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1 Maximum ratings

Table 3 Maximum ratings

Parameter	Symbol	Values			Unit	Note/Test condition
		Min.	Typ.	Max.		
Continuous forward current	I_F	–	–	10	A	$T_C \leq 140\text{ °C}, D = 1$
		–	–	13		$T_C \leq 125\text{ °C}, D = 1$
		–	–	24		$T_C \leq 25\text{ °C}, D = 1$
Surge-repetitive forward current, sine halfwave ¹	$I_{F, RM}$	–	–	44		$T_C = 25\text{ °C}, t_p = 10\text{ ms}$
Surge non-repetitive forward current, sine halfwave	$I_{F, SM}$	–	–	55		$T_C = 25\text{ °C}, t_p = 10\text{ ms}$
		–	–	44		$T_C = 150\text{ °C}, t_p = 10\text{ ms}$
Non-repetitive peak forward current	$I_{F, max}$	–	–	600		$T_C = 25\text{ °C}, t_p = 10\text{ }\mu\text{s}$
i ² t value	$\int i^2 dt$	–	–	15	A ² s	$T_C = 25\text{ °C}, t_p = 10\text{ ms}$
		–	–	10		$T_C = 150\text{ °C}, t_p = 10\text{ ms}$
Repetitive peak reverse voltage	V_{RRM}	–	–	650	V	$T_C = 25\text{ °C}$
Diode dv/dt ruggedness	dv/dt	–	–	150	V/ns	$V_R = 0..480\text{ V}$
Power dissipation	P_{tot}	–	–	72	W	$T_C = 25\text{ °C}, R_{thJC, max}$
Operating and storage temperature	T_j	-55	–	175	°C	–
	T_{stg}					
Mounting torque	–	–	–	70	Ncm	M3 screw

2 Thermal characteristics

Table 4 Thermal characteristics (PG-TO-220-2)

Parameter	Symbol	Values			Unit	Note/Test condition
		Min.	Typ.	Max.		
Thermal resistance, junction-case	R_{thJC}	–	1.3	2.1	K/W	–
Thermal resistance, junction-ambient	R_{thJA}	–	–	62		lead
Soldering temperature, wavesoldering only allowed at leads	T_{sld}	–	–	260	°C	1.6 mm (0.063 in.) from case for 10 s

¹ The surge-repetitive forward current test was performed with 1000 pulses (half-wave rectified sine with the 10 ms period).

3 Electrical characteristics

3.1 Static characteristics

Table 5 Static characteristics

Parameter	Symbol	Values			Unit	Note/Test condition
		Min.	Typ.	Max.		
DC blocking voltage	V_{DC}	650	–	–	V	$T_j = 25\text{ °C}$
Diode forward voltage	V_F	–	1.25	1.35		$I_F = 10\text{ A}, T_j = 25\text{ °C}$
		–	1.5	–		$I_F = 10\text{ A}, T_j = 150\text{ °C}$
Reverse current	I_R	–	1.0	33	μA	$V_R = 420\text{ V}, T_j = 25\text{ °C}$
		–	33	–		$V_R = 420\text{ V}, T_j = 125\text{ °C}$
		–	77	–		$V_R = 420\text{ V}, T_j = 150\text{ °C}$

3.2 AC characteristics

Table 6 AC characteristics

Parameter	Symbol	Values			Unit	Note/Test Condition
		Min.	Typ.	Max.		
Total capacitive charge	Q_c	–	14.7	–	nC	$V_R = 400\text{ V}, T_j = 150\text{ °C},$ $di/dt = 200\text{ A}/\mu\text{s}, I_F \leq I_{F,MAX}$
Total capacitance	C	–	495	–	pF	$V_R = 1\text{ V}, f = 1\text{ MHz},$ $T_j = 25\text{ °C}$
		–	29	–		$V_R = 300\text{ V}, f = 1\text{ MHz},$ $T_j = 25\text{ °C}$
		–	28	–		$V_R = 600\text{ V}, f = 1\text{ MHz},$ $T_j = 25\text{ °C}$

