

## 1. General description

Planar passivated Silicon Controlled Rectifier (SCR) in a TO263 plastic package intended for use in applications requiring very high bidirectional blocking voltage capability, high junction temperature capability and high thermal cycling performance.

## 2. Features and benefits

- High junction operating temperature capability
- High thermal cycling performance
- Planar passivated for voltage ruggedness and reliability
- Very high bidirectional blocking voltage capability

## 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			1200			V
$I_{T(AV)}$	RMS on-state current	full sine wave; $T_{mb} \leq 114\text{ °C}$ ; <a href="#">Fig. 3</a>		16			A
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{mb} \leq 114\text{ °C}$ ; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>		25			A
$I_{TSM}$	non-repetitive peak on-state current	half sine wave; $T_{j(\text{init})} = 25\text{ °C}$ ; $t_p = 10\text{ ms}$ ; <a href="#">Fig. 4</a> ; <a href="#">Fig. 5</a>		160			A
		half sine wave; $T_{j(\text{init})} = 25\text{ °C}$ ; $t_p = 8.3\text{ms}$		176			A
$T_j$	operating junction temperature			-40 to 150			°C
Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
<b>Static characteristics</b>							
$I_{GT}$	gate trigger current	$V_D = 12\text{ V}$ ; $I_T = 0.1\text{ A}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 7</a>		-	-	35	mA
$I_H$	holding current	$V_D = 12\text{ V}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 9</a>		-	-	80	mA
$V_T$	on-state voltage	$I_T = 16\text{ A}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 10</a>		-	-	1.5	V
<b>Dynamic characteristics</b>							
$dV_D/dt$	rate of rise of off-state voltage	$V_{DM} = 804\text{ V}$ ; $T_j = 150\text{ °C}$ ; ( $V_{DM} = 67\%$ of $V_{DRM}$ ); exponential waveform; gate open circuit		1000	-	-	V/ $\mu$ s

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
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
TYN16B-1200T	TO263	TYN16B-1200TJ	Reel	800	TO263N (N)	26-Sep-2016
					TO263d (d)	17-Mar-2023

## 7. Marking

Table 4. Marking codes

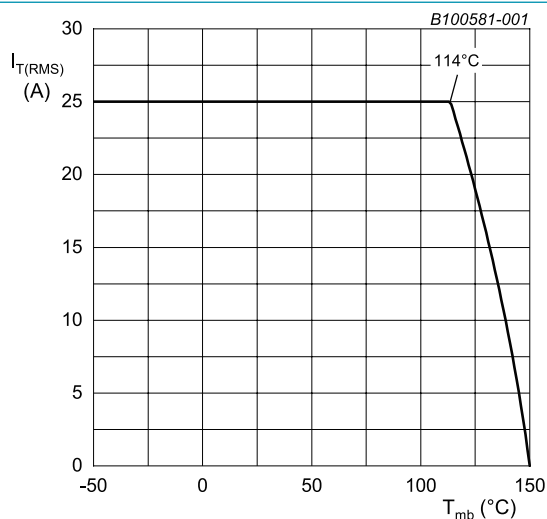
Type number	Marking codes	
	Assembly factory: N	Assembly factory: d
TYN16B-1200T	TYN16B 1200T PJNxxxx xx	TYN16B 1200T PJdxxxx xx

