

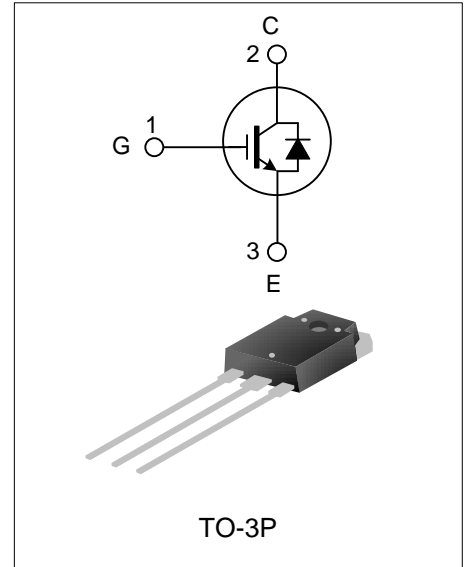
40A, 600V FIELD STOP IGBT

DESCRIPTION

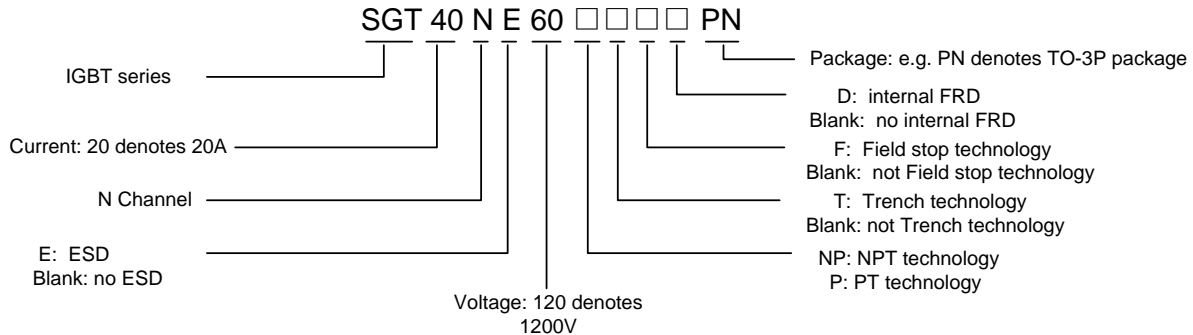
SGT40N60NPFDPN using Field Stop IGBT technology, offer the optimum performance for induction Heating, UPS, SMPS and PFC application.

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
SGT40N60NPFDPN	TO-3P	40N60NPFDP	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
Maximum Power Dissipation (T _C =25°C)	P_D	290	W

		2.32	W/°C
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)	$R_{\theta JC}$	0.24	°C/W
Thermal Resistance, Junction to Case (FRD)	$R_{\theta JC}$	1.4	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	35.5	°C/W

