

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

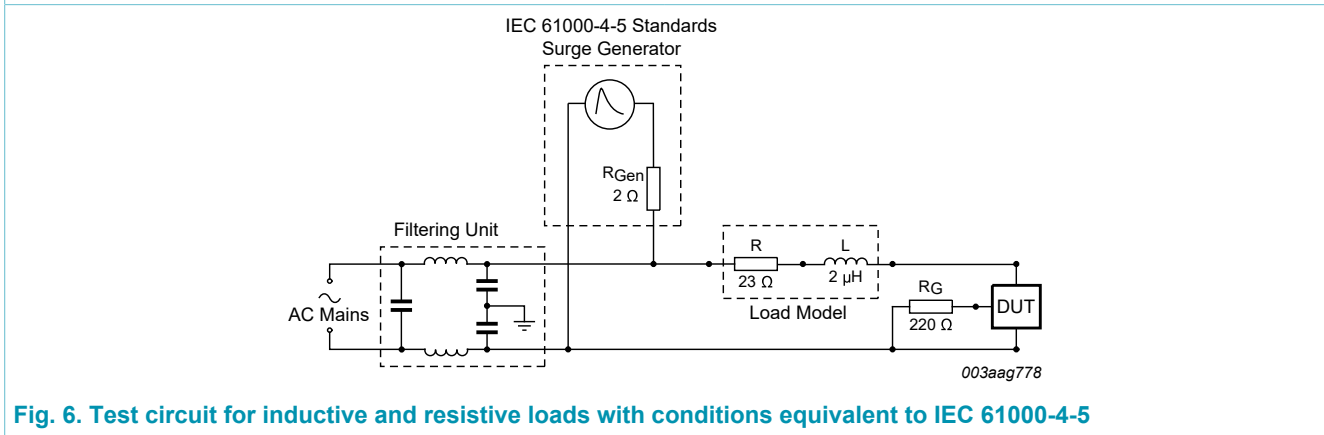
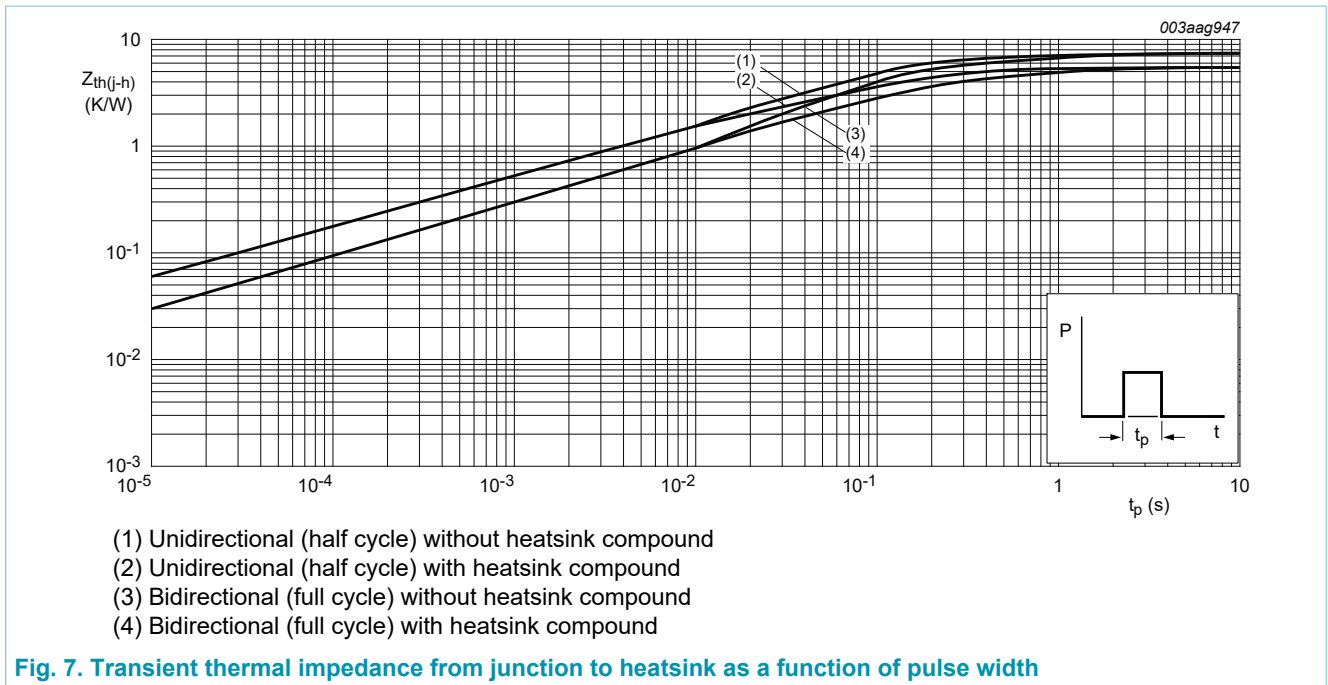


