

1. General description

Planar passivated Silicon Controlled Rectifier (SCR) in a TO263 (D2PAK) surface mountable plastic package intended for use in applications requiring good bidirectional blocking voltage and high surge current capability and high junction temperature capability ($T_{j(max)} = 150\text{ °C}$)

2. Features and benefits

- High junction operating temperature capability ($T_{j(max)} = 150\text{ °C}$)
- High bidirectional blocking voltage capability
- Very high current surge capability
- High thermal cycling performance
- Planar passivated for voltage ruggedness and reliability

3. Applications

- Capacitive Discharge Ignition (CDI)
- Crowbar protection
- Inrush protection
- Motor control
- Voltage regulation

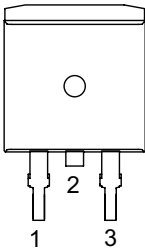

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
V_{DRM}	repetitive peak off-state voltage			600			V
$I_{T(RMS)}$	RMS on-state current	half sine wave; $T_{mb} \leq 132\text{ °C}$; Fig. 1 ; Fig. 2 ; Fig. 3		30			A
I_{TSM}	non-repetitive peak on-state current	half sine wave; $T_{j(init)} = 25\text{ °C}$; $t_p = 10\text{ ms}$; Fig. 4 ; Fig. 5		360			A
		half sine wave; $T_{j(init)} = 25\text{ °C}$; $t_p = 8.3\text{ ms}$		396			A
T_j	junction temperature			150			°C
Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
I_{GT}	gate trigger current	$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$; $T_j = 25\text{ °C}$; Fig. 7		5	-	10	mA
I_H	holding current	$V_D = 12\text{ V}$; $T_j = 25\text{ °C}$; Fig. 9		-	-	40	mA
V_T	on-state voltage	$I_T = 30\text{ A}$; $T_j = 25\text{ °C}$; Fig. 10		-	-	1.50	V
Dynamic characteristics							
dV_D/dt	rate of rise of off-state voltage	$V_{DM} = 402\text{ V}$; $T_j = 150\text{ °C}$; ($V_{DM} = 67\%$ of V_{DRM}); exponential waveform; gate open circuit		500	-	-	V/ μ s

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		 sym037
2	A	anode		
3	G	gate		
mb	A	mounting base; connected to anode		

6. Ordering information

Table 3. Ordering information

Type number	Package Name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
TYN30B-600TF	TO263	TYN30B-600TFJ	Reel	800	TO263d	17-Mar-2023

7. Marking

Table 4. Marking codes

Type number	Marking codes
TYN30B-600TF	TYN30B 600TF

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Notes	Values	Unit
V_{DRM}	repetitive peak off-state voltage			600	V
V_{RRM}	repetitive peak reverse voltage			600	V
$I_{T(AV)}$	average on-state current	half sine wave; $T_{mb} \leq 132\text{ }^{\circ}\text{C}$;		19	A
$I_{T(RMS)}$	RMS on-state current	half sine wave; $T_{mb} \leq 132\text{ }^{\circ}\text{C}$; Fig. 1 ; Fig. 2 ; Fig. 3		30	A
I_{TSM}	non-repetitive peak on-state current	half sine wave; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$; $t_p = 10\text{ ms}$; Fig. 4 ; Fig. 5		360	A
		half sine wave; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$; $t_p = 8.3\text{ ms}$		396	A
I^2t	I^2t for fusing	$t_p = 10\text{ ms}$; sine-wave pulse		648	A^2s
di_T/dt	rate of rise of on-state current	$I_G = 20\text{ mA}$		150	$\text{A}/\mu\text{s}$
I_{GM}	peak gate current			5	A
V_{GM}	peak gate voltage			5	V
V_{GRM}	peak reverse gate voltage			7	V
P_{GM}	peak gate power			20	W
$P_{G(AV)}$	average gate power	over any 20 ms period		1	W
T_{stg}	storage temperature			-40 to 150	$^{\circ}\text{C}$
T_j	junction temperature			150	$^{\circ}\text{C}$