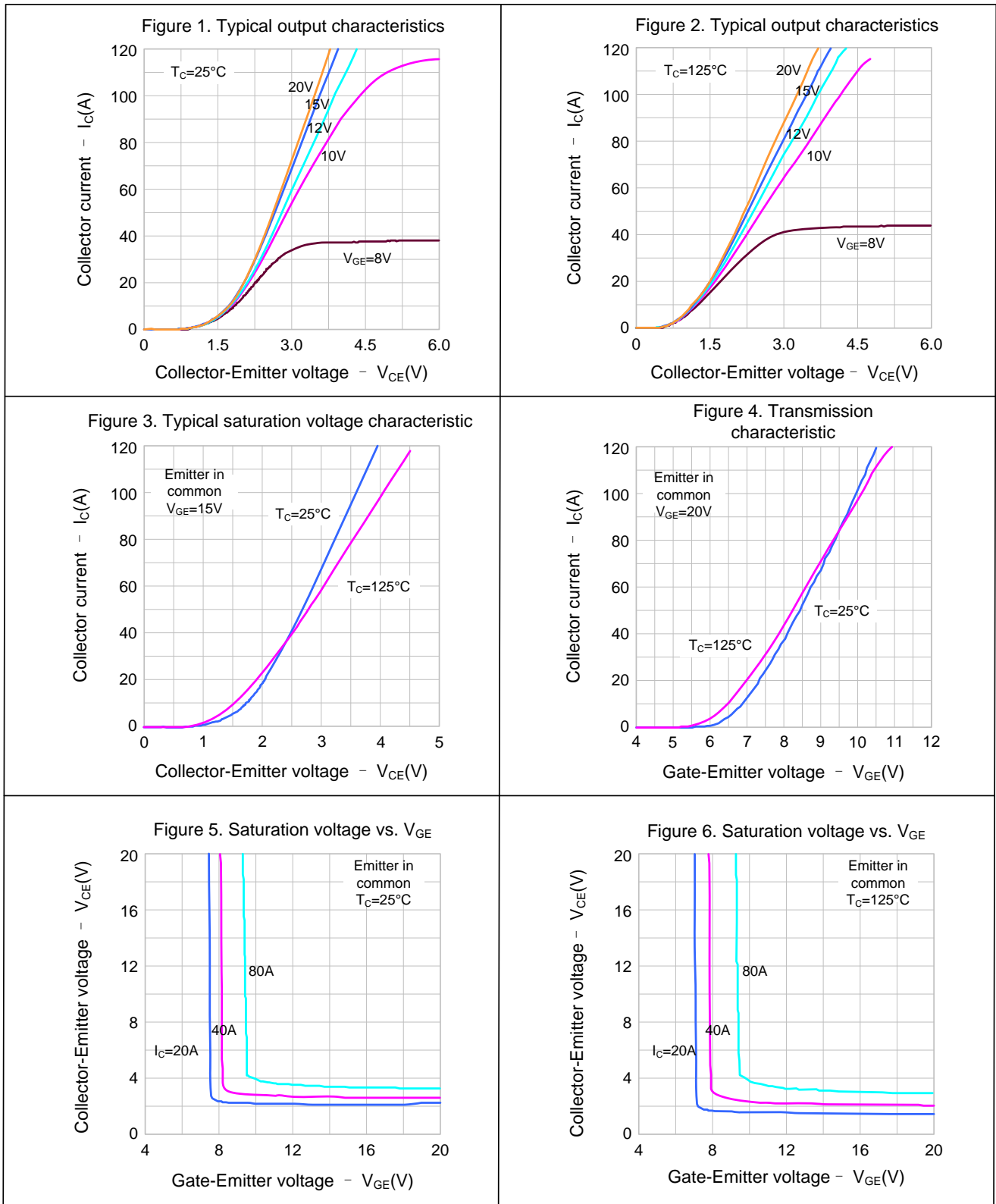
ELECTRICAL CHARACTERISTICS OF IGBT ($T_C=25^\circ\text{C}$, UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units
Collector to Emitter Breakdown Voltage	BV_{CE}	$V_{GE}=0V, I_C=250\mu A$	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	$V_{GE(th)}$	$I_C=250\mu A, V_{CE}=V_{GE}$	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
		$I_C=40A, V_{GE}=15V, T_C=125^\circ C$	--	2.1	--	V
Input Capacitance	C_{ies}	$V_{CE}=30V$	--	1850	--	pF
Output Capacitance	C_{oes}	$V_{GE}=0V$	--	180	--	
Reverse Transfer Capacitance	C_{res}	$f=1MHz$	--	50	--	
Turn-On Delay Time	$T_{d(on)}$	$V_{CE}=400V$ $I_C=40A$ $R_g=10\Omega$	--	18	--	ns
Rise Time	T_r		--	80	--	
Turn-Off Delay Time	$T_{d(off)}$		--	110	--	
Fall Time	T_f		--	105	--	
Turn-On Switching Loss	E_{on}	$V_{GE}=15V$	--	1.87	--	mJ
Turn-Off Switching Loss	E_{off}	Inductive Load	--	0.68	--	
Total Switching Loss	E_{st}		--	2.55	--	
Total Gate Charge	Q_g	$V_{CE}=300V, I_C=20A,$ $V_{GE}=15V$	--	100	--	nC
Gate to Emitter Charge	Q_{ge}		--	11	--	
Gate to Collector Charge	Q_{gc}		--	52	--	