Fig. 6. Test circuit for inductive and resistive loads with conditions equivalent to IEC 61000-4-5

8. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
R _{th(j-h)}	thermal resistance from junction to heatsink	full cycle or half cycle; with heatsink compound; Fig. 7	-	-	5.5	K/W
		full cycle or half cycle; without heatsink compound; Fig. 7	-	-	7.2	K/W
R _{th(j-a)}	thermal resistance from junction to ambient free air	in free air	-	55	-	K/W



9. Isolation characteristics

Table 6. Isolation characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{isol(RMS)}	RMS isolation voltage	from all terminals to external heatsink; sinusoidal waveform; clean and dust free; 50 Hz ≤ f ≤ 60 Hz; T _h = 25 °C	-	-	2500	V
C _{isol}	isolation capacitance	from main terminal 2 to external heatsink; f = 1 MHz; T _h = 25 °C	-	10	-	pF

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
I _{GT}	gate trigger current	V _D = 12 V; I _T = 100 mA; LD+ G+; T _j = 25 °C; Fig. 8	-	-	35	mA
		V _D = 12 V; I _T = 100 mA; LD+ G-; T _j = 25 °C; Fig. 8	-	-	35	mA
		V _D = 12 V; I _T = 100 mA; LD- G-; T _j = 25 °C; Fig. 8	-	-	35	mA
I _L	latching current	V _D = 12 V; I _G = 100 mA; LD+ G+; T _j = 25 °C; Fig. 9	-	-	50	mA
		V _D = 12 V; I _G = 100 mA; LD+ G-; T _j = 25 °C; Fig. 9	-	-	60	mA
		V _D = 12 V; I _G = 100 mA; LD- G-; T _j = 25 °C; Fig. 9	-	-	50	mA
I _H	holding current	V _D = 12 V; T _j = 25 °C; Fig. 10	-	-	35	mA
V _T	on-state voltage	I _T = 6 A; T _j = 25 °C; Fig. 11	-	-	1.7	V
V _{GT}	gate trigger voltage	V _D = 12 V; I _T = 100 mA; T _j = 25 °C; Fig. 12	-	0.8	1	V
		V _D = 400 V; I _T = 100 mA; T _j = 125 °C; Fig. 12	0.2	0.45	-	V
I _D	off-state current	V _D = 800 V; T _j = 25 °C	-	-	10	μA
		V _D = 800 V; T _j = 125 °C	-	-	0.5	mA
V _{CL}	clamping voltage	I _{CL} = 0.1 mA; t _p = 1 ms; T _j = 25 °C	850	-	-	V
Dynamic characteristics						
dV _D /dt	rate of rise of off-state voltage	V _{DM} = 536 V; T _j = 125 °C; (V _{DM} = 67% of V _{DRM}); exponential waveform; gate open circuit; Fig. 13	1000	-	-	V/μs
dI _{com} /dt	rate of change of commutating current	V _D = 400 V; T _j = 125 °C; I _{T(RMS)} = 4 A; dV _{com} /dt = 20 V/μs; (snubberless condition); gate open circuit; Fig. 14 ; Fig. 15	8	-	-	A/ms
		V _D = 400 V; T _j = 125 °C; I _{T(RMS)} = 4 A; dV _{com} /dt = 10 V/μs; gate open circuit; Fig. 15 ; Fig. 16	10	-	-	A/ms
		V _D = 400 V; T _j = 125 °C; I _{T(RMS)} = 4 A; dV _{com} /dt = 1 V/μs; gate open circuit; Fig. 14 ; Fig. 15	15	-	-	A/ms