## 8. Limiting values

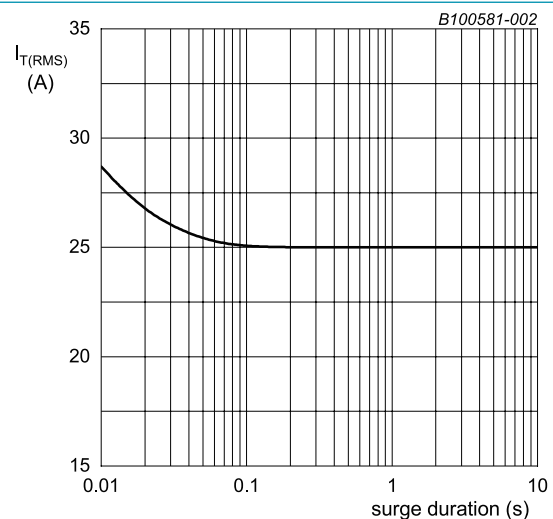
**Table 5. Limiting values**

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

Symbol	Parameter	Conditions	Notes	Values	Unit
$V_{DRM}$	repetitive peak off-state voltage			1200	V
$V_{RRM}$	repetitive peak reverse voltage			1200	V
$I_{T(AV)}$	average on-state current	half sine wave; $T_{mb} \leq 114\text{ °C}$ ; <a href="#">Fig. 3</a>		16	A
$I_{T(RMS)}$	RMS on-state current	half sine wave; $T_{mb} \leq 114\text{ °C}$ ; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a>		25	A
$I_{TSM}$	non-repetitive peak on-state current	$T_{J(init)} = 25\text{ °C}$ ; $t_p = 10\text{ ms}$ ; <a href="#">Fig. 4</a> ; <a href="#">Fig. 5</a>		160	A
		$T_{J(init)} = 25\text{ °C}$ ; $t_p = 8.3\text{ ms}$		176	A
$I^2t$	$I^2t$ for fusing	$t_p = 10\text{ ms}$ ; SIN		128	$A^2s$
$di_T/dt$	rate of rise of on-state current	$I_G = 70\text{ mA}$		100	$A/\mu s$
$I_{GM}$	peak gate current			2	A
$V_{RGM}$	peak reverse gate voltage			5	V
$P_{GM}$	peak gate power			5	W
$P_{G(AV)}$	average gate power	over any 20 ms period		0.5	W
$T_{stg}$	storage temperature			-40 to 150	$^{\circ}C$
$T_j$	operating junction temperature			-40 to 150	$^{\circ}C$



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



$f = 50\text{ Hz}$ ;  $T_{mb} = 114\text{ °C}$   
**Fig. 2. RMS on-state current as a function of surge duration; maximum values**

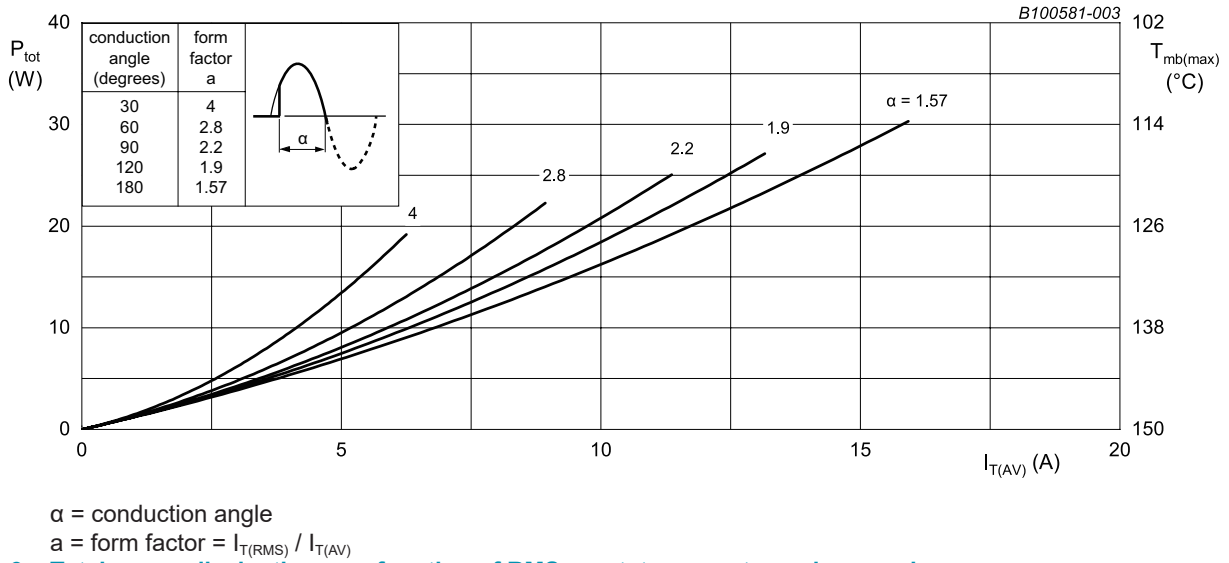


Fig. 3. Total power dissipation as a function of RMS on-state current; maximum values

