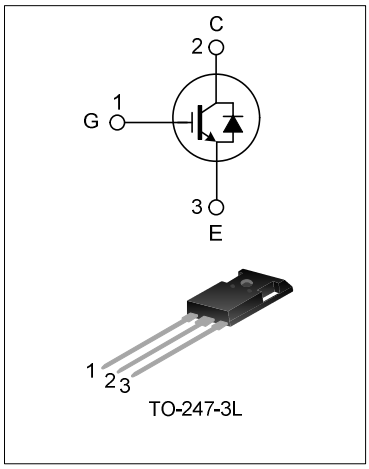
40A, 600V IGBT

DESCRIPTION

SGT40N60FD1P7 using Punch Through 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

SGT 40 * 60 * * * P7

- **IGBT series**
- **Current**
  - **N: N-channel planar gate**
  - **NE: N-channel planar gate with ESD**
  - **T: N-channel trench gate**
- **Voltage**
- **L : Low saturation voltage**
  S : Standard
  Q : Fast switching
  F : Super fast switching
  UF : Ultra fast switching
- **D : Packaged with fast recovery diode**
  R : Integrated with freewheeling diode
- **1,2,3··· : Version No.**
- **Package**

ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SGT40N60FD1P7	TO-247-3L	40N60FD1	Halogen free	Tube

ABSOLUTE MAXIMUM RATINGS (T_C = 25°, unless otherwise noted)

Characteristics		Symbol	Ratings	Units
Collector to Emitter Voltage		V_{CE}	600	V
Gate to Emitter Voltage		V_{GE}	±20	V
Collector Current	T_C=25°C	I_C	80	A
	T_C=100°C		40	
Pulsed Collector Current		I_{CM}	120	A
Maximum Power Dissipation (T_C=25°C)		P_D	290	W
-Reduction per degree Celsius above 25°C			2.32	W/°C
Operating Junction Temperature		T_J	-55～+150	°C
Storage Temperature Range		T_{stg}	-55～+150	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings	Units
Thermal Resistance, Junction to Case (IGBT)	$R_{\theta JC}$	0.52	°C/W
Thermal Resistance, Junction to Case (FRD)	$R_{\theta JC}$	1.9	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	°C/W

ELECTRICAL CHARACTERISTICS OF IGBT (T_C = 25°C unless otherwise noted)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Units
Collector to Emitter Breakdown Voltage	BV_{CE}	V_{GE}=0V,I_C=100uA	600	--	--	V
C-E Leakage Current	I_{CES}	V_{CE}=600V,V_{GE}=0V	--	--	200	uA
G-E Leakage Current	I_{GES}	V_{GE}=20V,V_{CE}=0V	--	--	±500	nA
GateThreshold Voltage	$V_{GE(th)}$	I_C=250uA,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 V_{GE}=0V f=1MHz	--	1850	--	pF
Output Capacitance	C_{oes}		--	190	--	
Reverse Transfer Capacitance	C_{res}		--	50	--	
Turn-On Delay Time	$T_{d(on)}$	V_{CE}=400V I_C=40A R_g=10Ω V_{GE}=15V Inductive Load,	--	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}		--	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)

Characteristics	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