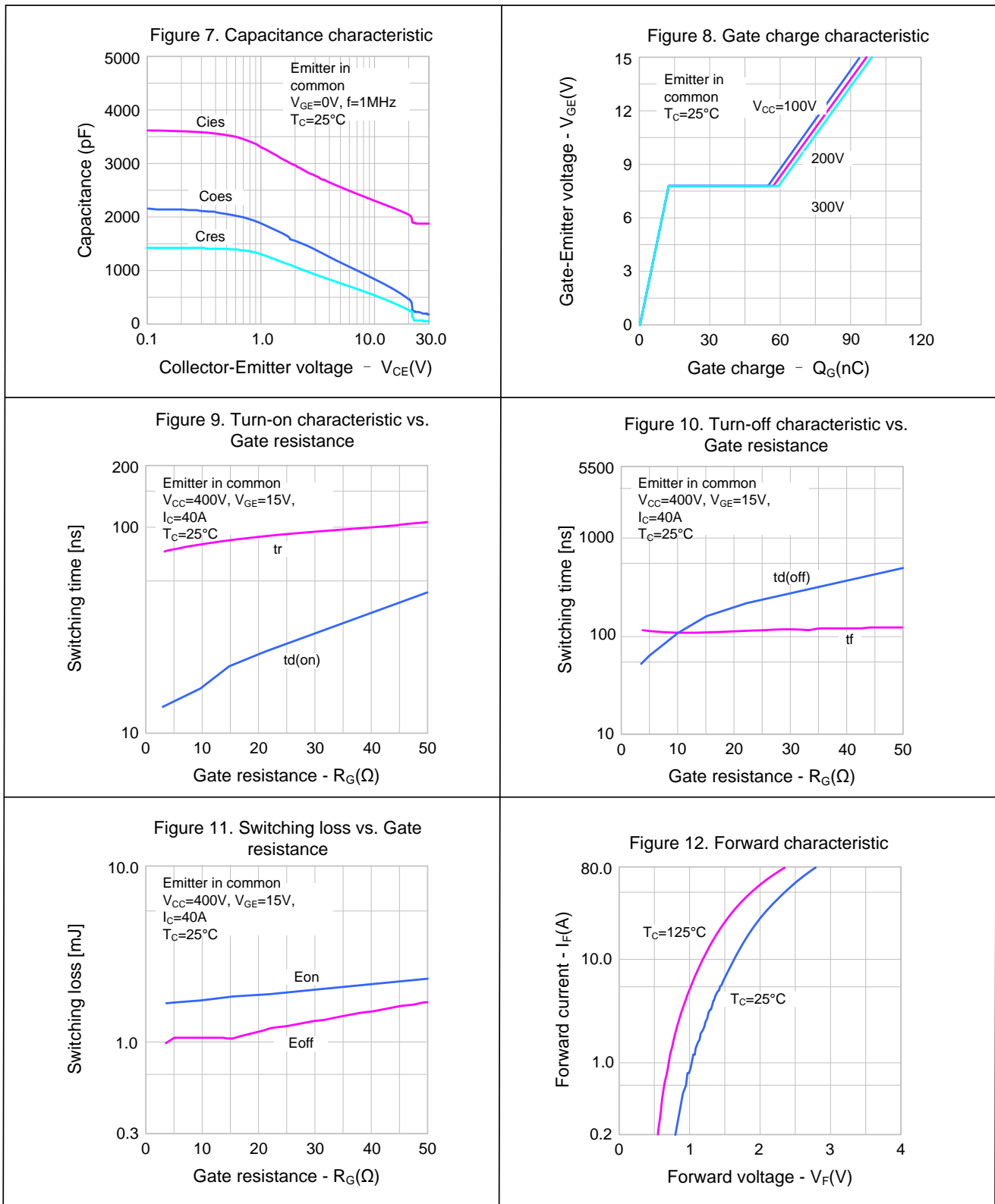
ELECTRICAL CHARACTERISTICS OF FRD ($T_C=25^\circ\text{C}$, UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units
Diode Forward Voltage	V_{fm}	$I_F=20A, T_C=25^\circ C$	--	1.9	2.6	V
		$I_F=20A, T_C=125^\circ C$	--	1.5	--	
Diode Reverse Recovery Time	T_{rr}	$I_{ES}=20A, dI_{ES}/dt=200A/\mu s$	--	32	--	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_{ES}=20A, dI_{ES}/dt=200A/\mu s$	--	74	--	nC