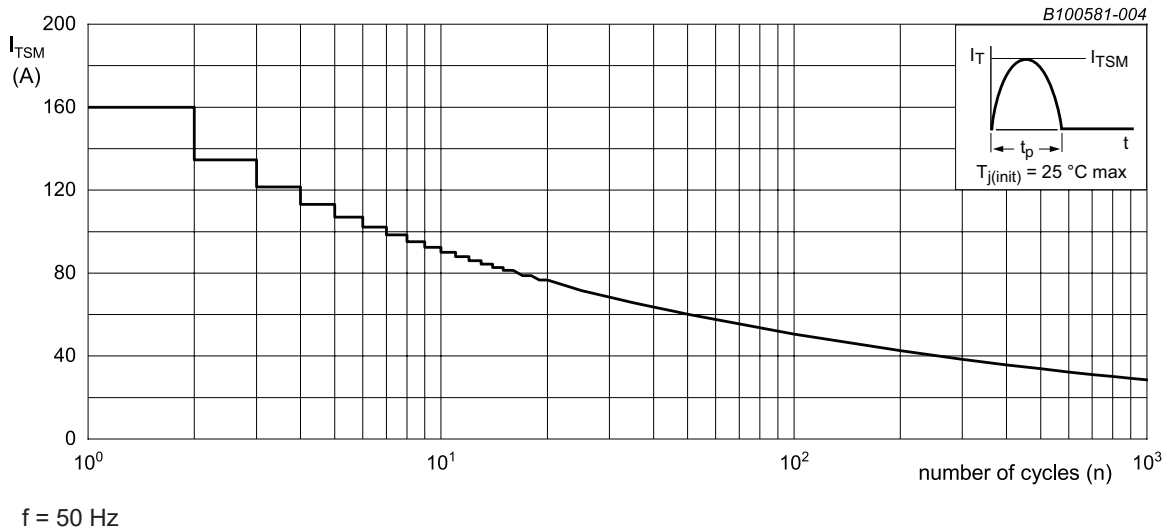


Fig. 4. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values

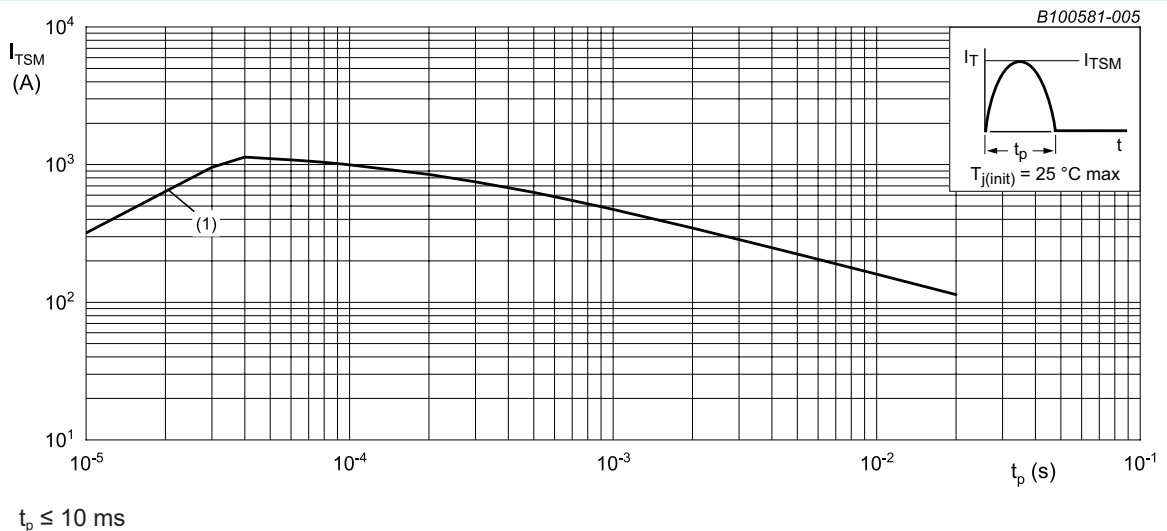


Fig. 5. Non-repetitive peak on-state current as a function of pulse width for sinusoidal currents; maximum values

## 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	full cycle; <a href="#">Fig. 6</a>		-	-	1.2	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air		-	60	-	K/W

