

## 1. General description

Hyperfast power diode in a 2-lead TO247 plastic package



## 2. Features and benefits

- Low leakage current
- Low thermal resistance
- Low reverse recovery current
- Reduces switching losses in associated MOSFET or IGBT

## 3. Applications

- LLC & PFC in EV charger
- MPPT in PV
- NPC-I in UPS
- Continuous Current Mode (CCM) Power Factor Correction (PFC)
- 2<sup>nd</sup> rectification in HB/FB SMPS

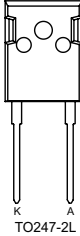
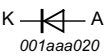
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V <sub>RRM</sub>	repetitive peak reverse voltage			600			V
I <sub>F(AV)</sub>	average forward current	δ = 0.5; T <sub>mb</sub> ≤ 92 °C; square-wave pulse; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>		100			A
I <sub>FRM</sub>	repetitive peak forward current	δ = 0.5; t <sub>p</sub> = 25 μs; T <sub>mb</sub> ≤ 92 °C; square-wave pulse		200			A
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 10 ms; T <sub>j(init)</sub> = 25 °C; sine-wave pulse; <a href="#">Fig. 4</a>		900			A
		t <sub>p</sub> = 8.3 ms; T <sub>j(init)</sub> = 25 °C; sine-wave pulse		990			A
Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 100 A; T <sub>j</sub> = 25 °C; <a href="#">Fig. 6</a>		-	1.60	2.20	V
		I <sub>F</sub> = 100 A; T <sub>j</sub> = 150 °C; <a href="#">Fig. 6</a>		-	1.20	1.80	V
Dynamic characteristics							
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>j</sub> = 25 °C; <a href="#">Fig. 7</a>		-	30	-	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		
mb	mb	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
BYC100MW-600PT2	TO247-2L	BYC100MW-600PT2Q	Tube	30	TO247L-2L (L)	10-Nov-2020
					TO247P-2L (P)	31-Mar-2023

7. Marking

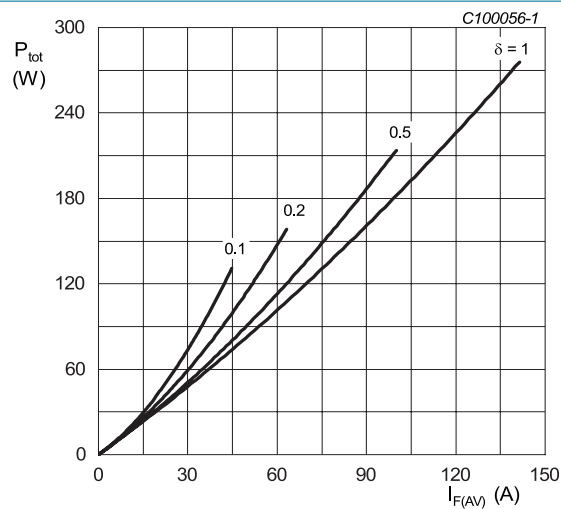
Table 4. Marking codes

Type number	Marking codes	
	Assembly factory: L	Assembly factory: P
BYC100MW-600PT2	BYC100MW 600PT2 PJLxxxx xx	BYC100MW 600PT2 PJPxxxx xx

8. Limiting values

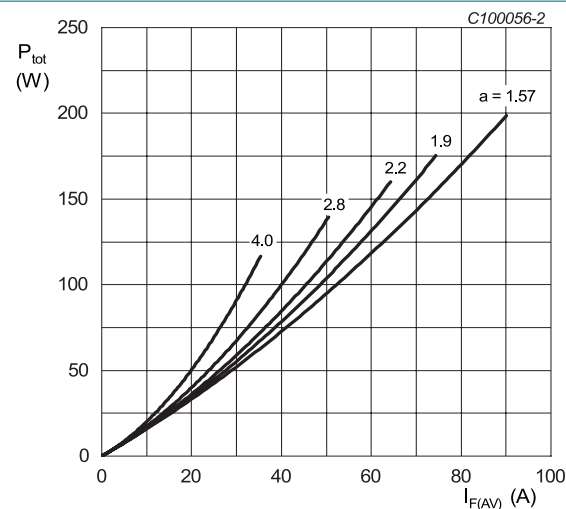
Table 5. Limiting values  
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Notes	Values	Unit
$V_{RRM}$	repetitive peak reverse voltage			600	V
$V_{RWM}$	crest working reverse voltage			600	V
$V_R$	reverse voltage	DC		600	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; $T_{mb} \leq 92\text{ }^{\circ}\text{C}$ ; square-wave pulse; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>		100	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25\text{ }\mu\text{s}$ ; $T_{mb} \leq 92\text{ }^{\circ}\text{C}$ ; square-wave pulse		200	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ }^{\circ}\text{C}$ ; sine-wave pulse; <a href="#">Fig. 4</a>		900	A
		$t_p = 8.3\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ }^{\circ}\text{C}$ ; sine-wave pulse		990	A
$I^2t$	$I^2t$ for fusing	$t_p = 10\text{ ms}$ ; sine-wave pulse		2450	$\text{A}^2\text{s}$
$T_{stg}$	storage temperature			-65 to 175	$^{\circ}\text{C}$
$T_j$	junction temperature			-65 to 175	$^{\circ}\text{C}$



