

## 1. General description

Dual ultrafast power diode in a TO263 (D2PAK) plastic package.

## 2. Features and benefits

- Ultra low leakage current
- High junction temperature up to 175 °C
- Low on-state loss
- Fast switching
- Soft recovery characteristic minimizes power consuming oscillations
- High reverse surge capability
- High thermal cycling performance
- Low thermal resistance

## 3. Applications

- Home appliance power supply
- Secondary rectification

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values			Unit
<b>Absolute maximum rating</b>						
$V_{RRM}$	repetitive peak reverse voltage		300			V
$I_{O(AV)}$	average forward current	$\delta = 0.5$ ; square-wave pulse; $T_{mb} \leq 155$ °C; both diodes conducting; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>	20			A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25$ $\mu$ s; $T_{mb} \leq 157$ °C; square-wave pulse; per diode	20			A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10$ ms; $T_{j(initial)} = 25$ °C; sine-wave pulse; per diode; <a href="#">Fig. 4</a>	220			A
		$t_p = 8.3$ ms; $T_{j(initial)} = 25$ °C; sine-wave pulse; per diode	242			A
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 10$ A; $T_j = 25$ °C; per diode; <a href="#">Fig. 6</a>	-	-	1.25	V
		$I_F = 10$ A; $T_j = 125$ °C; per diode; <a href="#">Fig. 6</a>	-	-	1	V
<b>Dynamic characteristics</b>						
$t_{rr}$	reverse recovery time	$I_F = 1$ A; $V_R = 30$ V; $di_F/dt = 100$ A/ $\mu$ s; $T_j = 25$ °C; per diode; <a href="#">Fig. 7</a>	-	-	25	ns

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode		<p style="text-align: center;">sym125</p>
2	K	cathode		
3	A2	anode		
mb	K	mounting base; connected to cathode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
BYV32EB-300P	TO263	BYV32EB-300PJ	Reel	800	TO263E (E)	26-May-2017
					TO263P (P)	12-Jun-2023

## 7. Marking

Table 4. Marking codes

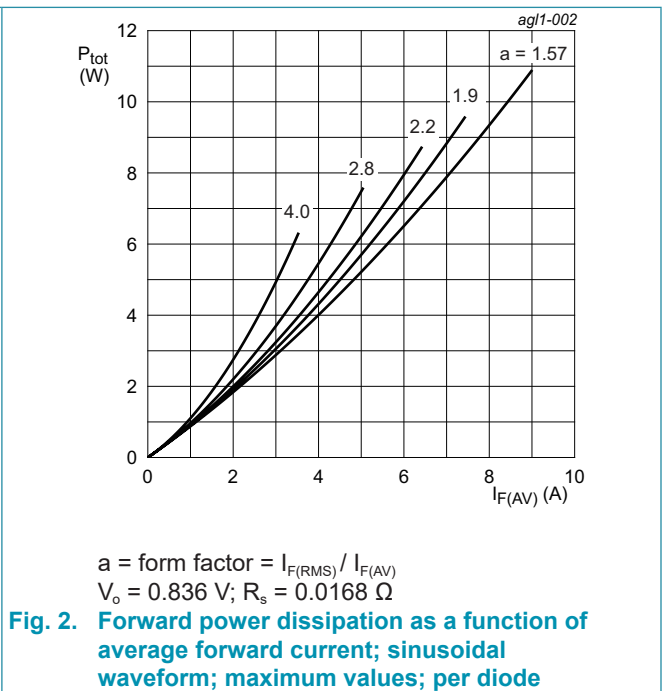
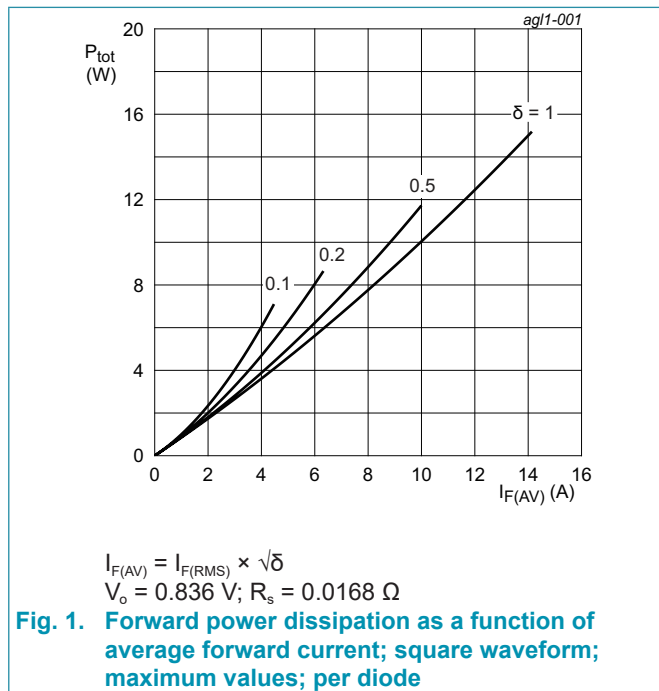
Type number	Marking codes	
	Assembly factory: E	Assembly factory: P
BYV32EB-300P	BYV32EB 300P PJExxxx xx	BYV32EB 300P PJPxxxx xx