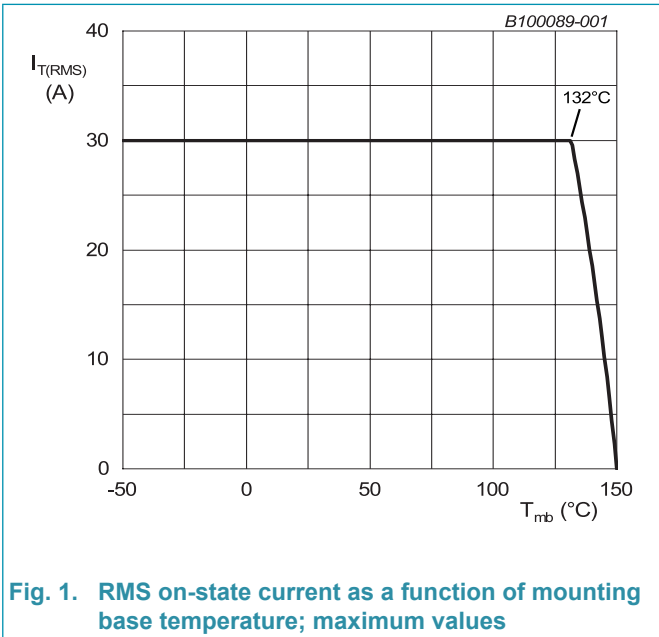


Fig. 1. RMS on-state current as a function of mounting base temperature; maximum values