4 Diagrams

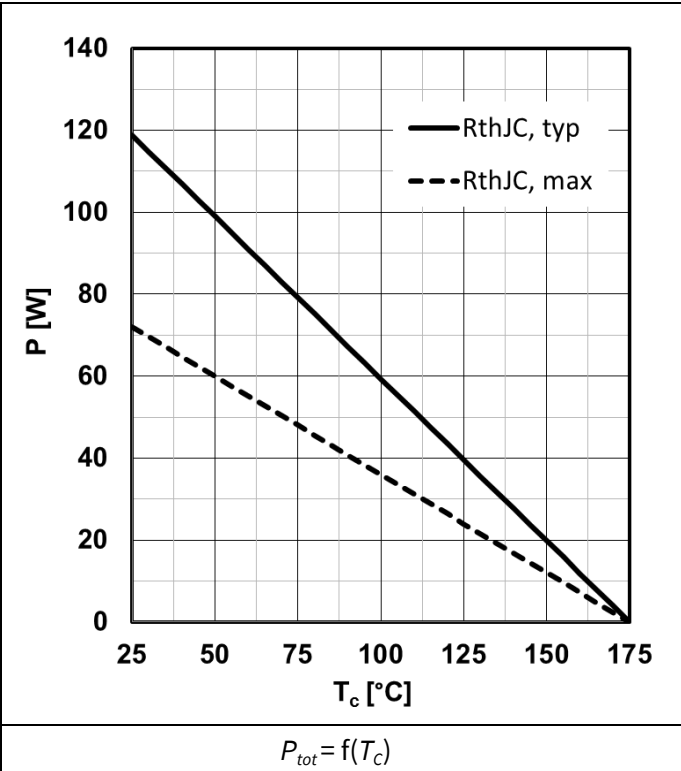


Figure 1 Power dissipation

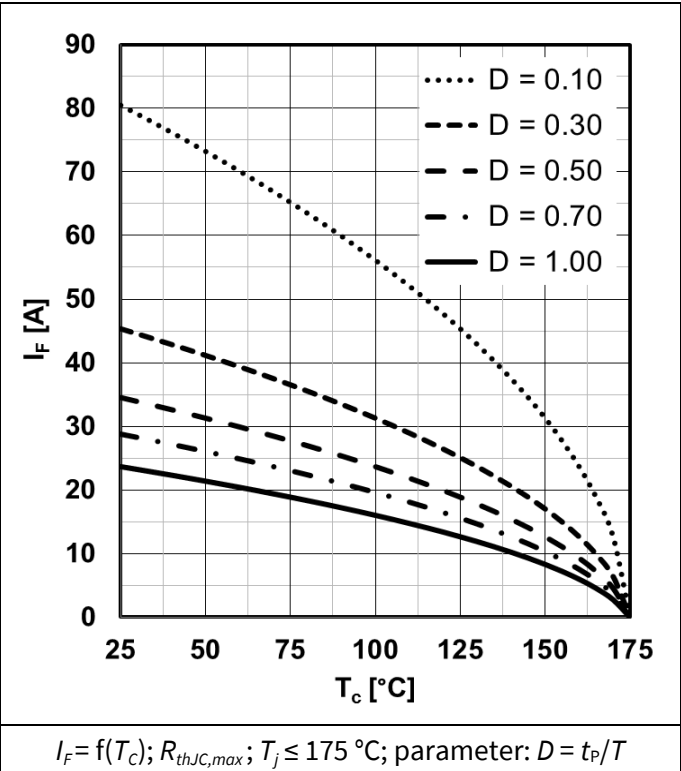


Figure 2 Max. forward current

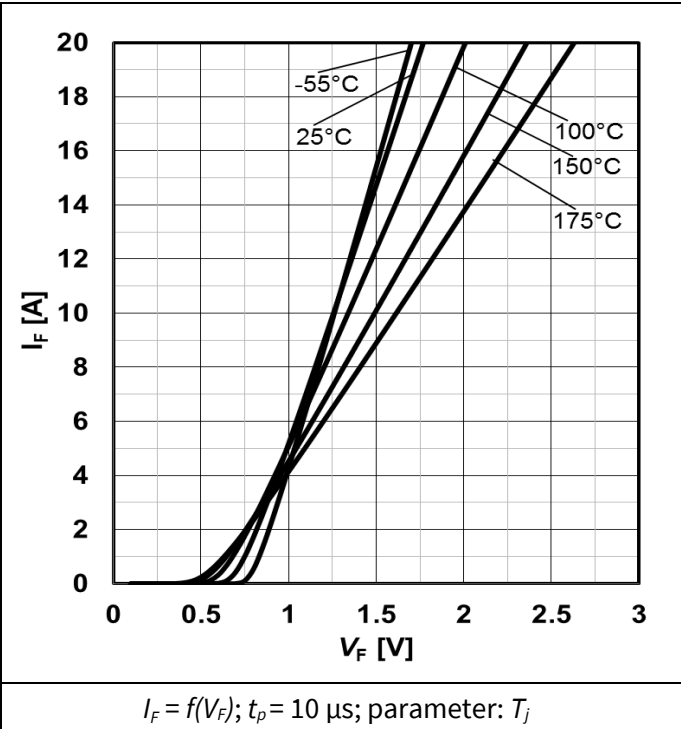