$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$   
 $V_o = 1.500\text{ V}$ ;  $R_s = 0.0032\text{ }\Omega$

Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values



$a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$   
 $V_o = 1.500\text{ V}$ ;  $R_s = 0.0032\text{ }\Omega$

Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

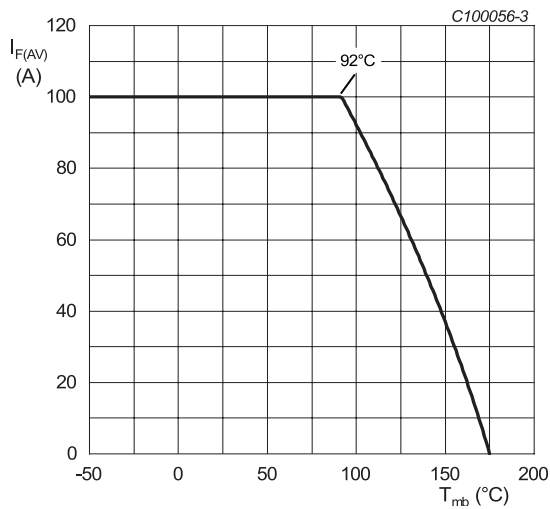


Fig. 3. Average forward current as a function of mounting base temperature; maximum values

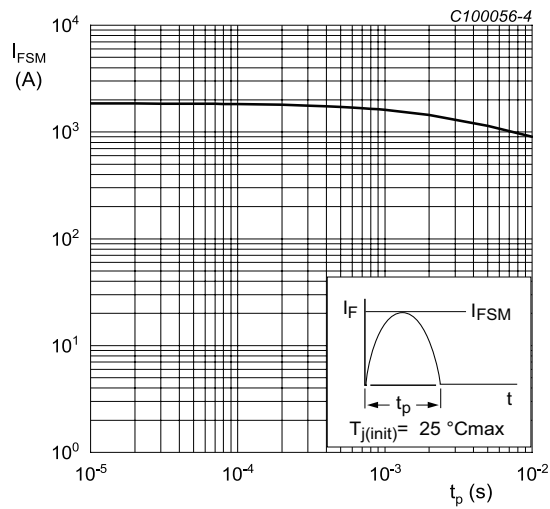


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

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	<a href="#">Fig. 5</a>		-	-	0.39	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	45	-	K/W