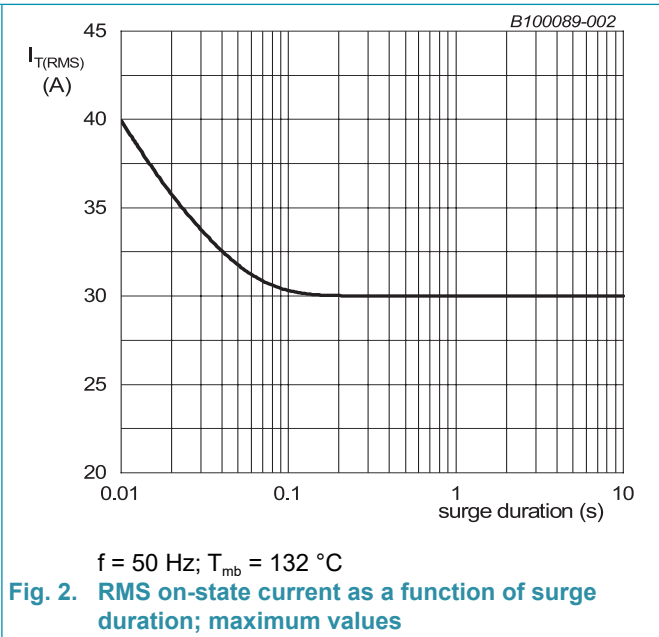
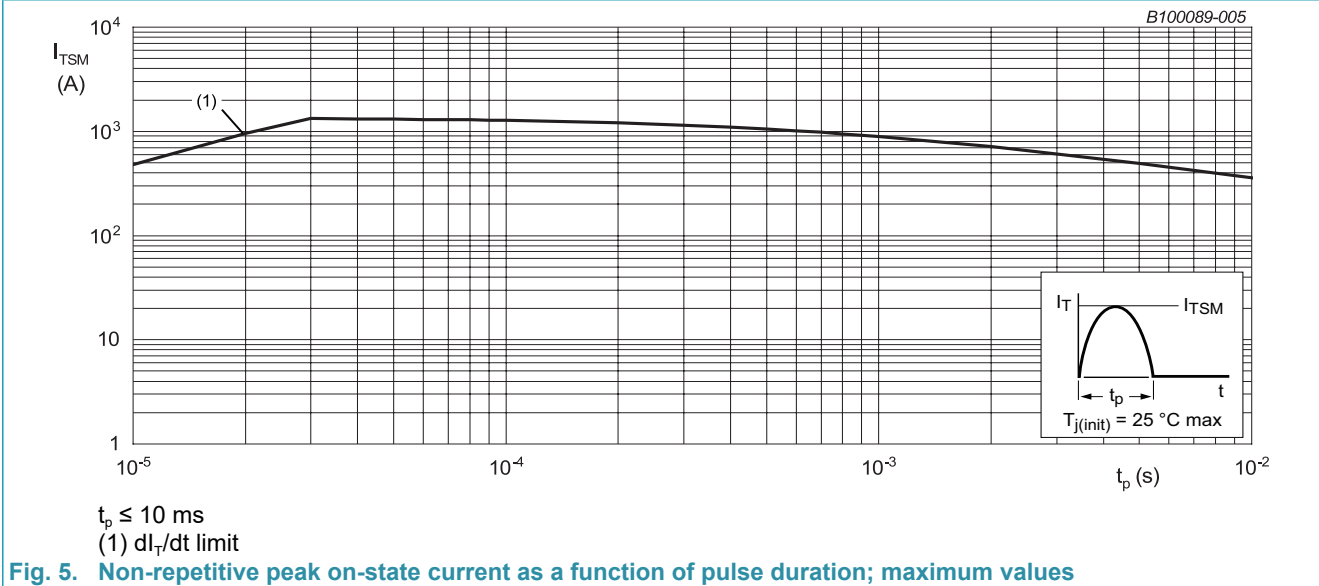
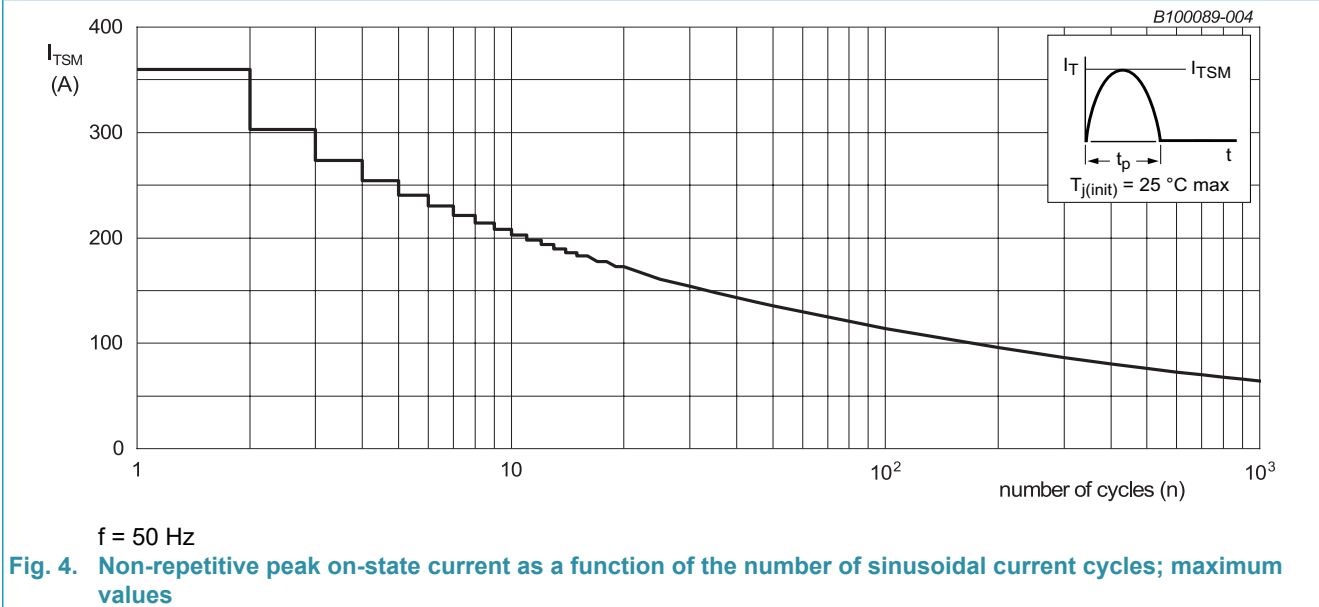
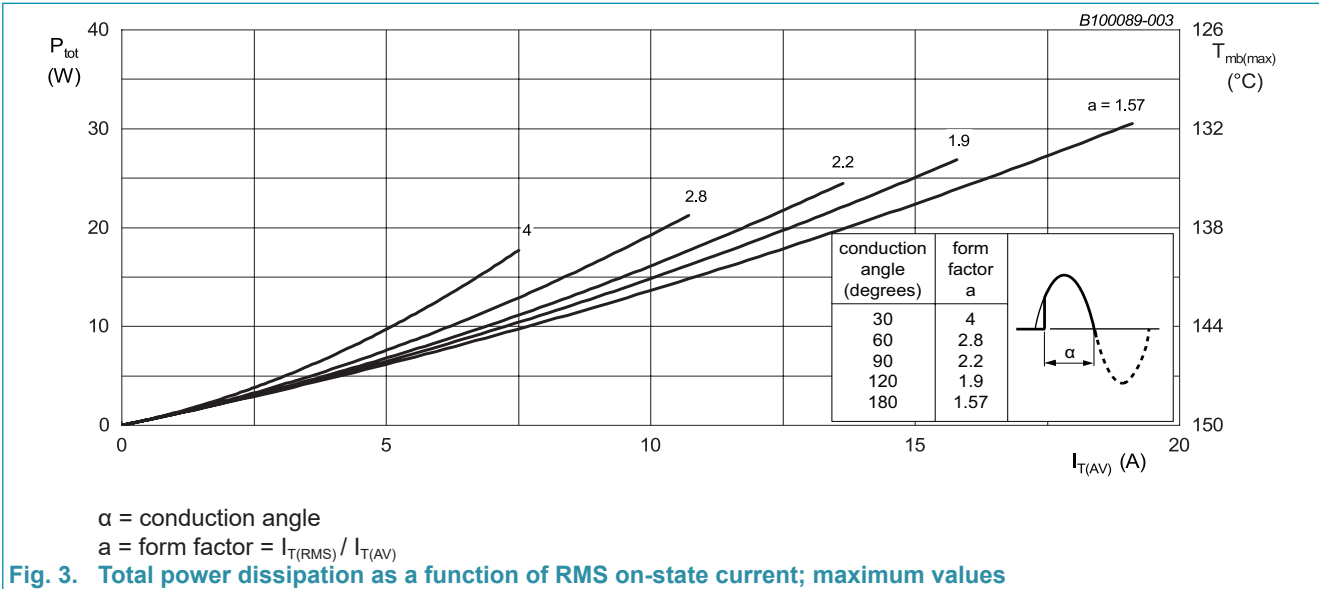