Figure 3 Typ. forward characteristics

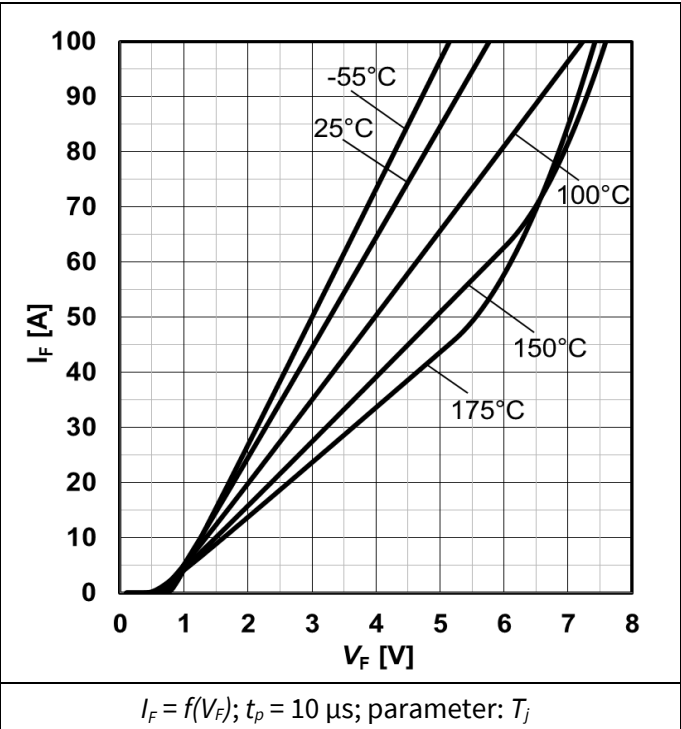


Figure 4 Typ. forward characteristics
in surge current

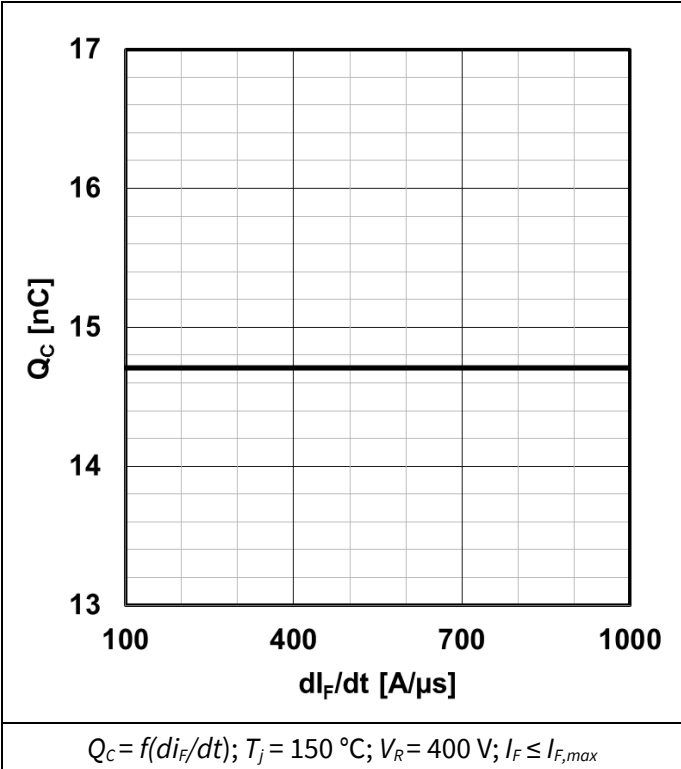


Figure 5 Typ. cap. charge vs. current slope

