STWH13009

High voltage fast-switching NPN power transistor

Features

- High voltage capability
- Low spread of dynamic parameters
- Very high switching speed

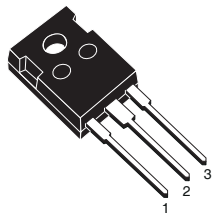
Applications

- Switching mode power supplies

Description

The device is manufactured using high voltage Multi Epitaxial Planar technology for high switching speeds anh high voltage capability.

It uses a Hollow Emitter structure to enhance switching speeds.



TO-247

Figure 1. Internal schematic diagram

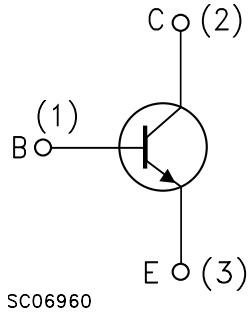


Table 1. Device summary

Order code	Marking	Package	Packaging
STWH13009	WH13009	TO-247	Tube

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-emitter voltage (V_{BE} = -1.5V)	700	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	400	V
V_{EBO}	Emitter-base voltage (I_C = 0)	12	V
I_C	Collector current	12	A
I_{CM}	Collector peak current (t_p < ms)	24	A
I_B	Base current	6	A
I_{BM}	Base peak current (t_p < ms)	12	A
P_{TOT}	Total dissipation at T_{case} = 25°C	125	W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameters	Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case max	1	°C/W

2 Electrical characteristics

(T_{case} = 25°C; unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CEV}	Collector cut-off current (V_{BE} = -1.5V)	V_{CE} = 700 V V_{CE} = 700 V T_C = 100°C			10 500	µA µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 10 V			10	µA
$V_{CEO(sus)}$(1)	Collector-emitter sustaining voltage (I_B = 0)	I_C = 10 mA	400			V
$V_{CE(sat)}$(1)	Collector-emitter saturation voltage	I_C = 4 A I_B = 0.8 A I_C = 5 A I_B = 1 A I_C = 8 A I_B = 1.6 A I_C = 12 A I_B = 2.4 A		0.2 0.25 0.35 0.6	0.5 0.6 1 2	V V V V
$V_{BE(sat)}$(1)	Base-emitter saturation voltage	I_C = 5 A I_B = 1 A I_C = 8 A I_B = 1.6 A			1.2 1.6	V V
h_{FE}(1)	DC current gain	I_C = 5 A V_{CE} =5 V I_C = 8 A V_{CE} =5 V	18 11		30 23	
t_s t_f	Inductive load Storage time Fall time	V_{CC} = 250 V I_C = 5A I_{B1}= 1 A I_{B2} = -2 A L = 200 µH		1.7 100	2.5 140	µs ns

1. Pulsed duration = 300 ms, duty cycle ≥1.5%.

2.1 Electrical characteristic (curves)

Figure 2. Safe operating area

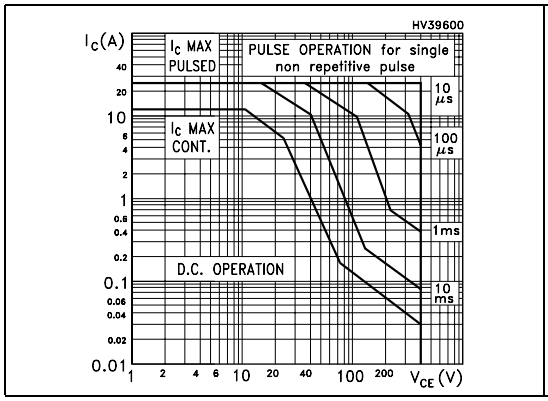


Figure 3. Derating curve

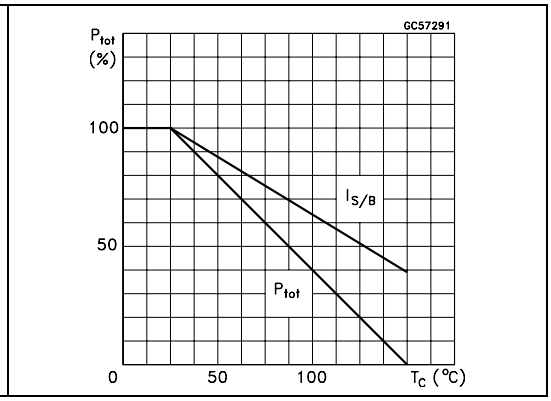


Figure 4. DC current gain

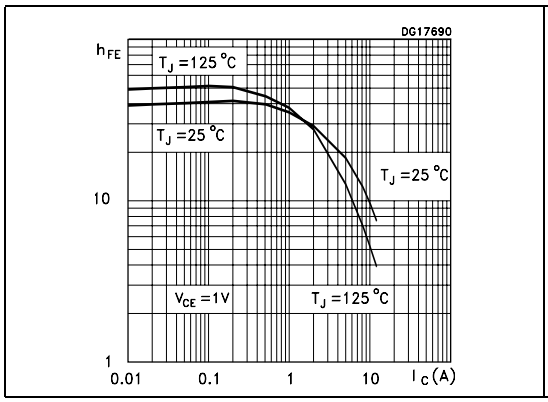


Figure 5. DC current gain

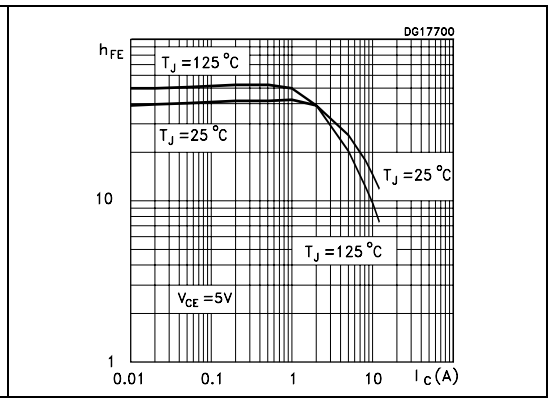


Figure 6. Collector-emitter saturation voltage

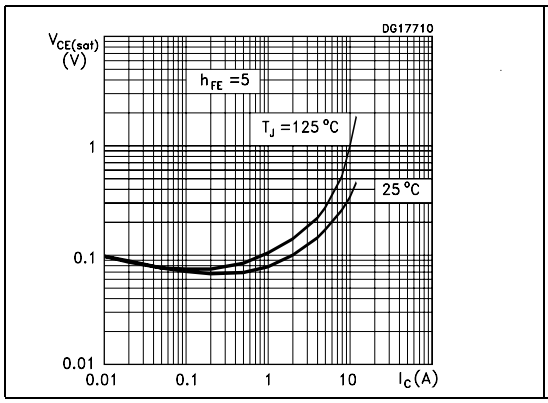


Figure 7. Base-emitter saturation voltage