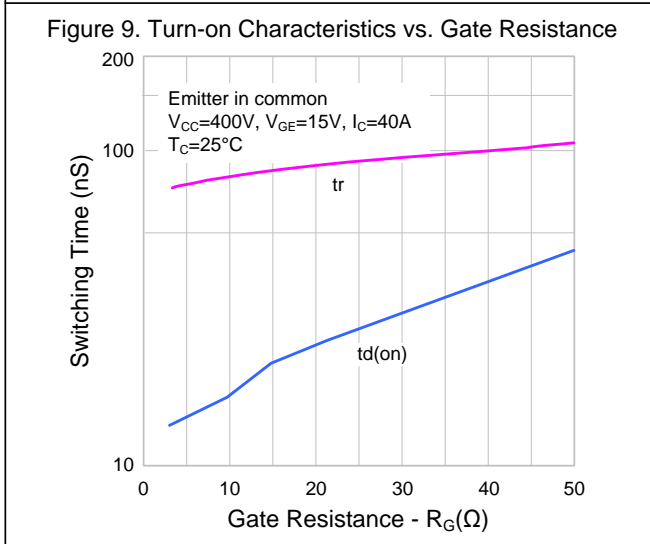
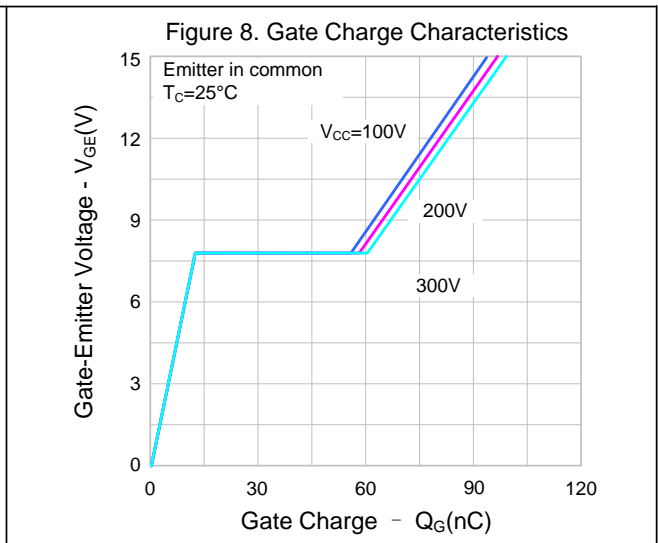
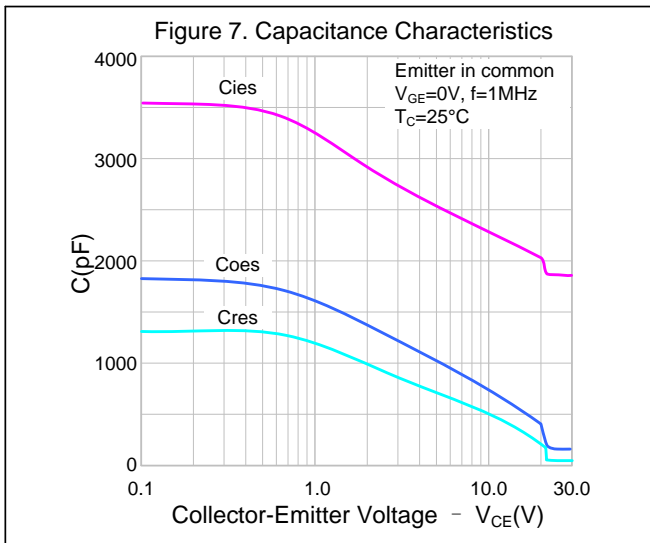
ELECTRICAL CHARACTERISTICS OF FRD (T_C=25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units
Diode Forward Voltage	V _{FM}	I _F = 20A, T _C =25°C	--	1.9	2.6	V
		I _F = 20A, T _C =125°C	--	1.5	--	
Diode Reverse Recovery Time	T _{rr}	I _{ES} =20A, dI _{ES} /dt=200A/μs	--	32	--	ns
Diode Reverse Recovery Charge	Q _{rr}	I _{ES} =20A, dI _{ES} /dt=200A/μs	--	74	--	nC

