

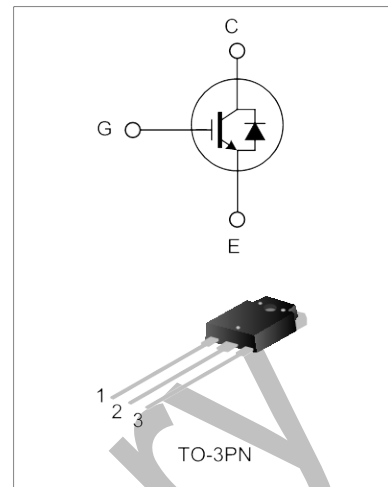
40A, 600V FIELD STOP IGBT

DESCRIPTION

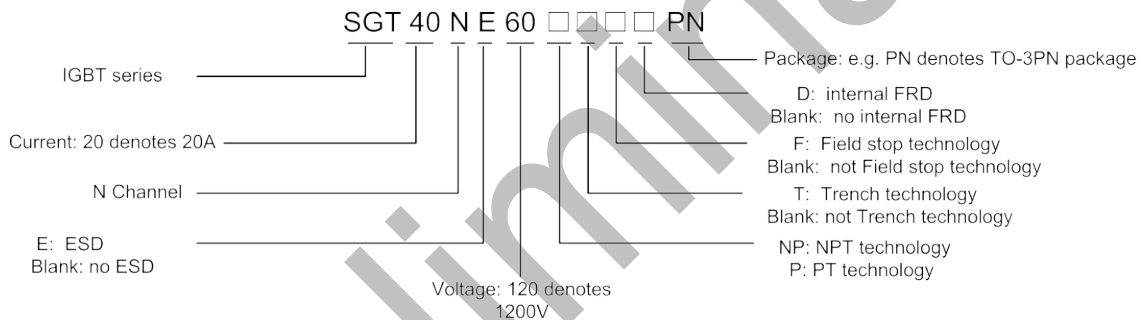
SGT40N60NPFDPN using Field Stop IGBT technology, offer the optimum performance for induction Heating, UPS, SMPS and PFC application.

FEATURES

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



NOMENCLATURE



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SGT40N60NPFDPN	TO-3PN	40N60NPFDP	Pb free	Tube

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ 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	$T_C=25^\circ\text{C}$	80
		$T_C=100^\circ\text{C}$	40
Pulsed Collector Current	I_{CM}	120	A
Maximum Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	290	W
		2.32	W/ $^\circ\text{C}$
Operating Junction Temperature	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 ~ +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Parameter	Symbol	Ratings	Units
Thermal Resistance, Junction to Case (IGBT)	$R_{\theta JC}$	0.24	$^{\circ}C/W$
Thermal Resistance, Junction to Case (FRD)	$R_{\theta JC}$	1.4	$^{\circ}C/W$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	35.5	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS OF IGBT ($T_C = 25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units
Collector to Emitter Breakdown Voltage	BV_{CE}	$V_{GE}=0V, I_C=100\mu A$	600	--	--	V
C-E Leakage Current	I_{CES}	$V_{CE}=630V, V_{GE}=0V$	--	--	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	$V_{CE(sat)}$	$I_C=40A, V_{GE}=15V$	--	1.8	2.5	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 ($T_C = 25^{\circ}C$ 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

