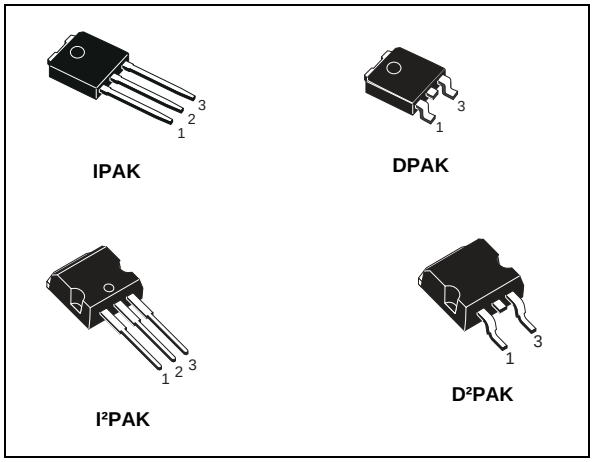
STGB18N40LZ
STGD18N40LZ

E_{AS} 180 mJ - 400 V - internally clamped IGBT

Features

- AEC Q101 compliant
- 180 mJ of avalanche energy @ T_C = 150 °C, L = 3 mH
- ESD gate-emitter protection
- Gate-collector high voltage clamping
- Logic level gate drive
- Low saturation voltage
- High pulsed current capability
- Gate and gate-emitter resistor



Application

- Pencil coil electronic ignition driver

Description

This IGBT utilizes the advanced PowerMESH™ process resulting in an excellent trade-off between switching performance and low on-state behavior.

Figure 1. Internal schematic diagram

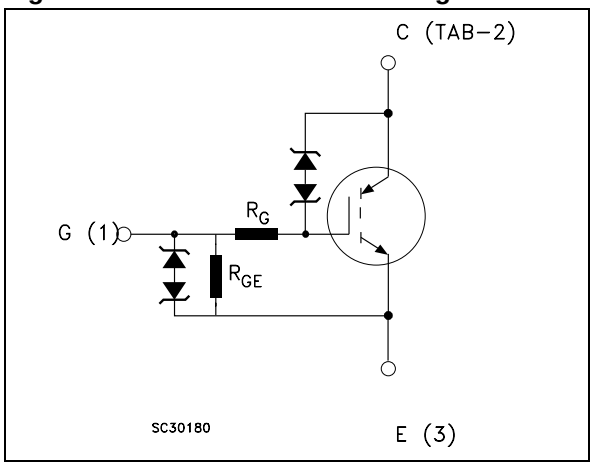


Table 1. Device summary

Order codes	Marking	Package	Packaging
STGD18N40LZT4	GD18N40LZ	DPAK	Tape and reel
STGD18N40LZ-1	GD18N40LZ	IPAK	Tube
STGB18N40LZT4	GB18N40LZ	D²PAK	Tape and reel
STGB18N40LZ-1	GB18N40LZ	I²PAK	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value		Unit
		DPAK IPAK	D²PAK I²PAK	
V_{CES}	Collector-emitter voltage (v_{GE} = 0)	$V_{CES(clamped)}$		V
V_{ECS}	Emitter collector voltage (V_{GE} = 0)	20		V
I_C (1)	Collector current (continuous) at T_C = 100 °C	25	30	A
I_{CP} (2)	Pulsed collector current	40		A
V_{GE}	Gate-emitter voltage	$V_{GE(clamped)}$		V
P_{TOT}	Total dissipation at T_C = 25 °C	125	150	W
E_{AS}	Single pulse energy T_C= 25 °C, L = 3 mH, R_G = 1 KΩ	300		mJ
E_{AS}	Single pulse energy T_C=150 °C, L = 3 mH, R_G = 1 KΩ	180		mJ
E_{SD}	Human body model, R= 1550 Ω, C = 100 pF	8		kV
	Machine model, R = 0, C = 100 pF	800		V
	Charged device model	2		kV
T_{stg}	Storage temperature	– 55 to 175		°C
T_j	Operating junction temperature			

1. Calculated according to the iterative formula:

$$I_C(T_C) = \frac{T_{JMAX} - T_C}{R_{THJ-C} \times V_{CESAT(MAX)}(T_C, I_C)}$$

2. Pulse width limited by max. junction temperature allowed

Table 3. Thermal resistance

Symbol	Parameter	Value		Unit
		DPAK IPAK	D²PAK I²PAK	
$R_{thj\text{-}case}$	Thermal resistance junction-case max	1.2	1	°C/W
$R_{thj\text{-}amb}$	Thermal resistance junction-ambient max	65	62.5	°C/W

2 Electrical characteristics

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

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{CES(clamped)}$	Collector emitter clamped voltage (V_{GE} = 0)	I_C = 2 mA, R_G = 1 kΩ T_C = - 40 °C to 150 °C	370	400	430	V
$V_{(BR)ECS}$	Emitter collector break-down voltage (V_{GE} = 0)	I_C = 75 mA	20	28		V
$V_{GE(clamped)}$	Gate emitter clamped voltage	I_G = ±2 mA	12		16	V
I_{CES}	Collector cut-off current (V_{GE} = 0)	V_{CE} = 15 V, T_C = 150 °C			10	µA
		V_{CE} = 200 V,T_C = 150 °C			100	µA
I_{GES}	Gate cut-off current (V_{CE} = 0)	V_{GE} = ±10 V	450	625	830	µA
R_{GE}	Gate emitter resistance		12	16	22	KΩ
R_G	Gate resistance			1.6		KΩ
$V_{GE(th)}$	Gate threshold voltage	V_{CE} = 12 V, I_C = 1 mA,T_C = -40 °C	1.4			V
		V_{CE} = 12 V, I_C = 1 mA	1.2	1.6	2.3	V
		V_{CE} = 12 V, I_C = 1 mA, T_C =150 °C	0.7			V
V_{GEP}	Gate emitter plateau voltage	V_{CE} = 12 V, I_C = 10 A		2.9		V
$V_{CE(sat)}$	Collector emitter saturation voltage	V_{GE} = 4.5 V, I_C = 10 A		1.35	1.7	V
		V_{GE} = 4.5 V, I_C = 10 A, T_C = 150 °C		1.30		V
		V_{GE} = 3.8 V, I_C = 6 A		1.30		V