## 8. Limiting values

**Table 5. Limiting values**

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

Symbol	Parameter	Conditions	Values	Unit
$V_{RRM}$	repetitive peak reverse voltage		300	V
$V_{RWM}$	crest working reverse voltage		300	V
$V_R$	reverse voltage	DC	300	V
$I_{O(AV)}$	average output current	$\delta = 0.5$ ; $T_{mb} \leq 155\text{ °C}$ ; square-wave pulse; both diodes conducting; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>	20	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25\ \mu\text{s}$ ; $T_{mb} \leq 157\text{ °C}$ ; square-wave pulse; per diode	20	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; sine-wave pulse; per diode; <a href="#">Fig. 4</a>	220	A
		$t_p = 8.3\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; sine-wave pulse; per diode	242	A
$T_{stg}$	storage temperature		-65 to 175	°C
$T_j$	junction temperature		175	°C



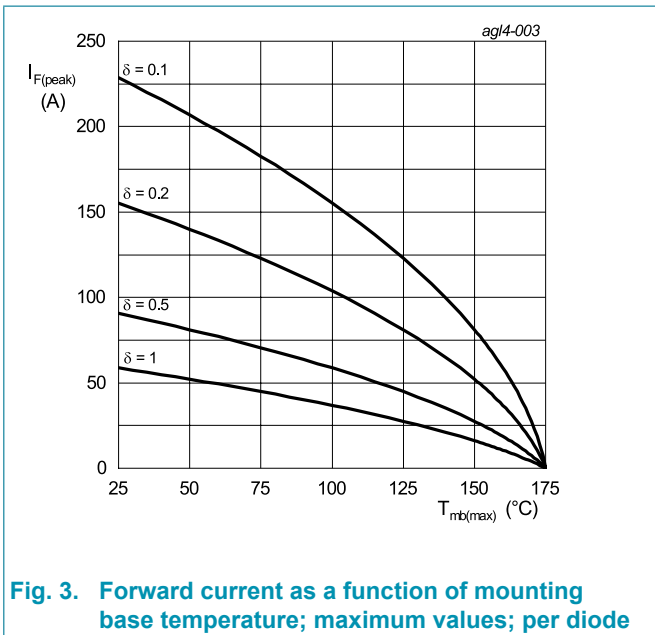


Fig. 3. Forward current as a function of mounting base temperature; maximum values; per diode

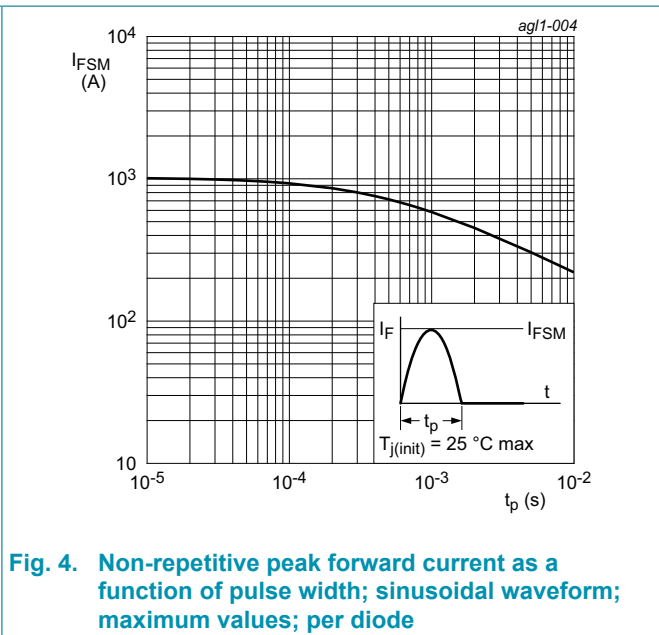


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values; per diode

### 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	with heatsink compound; per diode; <a href="#">Fig. 5</a>	-	-	1.5	K/W
		with heatsink compound; both diodes conducting; <a href="#">Fig. 5</a>	-	-	0.85	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	50	-	K/W