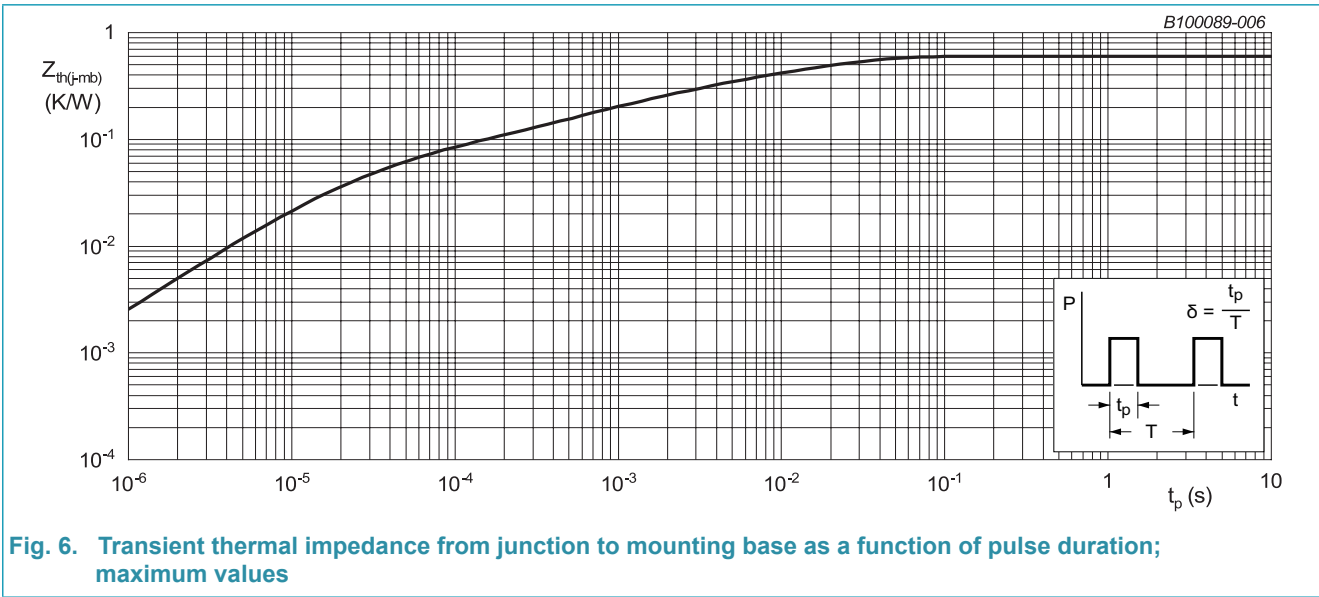
Fig. 2. RMS on-state current as a function of surge duration; maximum values