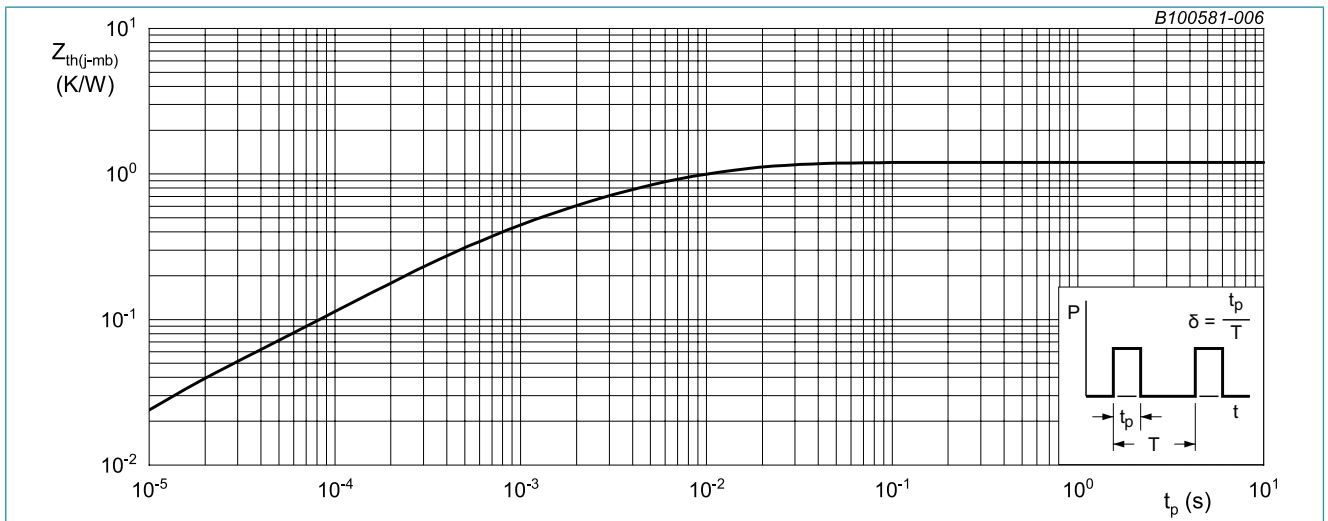


Fig. 6. Transient thermal impedance from junction to mounting base as a function of pulse width

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
<b>Static characteristics</b>							
$I_{GT}$	gate trigger current	$V_D = 12\text{ V}$ ; $I_T = 0.1\text{ A}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 7</a>		-	-	35	mA
$I_L$	latching current	$V_D = 12\text{ V}$ ; $I_G = 0.1\text{ A}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 8</a>		-	-	100	mA
$I_H$	holding current	$V_D = 12\text{ V}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 9</a>		-	-	80	mA
$V_T$	on-state voltage	$I_T = 16\text{ A}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 10</a>		-	-	1.5	V
$V_{GT}$	gate trigger voltage	$V_D = 12\text{ V}$ ; $I_T = 0.1\text{ A}$ ; $T_j = 25\text{ °C}$ ; <a href="#">Fig. 11</a>		-	-	1.0	V
		$V_D = 1200\text{ V}$ ; $I_T = 0.1\text{ A}$ ; $T_j = 125\text{ °C}$		0.25	-	-	V
$I_D$	off-state current	$V_D = 1200\text{ V}$ ; $T_j = 25\text{ °C}$		-	-	10	$\mu\text{A}$
		$V_D = 1200\text{ V}$ ; $T_j = 150\text{ °C}$		-	-	5	mA
$I_R$	reverse current	$V_R = 1200\text{ V}$ ; $T_j = 25\text{ °C}$		-	-	10	$\mu\text{A}$
		$V_R = 1200\text{ V}$ ; $T_j = 150\text{ °C}$		-	-	5	mA
<b>Dynamic characteristics</b>							
$dV_D/dt$	rate of rise of off-state voltage	$V_{DM} = 804\text{ V}$ ; $T_j = 150\text{ °C}$ ; ( $V_{DM} = 67\%$ of $V_{DRM}$ ); exponential waveform; gate open circuit		1000	-	-	V/ $\mu\text{s}$