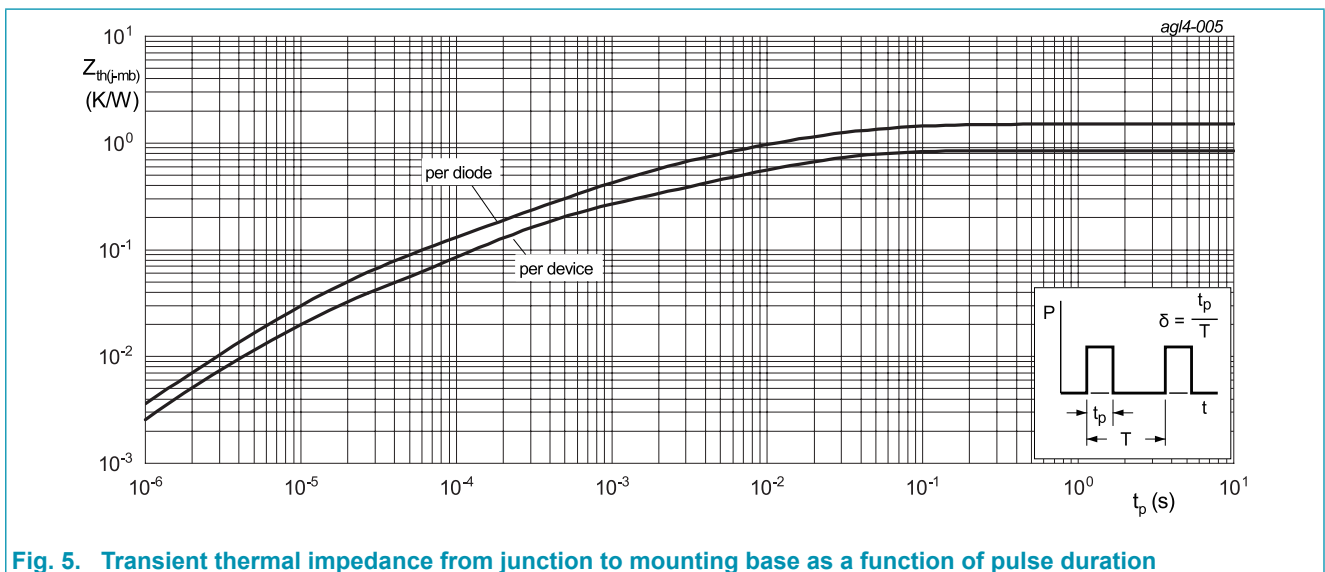
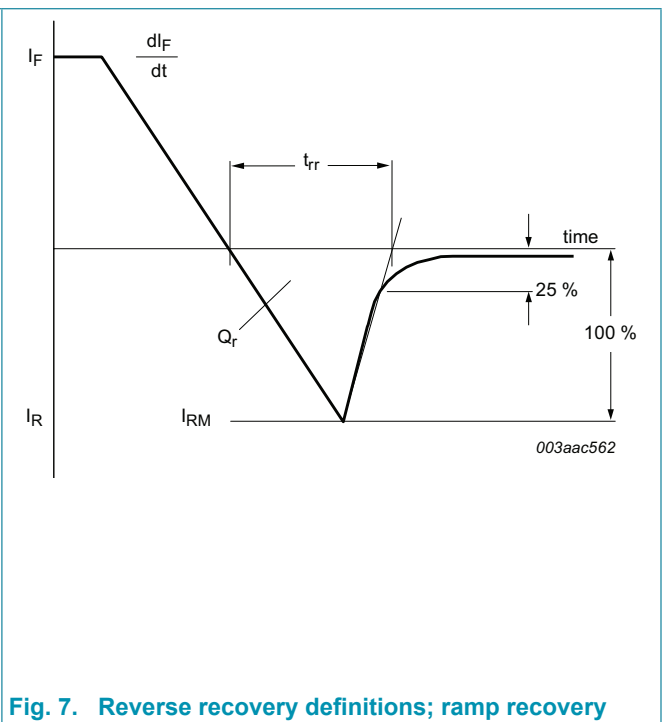
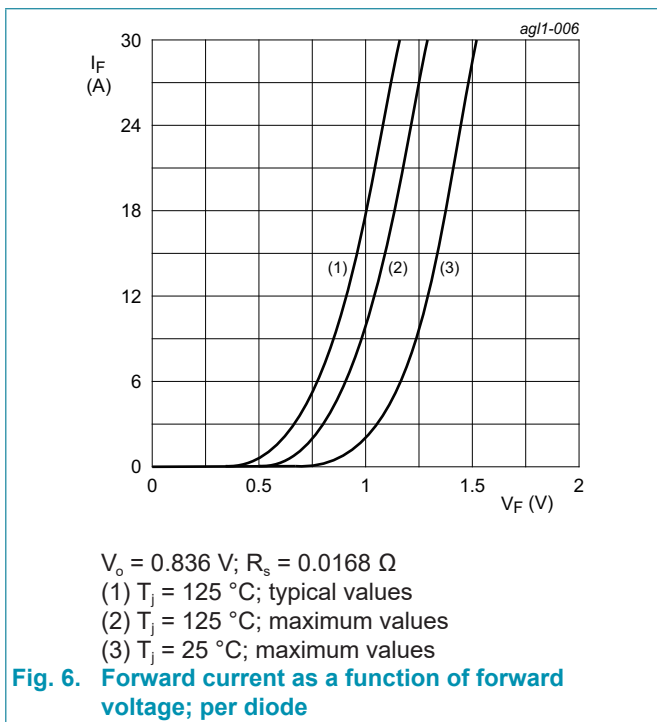