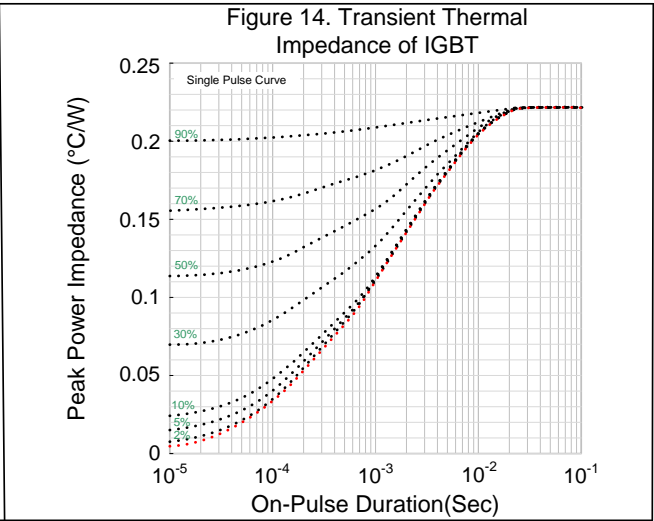
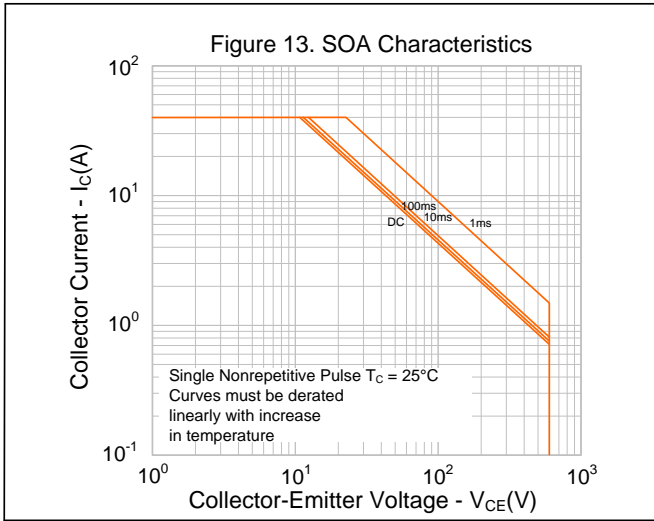
TYPICAL CHARACTERISTICS CURVE



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

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>

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Rev.: 1.4

Revision History:

1. Update curve template
 2. Update package outline
 3. Update important notice
 4. Modify operating junction temperature and storage temperature range
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Rev.: 1.3

Revision History:

1. Modify the Max Value of Junction Temperature
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Rev.: 1.2

Revision History:

1. Modify the electrical characteristic of IGBT
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Rev.: 1.1

Revision History:

1. Add pin No.
 2. Modify the package outline of TO-3P
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Rev.: 1.0

Revision History:

1. First release
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