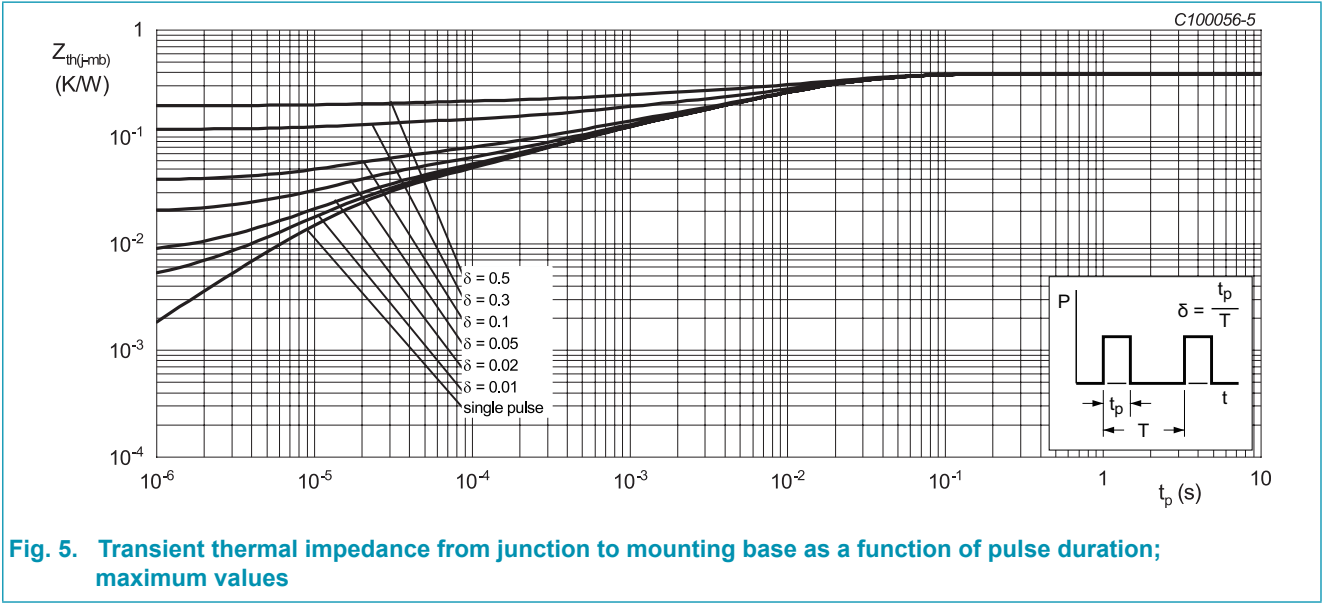
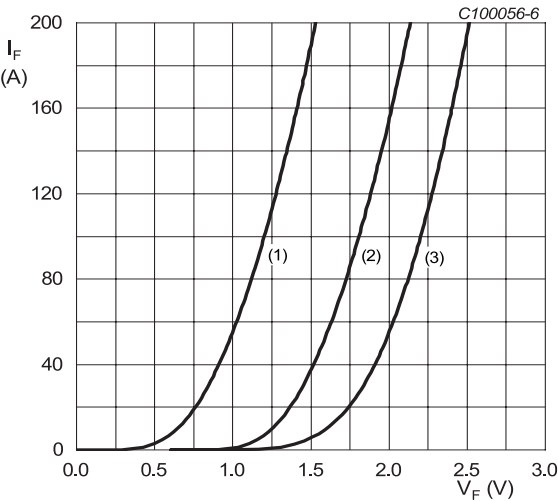


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration; maximum values

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 100 A; T <sub>J</sub> = 25 °C; <a href="#">Fig. 6</a>		-	1.60	2.20	V
		I <sub>F</sub> = 100 A; T <sub>J</sub> = 150 °C; <a href="#">Fig. 6</a>		-	1.20	1.80	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 600 V; T <sub>J</sub> = 25 °C		-	3	200	μA
		V <sub>R</sub> = 600 V; T <sub>J</sub> = 150 °C		-	0.4	5	mA
Dynamic characteristics							
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 1 A; V <sub>R</sub> = 30 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>J</sub> = 25 °C; <a href="#">Fig. 7</a>		-	30	-	ns
		I <sub>F</sub> = 50 A; V <sub>R</sub> = 400 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>J</sub> = 25 °C; <a href="#">Fig. 7</a>		-	55	-	ns
		I <sub>F</sub> = 50 A; V <sub>R</sub> = 400 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>J</sub> = 125 °C; <a href="#">Fig. 7</a>		-	100	-	ns
I <sub>RM</sub>	peak reverse recovery current	I <sub>F</sub> = 50 A; V <sub>R</sub> = 400 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>J</sub> = 25 °C; <a href="#">Fig. 7</a>		-	5	-	A
		I <sub>F</sub> = 50 A; V <sub>R</sub> = 400 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>J</sub> = 125 °C; <a href="#">Fig. 7</a>		-	15	-	A
Q <sub>r</sub>	recovered charge	I <sub>F</sub> = 50 A; V <sub>R</sub> = 400 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>J</sub> = 25 °C; <a href="#">Fig. 7</a>		-	145	-	nC
		I <sub>F</sub> = 50 A; V <sub>R</sub> = 400 V; dI <sub>F</sub> /dt = 200 A/μs; T <sub>J</sub> = 125 °C; <a href="#">Fig. 7</a>		-	735	-	nC
E <sub>as</sub>	non-repetitive avalanche energy	T <sub>J</sub> = 25 °C		90	-	-	mJ



- (1) T<sub>J</sub> = 150 °C; typical values
  - (2) T<sub>J</sub> = 150 °C; maximum values
  - (3) T<sub>J</sub> = 25 °C; maximum values
- V<sub>0</sub> = 1.500 V; R<sub>s</sub> = 0.0032 Ω