Figure 1. Typical output characteristics

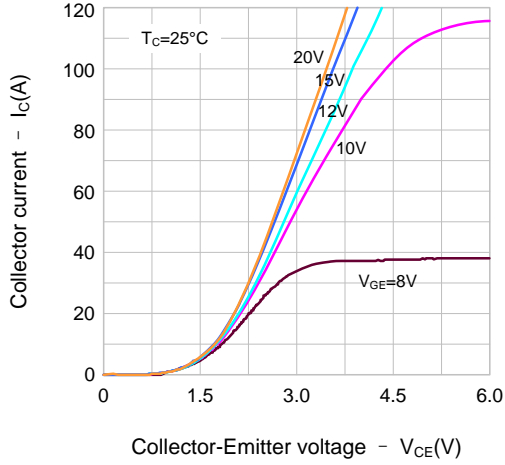


Figure 2. Typical output characteristics

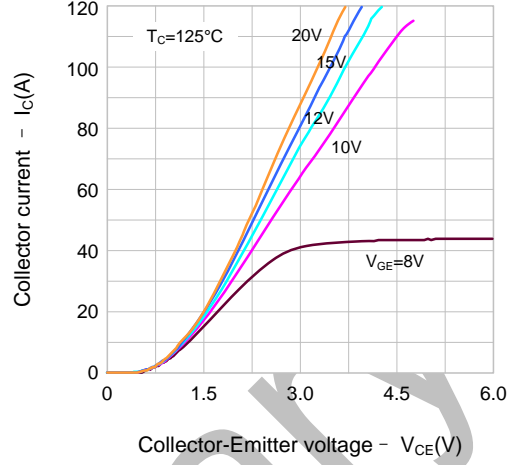


Figure 3. Typical saturation voltage characteristic

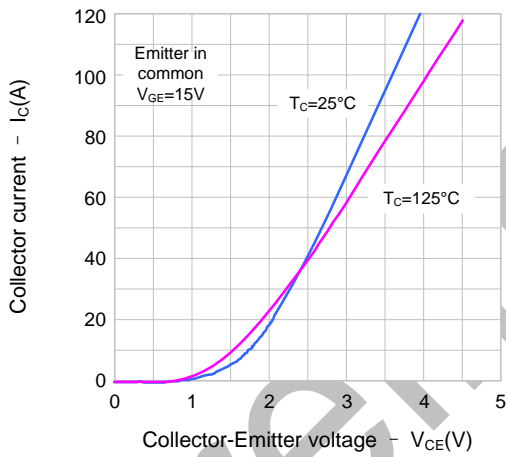


Figure 4. Transmission characteristic

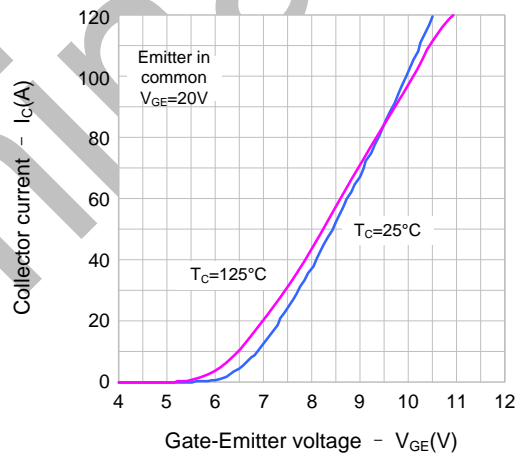