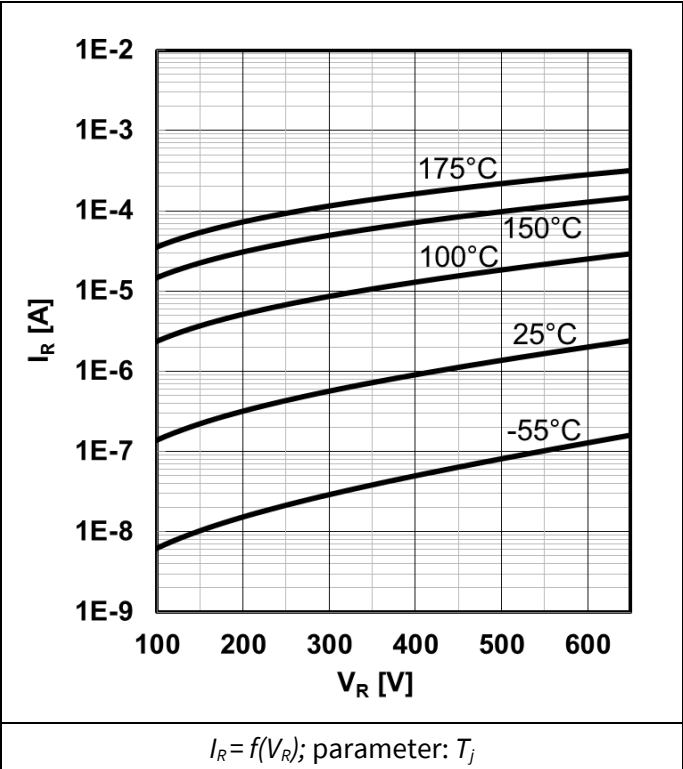


Figure 6 Typ. reverse current vs. reverse voltage

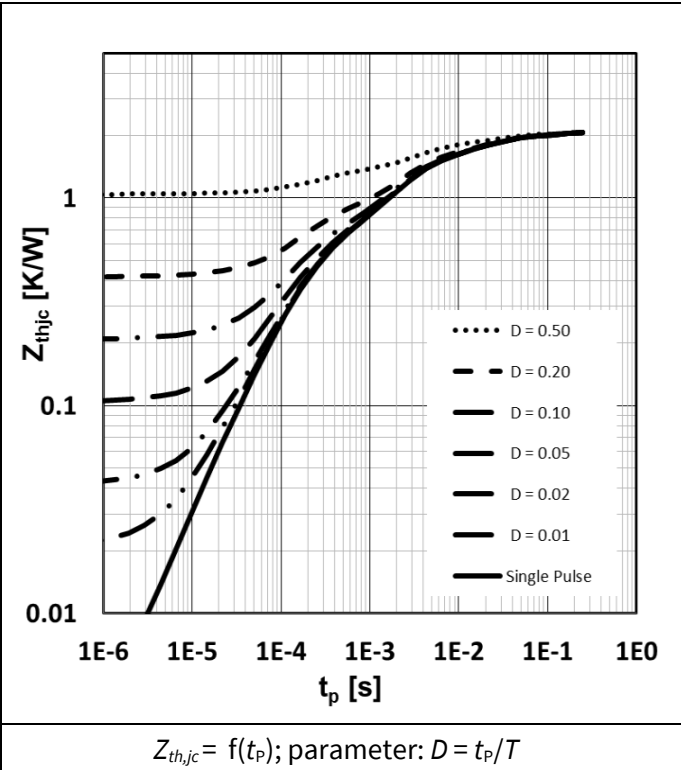


Figure 7 Max. transient thermal impedance

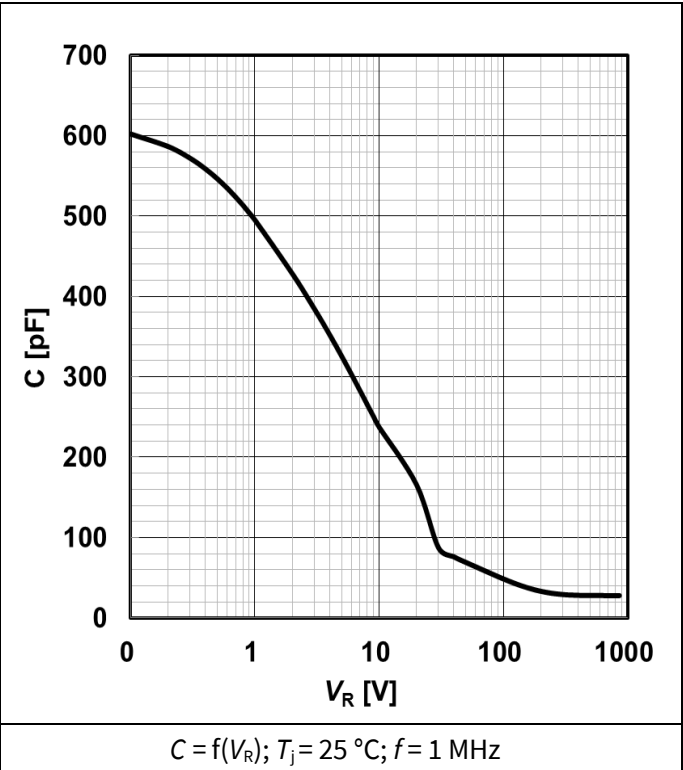


