STGFW40V60DF, STGW40V60DF, STGWT40V60DF

Trench gate field-stop IGBT, V series 600 V, 40 A very high speed

Datasheet - production data

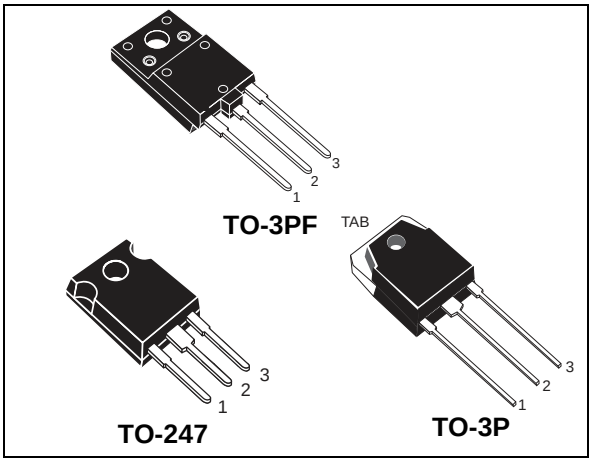
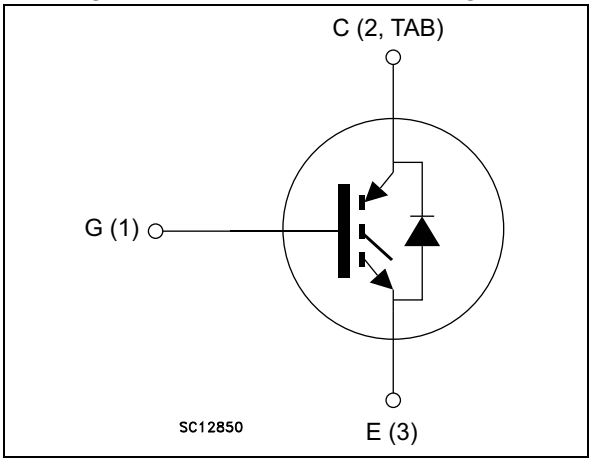


Figure 1. Internal schematic diagram



Features

- Maximum junction temperature: T_J = 175 °C
- Tail-less switching off
- $V_{CE(sat)}$ = 1.8 V (typ.) @ I_C = 40 A
- Tight parameters distribution
- Safe paralleling
- Low thermal resistance
- Very fast soft recovery antiparallel diode

Applications

- Photovoltaic inverters
- Uninterruptible power supply
- Welding
- Power factor correction
- Very high frequency converters

Description

This device is an IGBT developed using an advanced proprietary trench gate field-stop structure. The device is part of the V series of IGBTs, which represent an optimum compromise between conduction and switching losses to maximize the efficiency of very high frequency converters. Furthermore, a positive $V_{CE(sat)}$ temperature coefficient and very tight parameter distribution result in safer paralleling operation.

Table 1. Device summary

Order code	Marking	Package	Packaging
STGFW40V60DF	GFW40V60DF	TO-3PF	Tube
STGW40V60DF	GW40V60DF	TO-247	Tube
STGWT40V60DF	GWT40V60DF	TO-3P	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value		Unit
		TO-247 TO-3P	TO-3PF	
V_{CES}	Collector-emitter voltage (V_{GE} = 0)	600		V
I_C	Continuous collector current at T_C = 25 °C	80		A
I_C	Continuous collector current at T_C = 100 °C	40		A
I_{CP}(1)	Pulsed collector current	160		A
V_{GE}	Gate-emitter voltage	±20		V
I_F	Continuous forward current at T_C = 25 °C	80		A
I_F	Continuous forward current at T_C = 100 °C	40		A
I_{FP}(1)	Pulsed forward current	160		A
P_{TOT}	Total dissipation at T_C = 25 °C	283	62.5	W
V_{ISO}	Insulation withstand voltage (RMS) from all three leads to external heat sink (t = 1 s; Tc = 25 °C)		3.5	kV
T_{STG}	Storage temperature range	- 55 to 150		°C
T_J	Operating junction temperature	- 55 to 175		°C

1. Pulse width limited by maximum junction temperature

Table 3. Thermal data

Symbol	Parameter	Value		Unit
		TO-247 TO-3P	TO-3PF	
R_{thJC}	Thermal resistance junction-case IGBT	0.53	2.4	°C/W
R_{thJC}	Thermal resistance junction-case diode	1.14		°C/W
R_{thJA}	Thermal resistance junction-ambient	50		°C/W