Figure 5. Saturation voltage vs. Vge

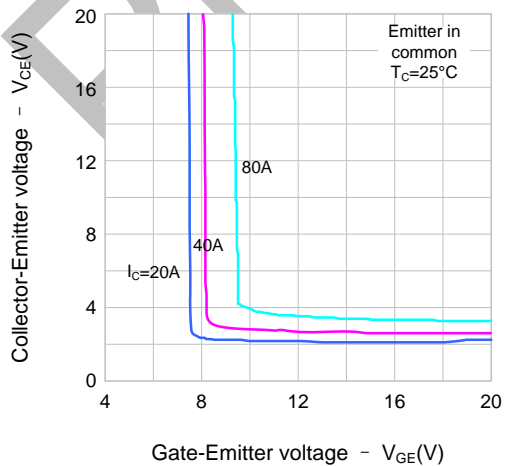
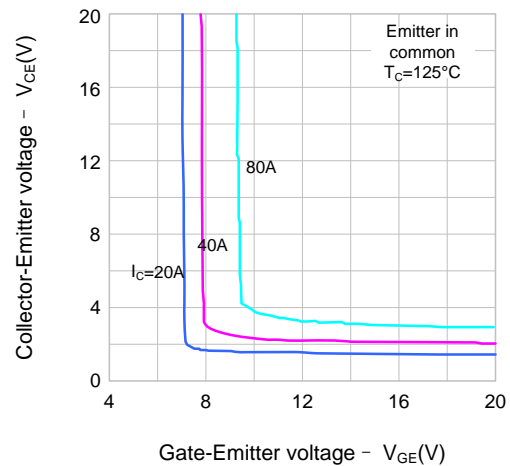
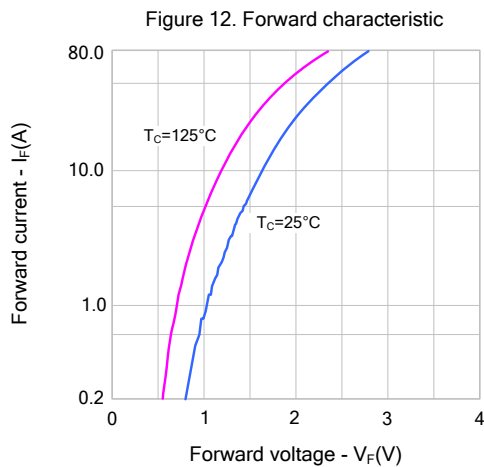
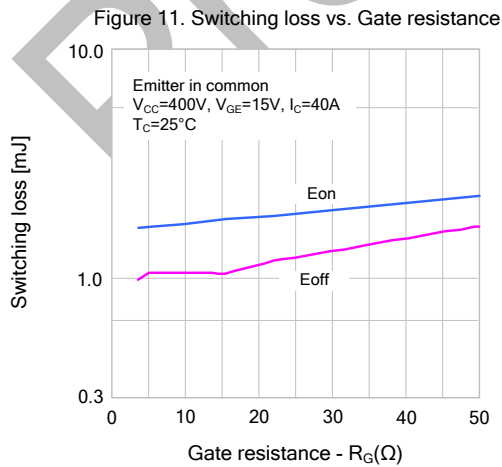
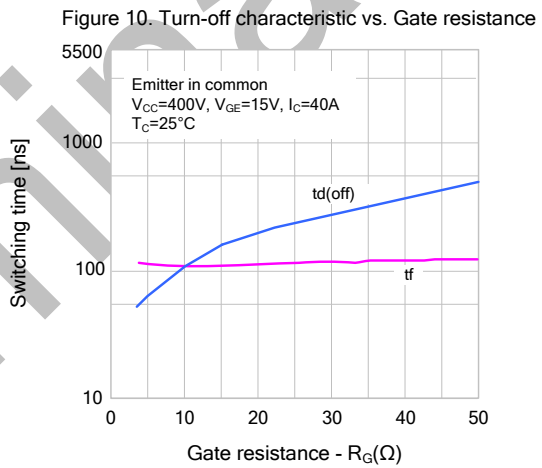
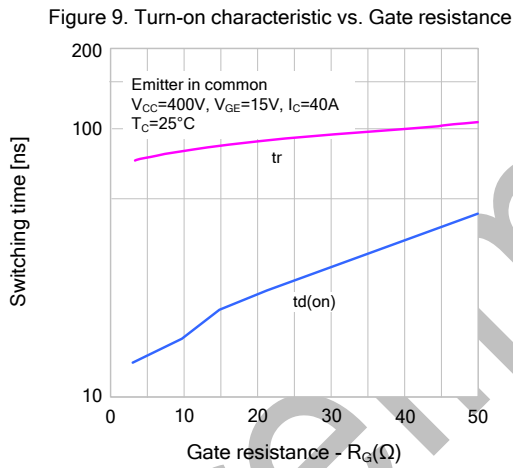
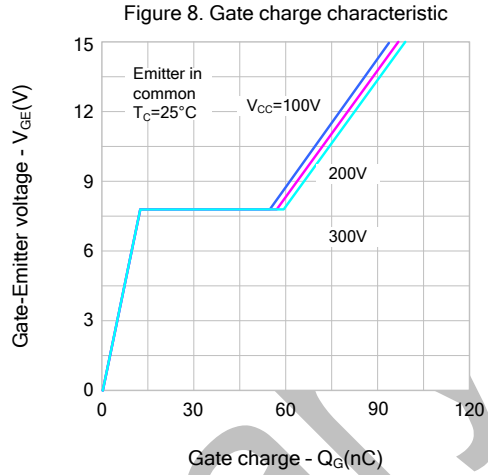
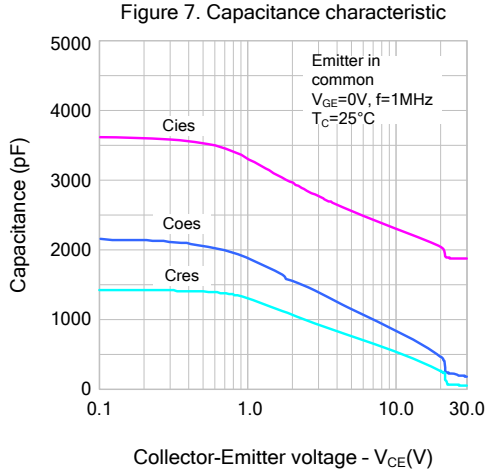