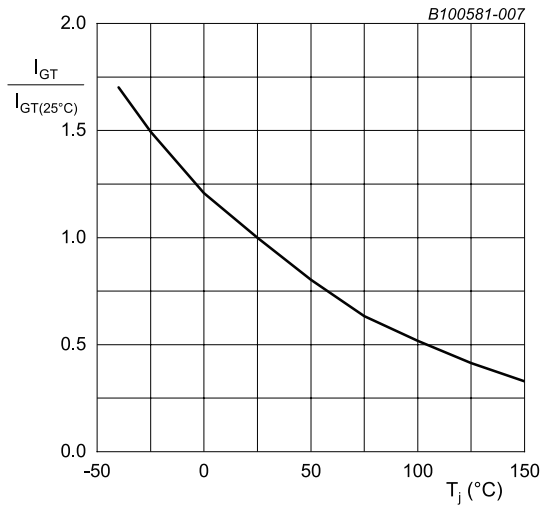


Fig. 7. Normalized gate trigger current as a function of junction temperature

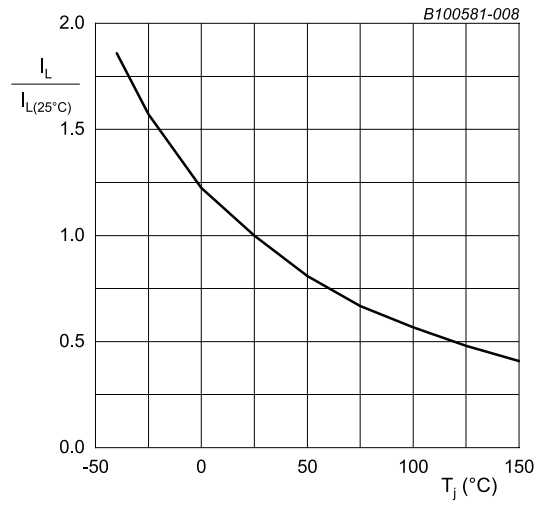


Fig. 8. Normalized latching current as a function of junction temperature

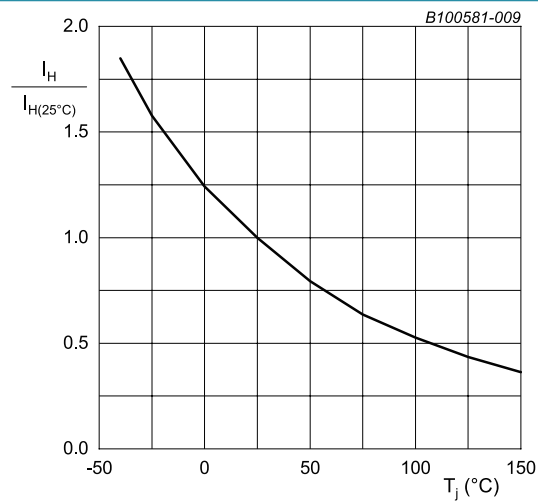
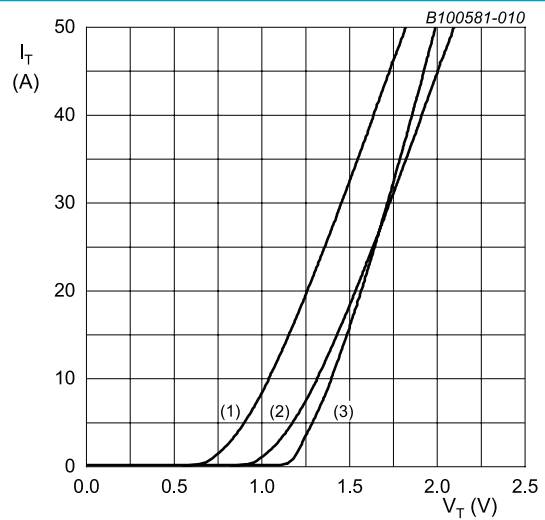