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

### 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
V <sub>F</sub>	forward current	I <sub>F</sub> = 10 A; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 6</a>	-	-	1.25	V
		I <sub>F</sub> = 10 A; T <sub>j</sub> = 125 °C; per diode; <a href="#">Fig. 6</a>	-	-	1	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 300 V; T <sub>j</sub> = 25 °C; per diode	-	-	20	µA
		V <sub>R</sub> = 300 V; T <sub>j</sub> = 125 °C; per diode	-	-	300	µA
<b>Dynamic characteristics</b>						
Q <sub>r</sub>	reverse charge	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/µs; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>	-	9	-	nC
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 50 A/µs; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>	-	-	35	ns
		I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/µs; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>	-	-	25	ns
		I <sub>F</sub> = 10 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>	-	25	-	ns
		I <sub>F</sub> = 10 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 125 °C; per diode; <a href="#">Fig. 7</a>	-	33	-	ns
I <sub>RM</sub>	peak reverse recovery current	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 50 A/µs; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>	-	0.7	-	A
		I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 100 A/µs; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>	-	1.1	-	A
		I <sub>F</sub> = 10 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 25 °C; per diode; <a href="#">Fig. 7</a>	-	2.8	-	A
		I <sub>F</sub> = 10 A; V <sub>R</sub> = 200 V; dI <sub>F</sub> /dt = 200 A/µs; T <sub>j</sub> = 125 °C; per diode; <a href="#">Fig. 7</a>	-	-	8	A