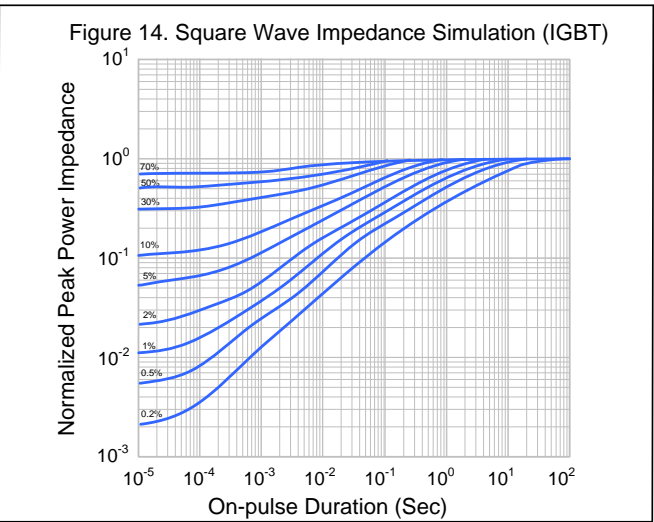
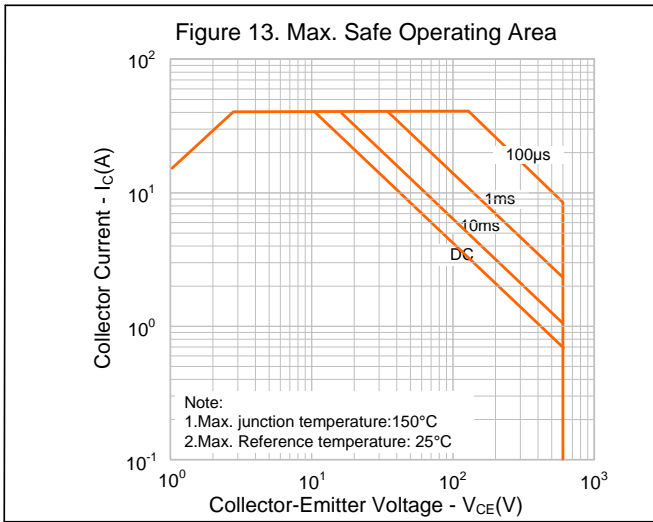
TYPICAL CHARACTERISTIC CURVES



TYPICAL CHARACTERISTIC CURVES(CONTINUED)

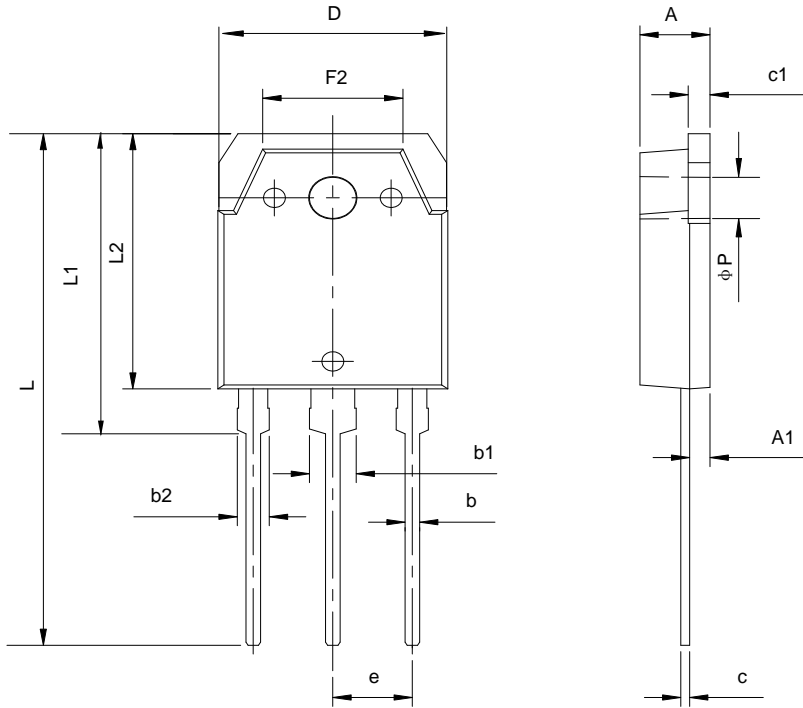


TYPICAL CHARACTERISTIC CURVES(CONTINUED)