9. Thermal characteristics

Table 6. Thermal characteristics

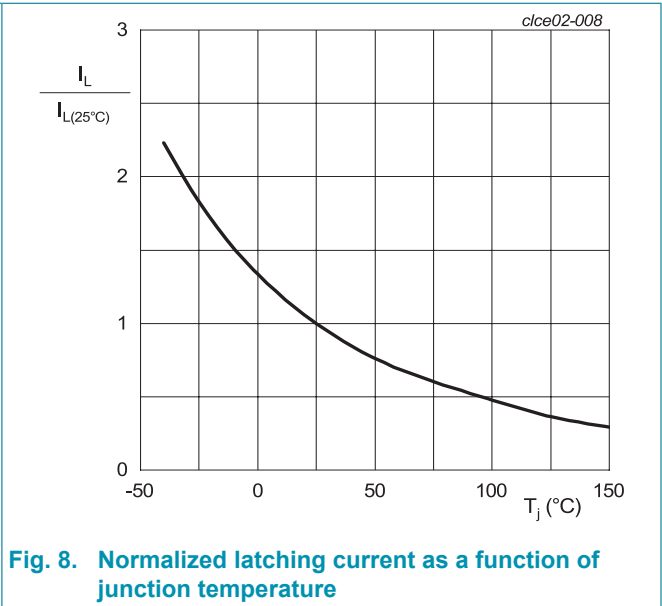
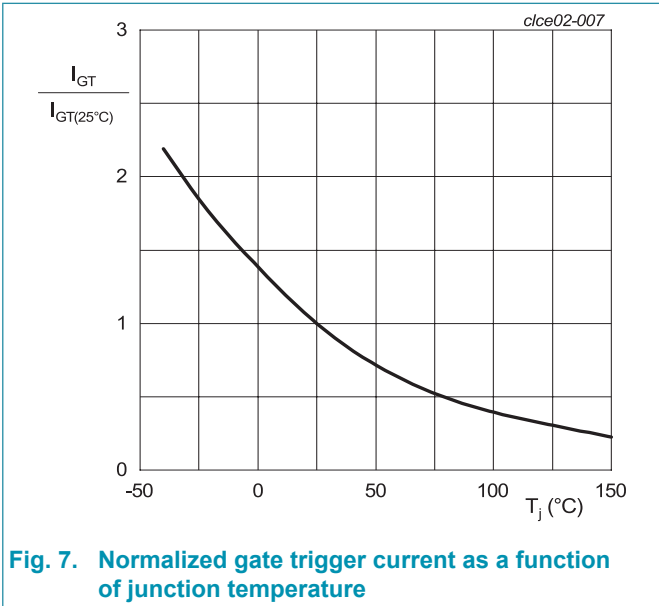
Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	Fig. 6		-	-	0.60	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air		-	60	-	K/W



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
I _{GT}	gate trigger current	V _D = 12 V; I _T = 0.1 A; T _J = 25 °C; Fig. 7		5	-	10	mA
I _L	latching current	V _D = 12 V; I _G = 0.1 A; T _J = 25 °C; Fig. 8		-	-	60	mA
I _H	holding current	V _D = 12 V; T _J = 25 °C; Fig. 9		-	-	40	mA
V _T	on-state voltage	I _T = 30 A; T _J = 25 °C; Fig. 10		-	-	1.50	V
V _{GT}	gate trigger voltage	V _D = 12 V; I _T = 0.1 A; T _J = 25 °C; Fig. 11		-	0.8	1.0	V
		V _D = 400 V; I _T = 0.1 A; T _J = 125 °C		0.25	0.45	-	V
I _D	off-state current	V _D = 600 V; T _J = 25 °C		-	-	10	μA
		V _D = 600 V; T _J = 150 °C		-	-	2	mA
I _R	reverse current	V _D = 600 V; T _J = 25 °C		-	-	10	μA
		V _D = 600 V; T _J = 150 °C		-	-	2	mA
Dynamic characteristics							
dV _D /dt	rate of rise of off-state voltage	V _{DM} = 402 V; T _J = 150 °C; (V _{DM} = 67% of V _{DRM}); exponential waveform; gate open circuit		500	-	-	V/μs
t _{gt}	gate-controlled turn-on time	I _{TM} = 30 A; V _D = 600 V; I _G = 100 mA; dI _G /dt = 5 A/μs; T _J = 25 °C		-	2	-	μs
t _q	commutated turn-off time	I _{TM} = 2 A; t _p = 50 μs; dV/dt = 5 V/μs; dI/dt = 30 A/μs; T _J = 25 °C		-	-	12	μs