Fig. 6. Forward current as a function of forward voltage

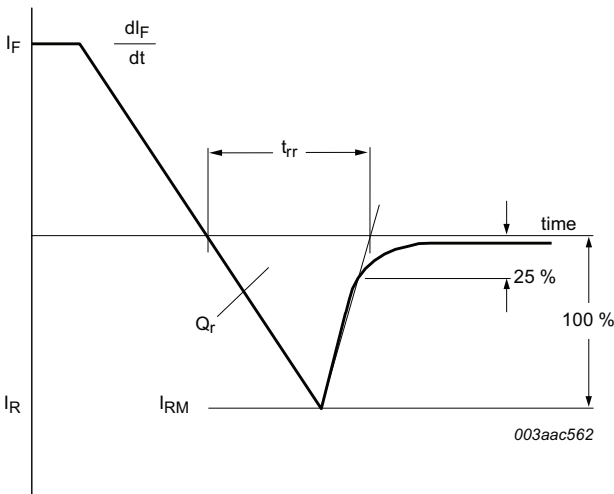


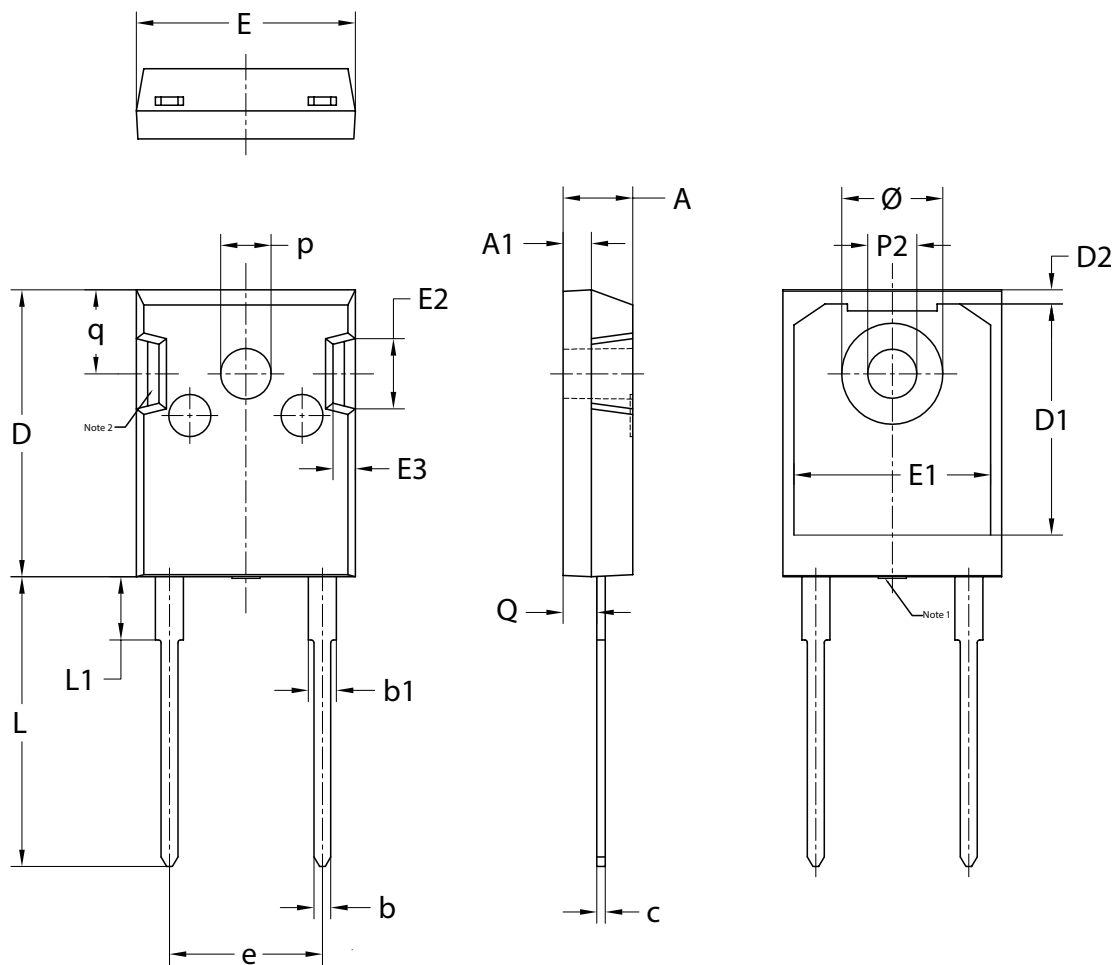
Fig. 7. Reverse recovery definitions; ramp recovery

11. Package outline

Assembly factory: L

Plastic single-ended through-hole package; heatsink mounted; 1 mounting hole; 2 leads TO-247