Figure 8 Typ. capacitance vs. reverse voltage

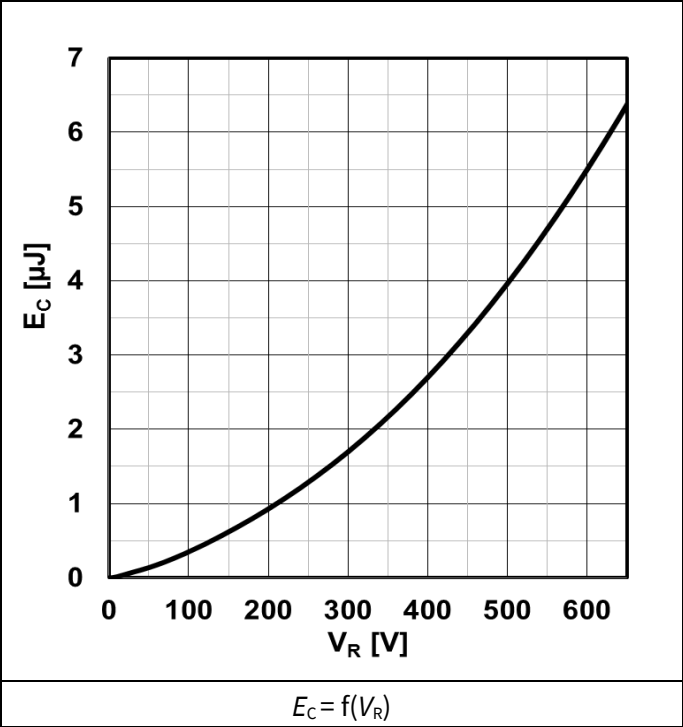


Figure 9 Typ. capacitance stored energy

5 Simplified forward characteristic

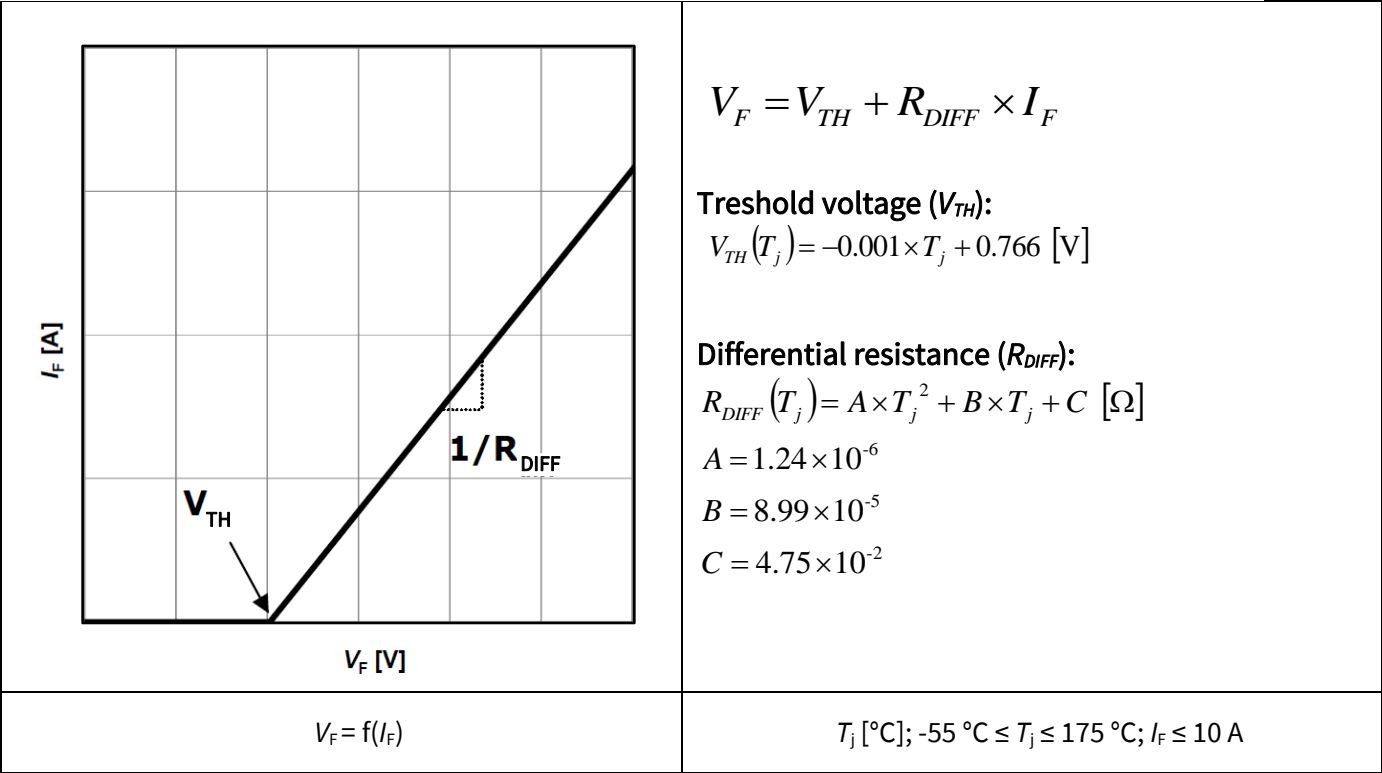