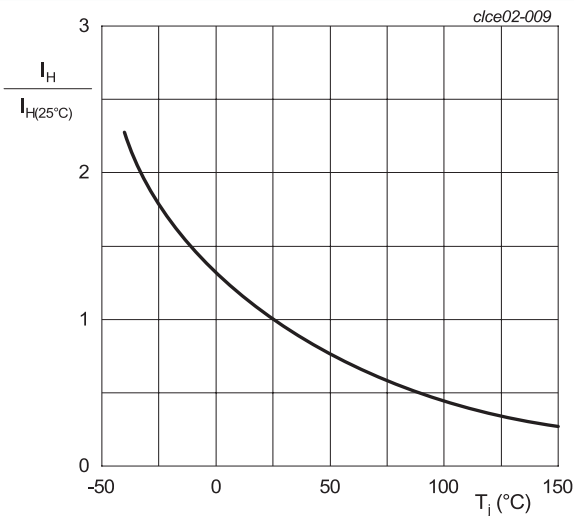
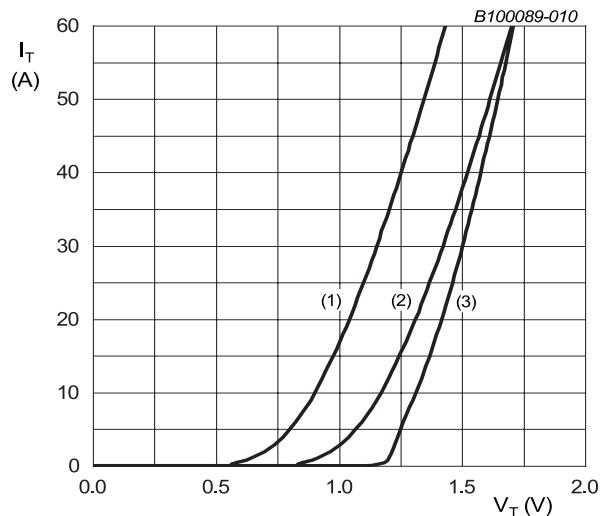


Fig. 9. Normalized holding current as a function of junction temperature



$V_o = 1.107 \text{ V}$; $R_s = 0.0104 \text{ } \Omega$
(1) $T_j = 150 \text{ } ^\circ\text{C}$; typical values
(2) $T_j = 150 \text{ } ^\circ\text{C}$; maximum values
(3) $T_j = 25 \text{ } ^\circ\text{C}$; maximum values

Fig. 10. On-state current as a function of on-state voltage

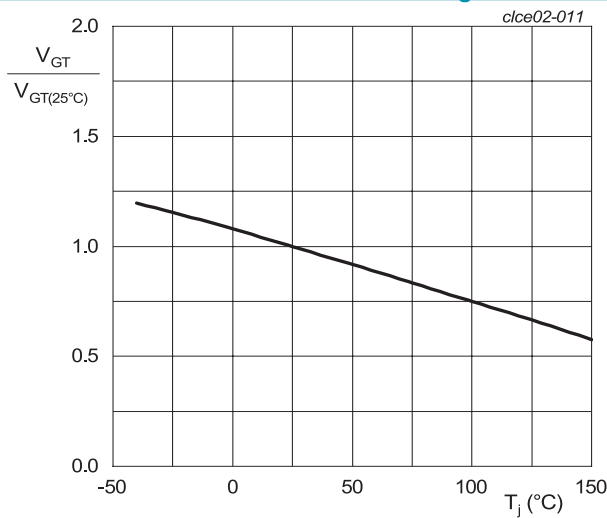


Fig. 11. Normalized gate trigger voltage as a function of junction temperature

11. Package outline

Plastic single-ended surface-mounted package (D2PAK);

TO263

The technical drawing illustrates the package outline from three perspectives: top, side, and bottom. The top view shows a rectangular body with a central circular feature and two mounting tabs at the bottom, labeled with dimensions E, D, L1, b1, (L2), b, and e. The side view shows the profile of the package with dimensions A, A1, A2, Q, H, L, c, and a gauge plane of 0.25mm. The bottom view shows the underside of the package with dimensions D1 and E1.

Note:

All dimensions do not include mold flash or protrusion.

Unit	A	A1	A2	b	b1	c	D	D1	e	E	E1	H	L	L1	L2	Q
MM	min	4.30	1.27	0.00	0.75	1.20	0.45	9.00	7.65	9.85	7.80	14.84	1.90	0.90	--	2.20
	max	4.60	1.37	0.25	0.90	1.36	0.60	9.45	8.05	10.10	8.20	15.64	2.60	1.35	1.50	2.40

12. Legal information

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Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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