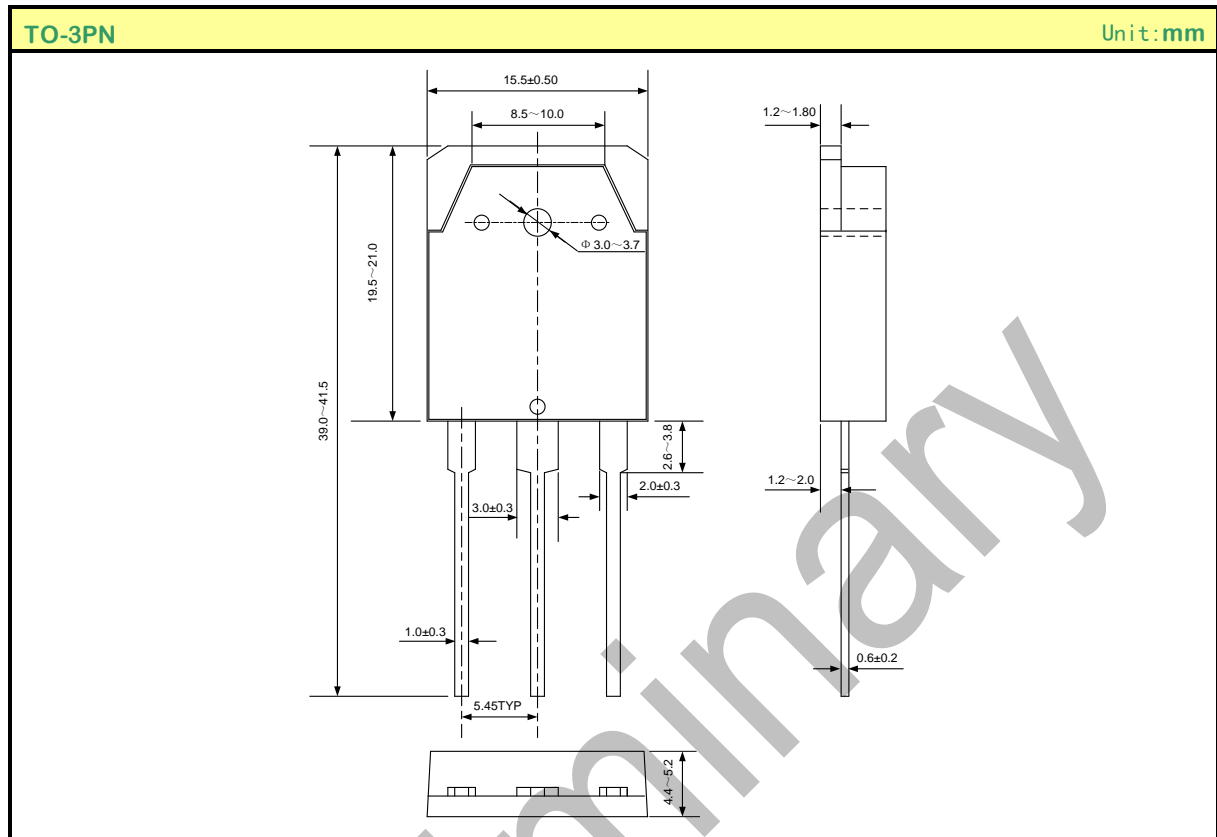
Figure 6. Saturation voltage vs. Vge



TYPICAL CHARACTERISTICS CURVE (CONTINUED)



PACKAGE OUTLINE



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