Figure 10 Equivalent forward current curve

Figure 11 Mathematical Equation

6 Package outlines

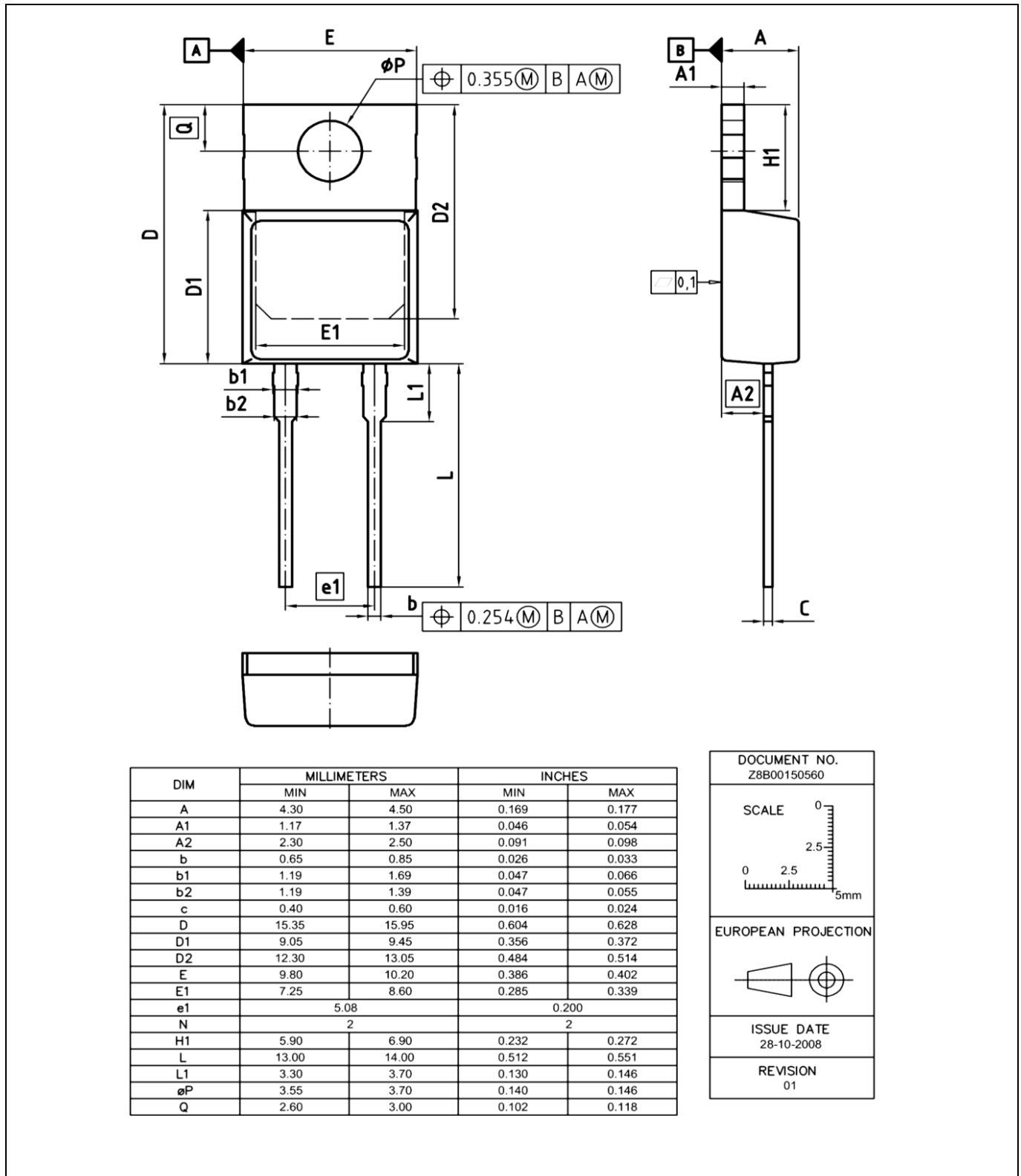


Figure 12 Outlines of the package PG-TO220-2, dimensions in mm/inches

Revision History

Major changes since the last revision

Revision	Date	Subject (major changes since last revision)
2.0	2017-05-23	Release of final version

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