Fig. 9. Normalized holding current as a function of junction temperature



$V_o = 1.150 \text{ V}; R_s = 0.0192 \Omega$

- (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

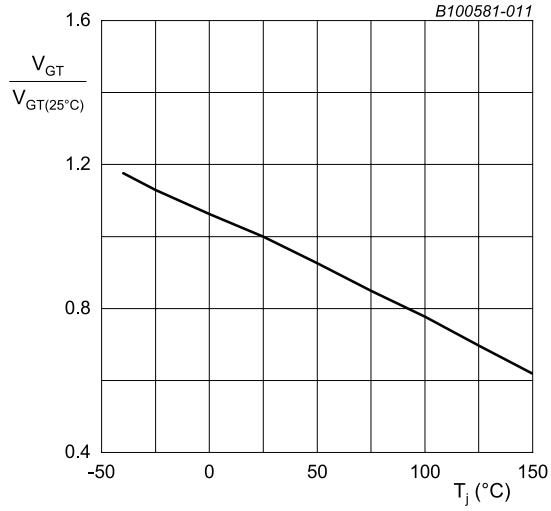
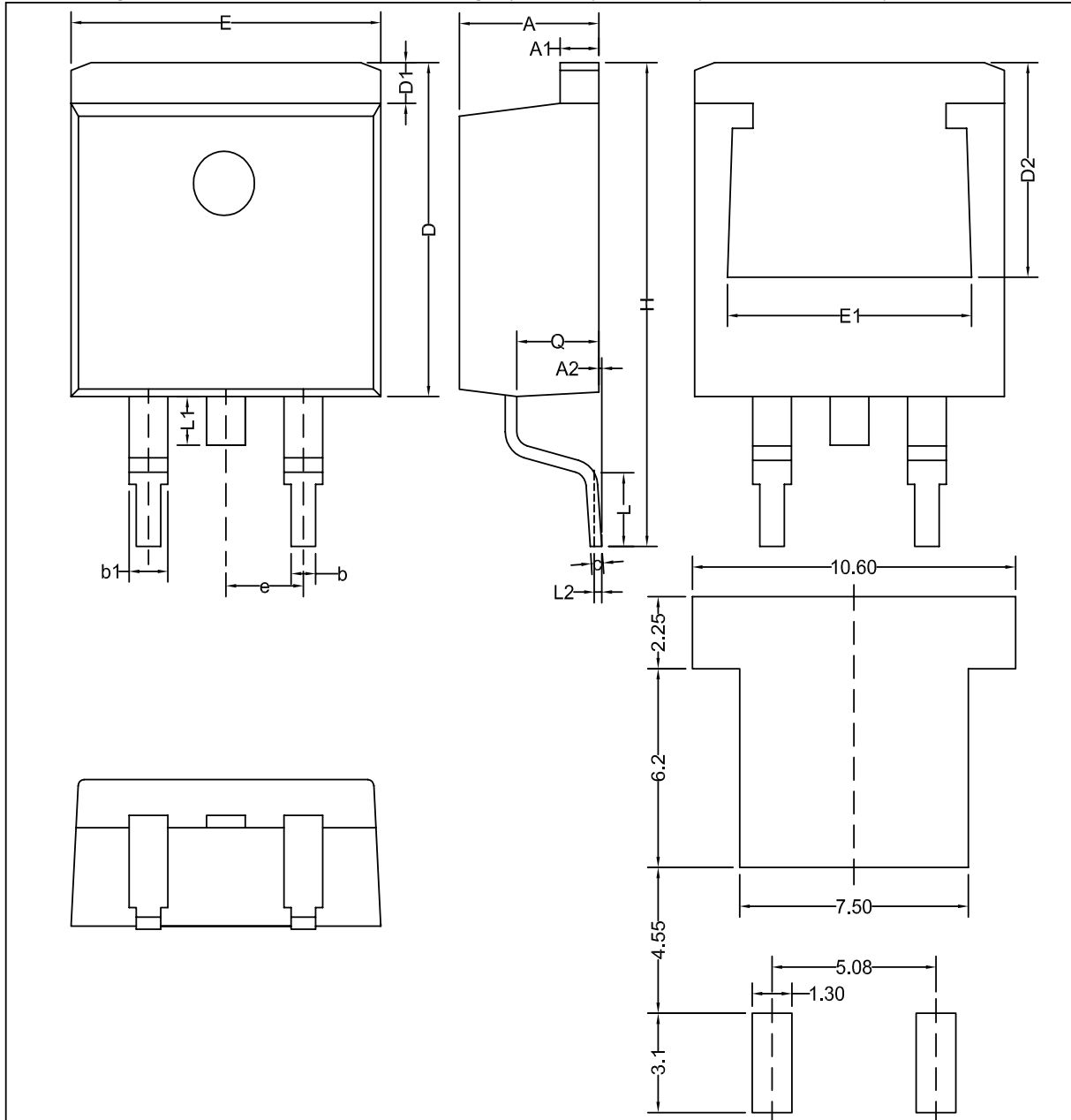