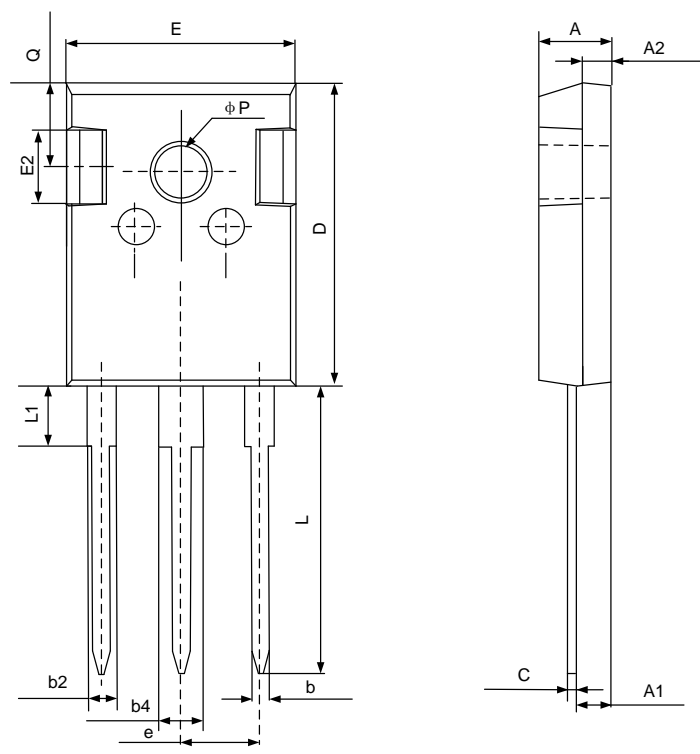
PACKAGE OUTLINE

TO-3P UNIT: mm



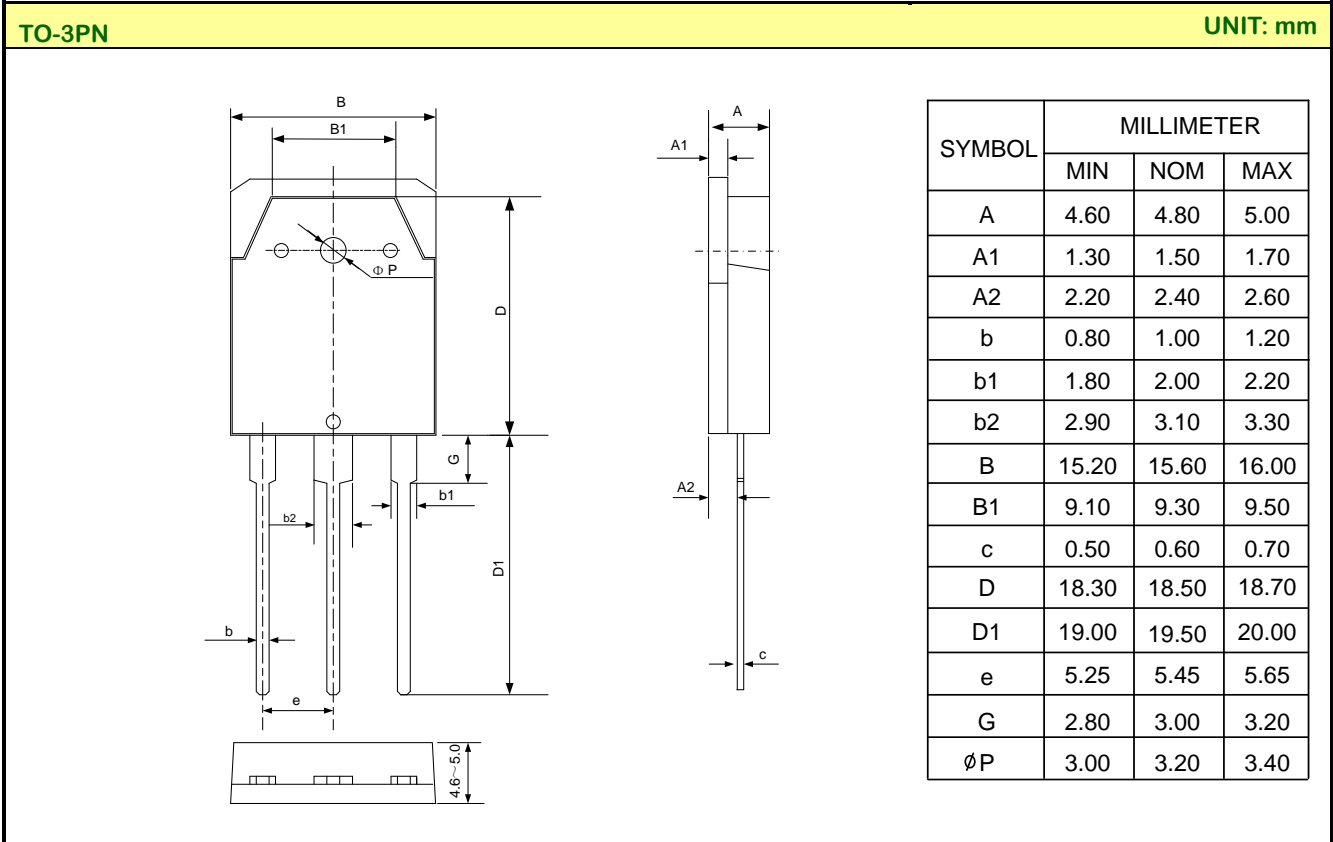
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.4	—	5.2
c1	1.2	—	1.8
A1	1.2	—	2.0
b	0.7	1.0	1.3
b1	2.7	3.0	3.3
b2	1.7	2.0	2.3
D	15.0	15.5	16.0
c	0.4	0.6	0.8
F2	8.5	—	10.0
e	5.45 TYP		
L1	22.6	—	23.6
L	39.0	—	41.5
L2	19.5	—	21.0
P	3.0	—	3.4

TO-247-3L UNIT: mm



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	—	1.36
b2	1.91	—	2.25
b4	2.91	—	3.25
c	0.51	—	0.75
D	20.80	21.00	21.30
E	15.50	15.80	16.10
E2	4.40	5.00	5.20
e	5.44 BSC		
L	19.72	19.92	20.22
L1	—	—	4.30
Q	5.60	5.80	6.00
P	3.40	—	3.80

PACKAGE OUTLINE(CONTINUED)



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.: SGT40N60FD2PN(P7)(PT) Document Type: Datasheet
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Rev.: 1.2

Revision History:

1. Add the package outline of TO-3PN
 2. Update the template of datasheet
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Rev.: 1.1

Revision History:

1. Update NOMENCLATURE
 2. Update Marking
 3. Update package outline
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Rev.: 1.0

Revision History:

1. First release
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