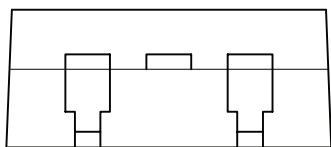
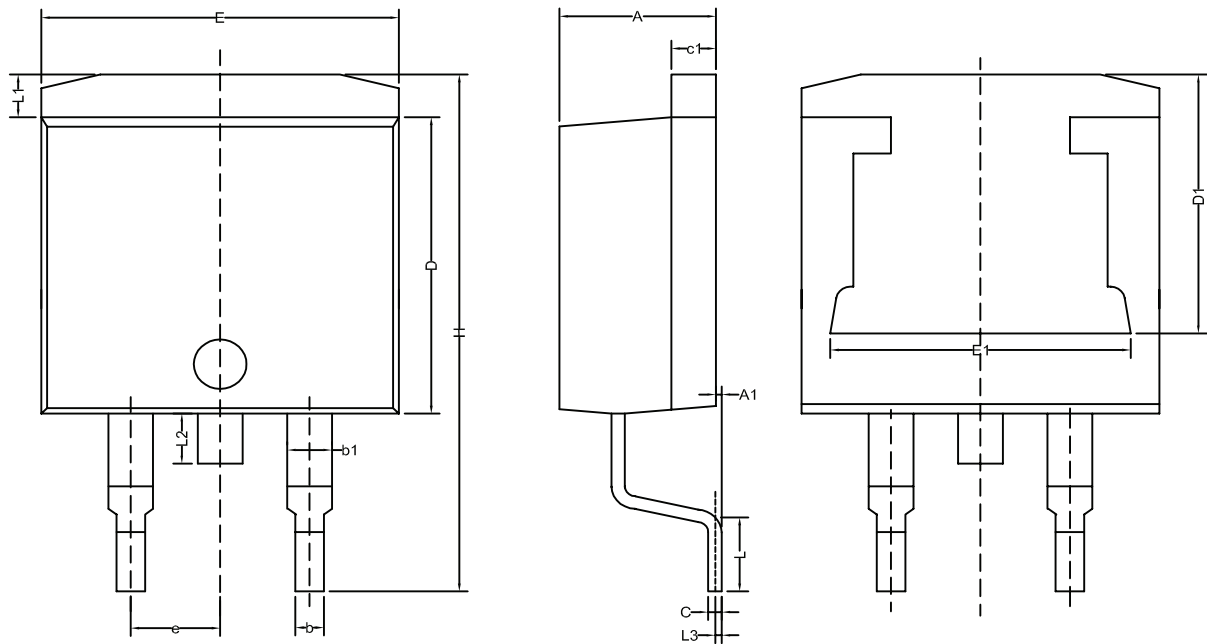


### 11. Package outline

Assembly factory: E

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

TO263

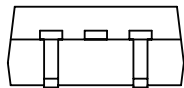
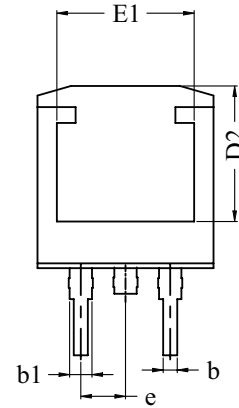
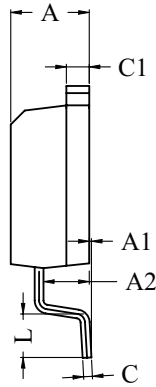
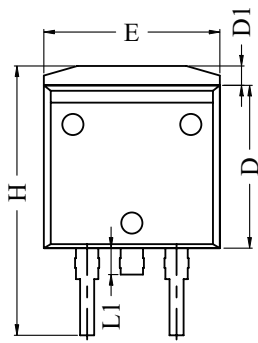


Unit	A	A1	b	b1	c	c1	D	D1	E	E1	e	H	L	L1	L2	L3
MM	min	4.35	0.00	0.69	1.14	0.38	1.14	8.50	7.50	10.00	8.25	14.60	2.50	1.00	1.27	
	max	4.75	0.15	0.99	1.73	0.61	1.40	9.02	8.00	10.40	8.80	15.60	2.79	1.65	1.78	0.25 (BSC.)

Assembly factory: P

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

TO263



Dim	All Dimensions in Millimeters		
	Min	Typ	Max
A	4.30	4.46	4.60
A1	0	0.13	0.25
A2	2.50	2.60	2.70
b	0.70	0.80	0.90
b1	1.10	1.27	1.45
C	0.40	0.52	0.60
C1	1.17	1.30	1.40
D	9.10	9.25	9.40
D1	1.00	1.10	1.30
D2	7.40	7.70	8.00
E	9.80	10.00	10.20
E1	7.60	7.80	8.00
e	2.54 BSC		
H	14.80	15.30	15.80
L	2.10	2.47	2.80
L1	1.30	1.50	1.70



## 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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## 13. Contents

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1. General description.....	1
2. Features and benefits .....	1
3. Applications .....	1
4. Quick reference data .....	1
5. Pinning information.....	2
6. Ordering information.....	2
7. Marking.....	2
8. Limiting values .....	3
9. Thermal characteristics .....	5
10. Characteristics.....	6
11. Package outline .....	7
12. Legal information .....	9
13. Contents .....	11

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