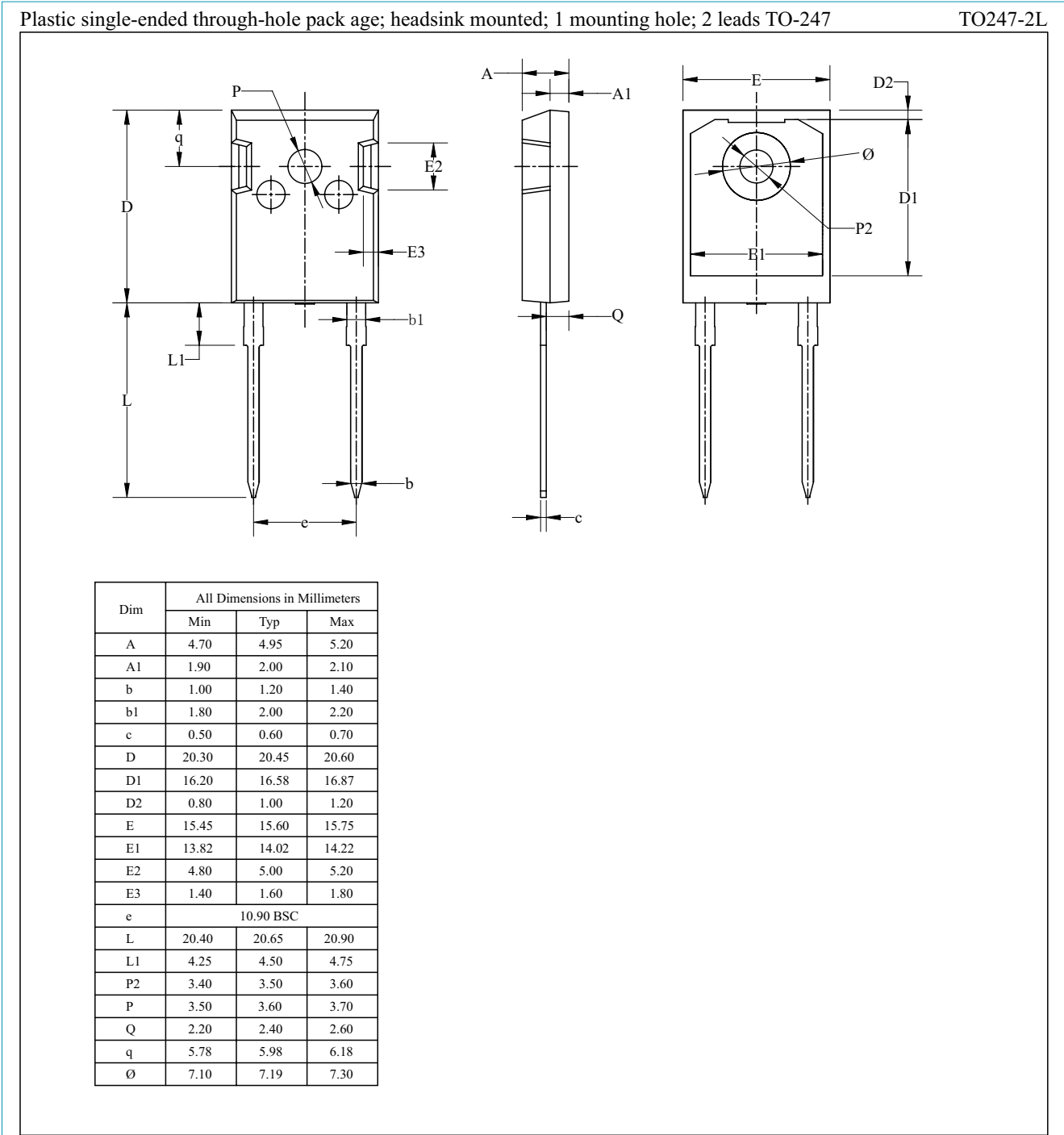
TO247-2L



UNIT	A	A <sub>1</sub>	b	b <sub>1</sub>	c	D	D <sub>1</sub>	D <sub>2</sub>	E	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	e	L	L <sub>1</sub>	P <sub>2</sub>	p	Q	q	Ø
mm	5.20	2.10	1.40	2.20	0.70	20.60	16.20	1.20	15.75	14.22	5.20	1.80	10.90	20.72	4.75	3.60	3.70	2.60	6.18	7.30
	4.70	1.90	1.00	1.80	0.50	20.30	16.87	0.80	15.45	13.82	4.80	1.40	BSC	20.22	4.25	3.40	3.50	2.20	5.78	7.10

Note:  
1. Mold resin protrusion max 0.127mm.  
2. Metal exposed with Sn plating.

Assembly factory: P





## 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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