Fig. 11. Normalized gate trigger voltage as a function of junction temperature

### 11. Package outline

Assembly factory: N

Plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped) TO263



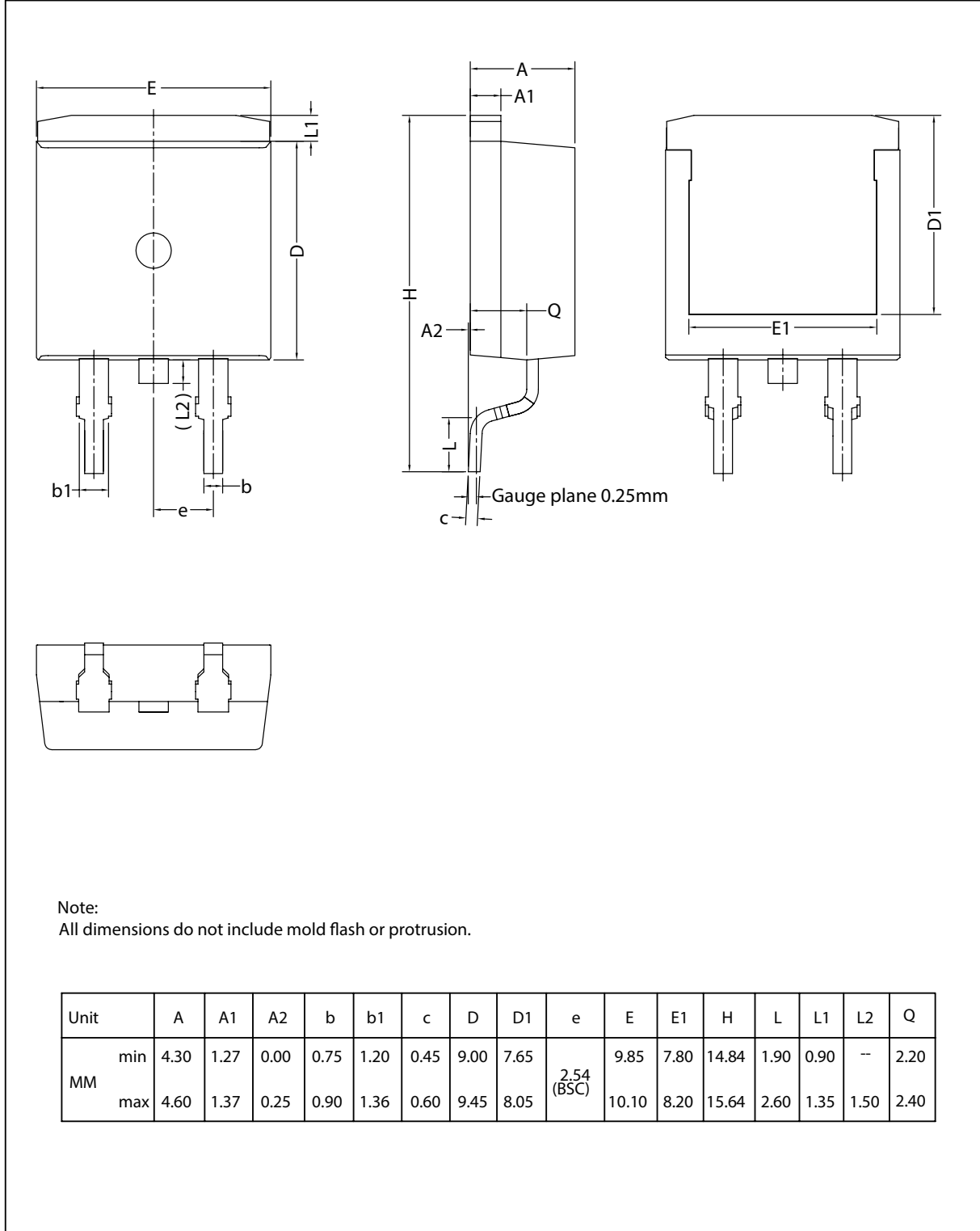
Recommended Footprint

Unit	A	A1	A2	b	b1	c	D	D1	D2	e	E	E1	H	L	L1	L2	Q
min	4.10	1.22	0.00	0.60	1.05	0.34	---	1.20	6.60	2.54 (BSC)	9.70	7.80	14.80	2.10	---	0.25 (BSC)	2.20
max	4.70	1.40	0.25	0.90	1.45	0.64	11.00	1.60	---	---	10.30	---	15.80	2.90	1.75	---	2.79

Assembly factory: d

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

TO263



## 12. Legal information

### Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
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- [2] The term 'short data sheet' is explained in section "Definitions".
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