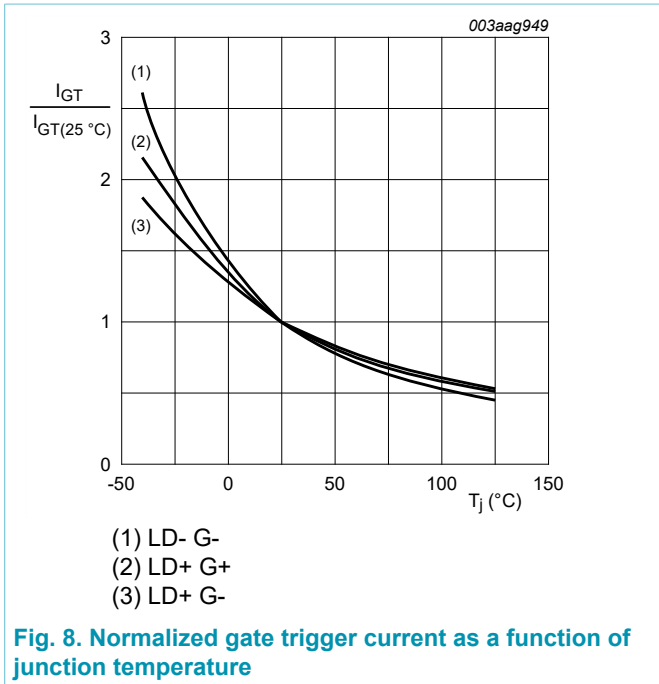


Fig. 8. Normalized gate trigger current as a function of junction temperature

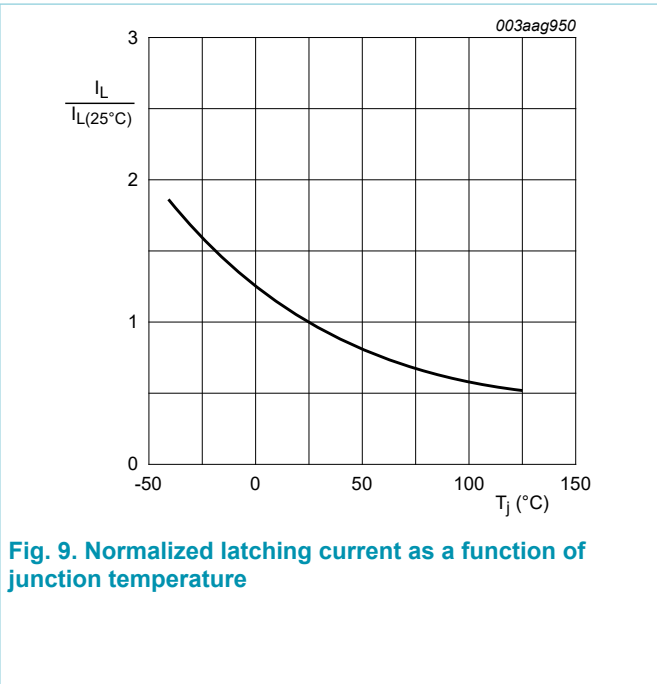


Fig. 9. Normalized latching current as a function of junction temperature

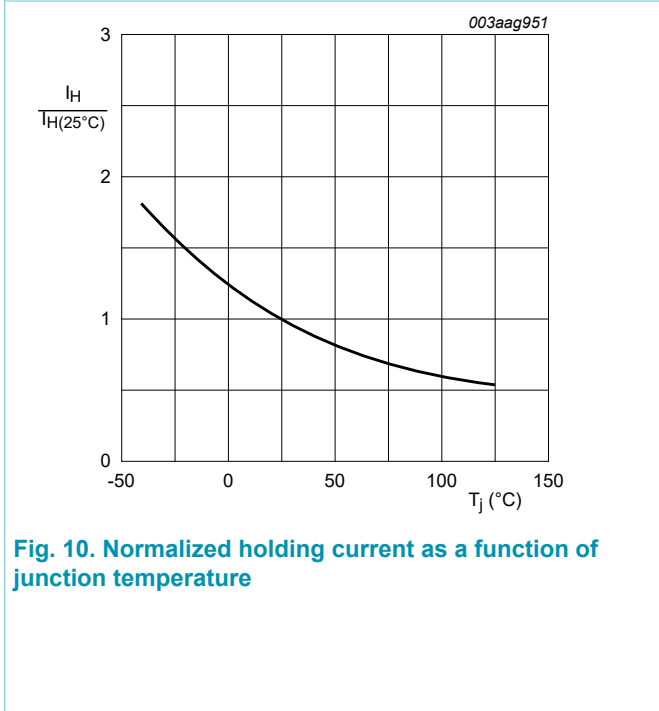


Fig. 10. Normalized holding current as a function of junction temperature

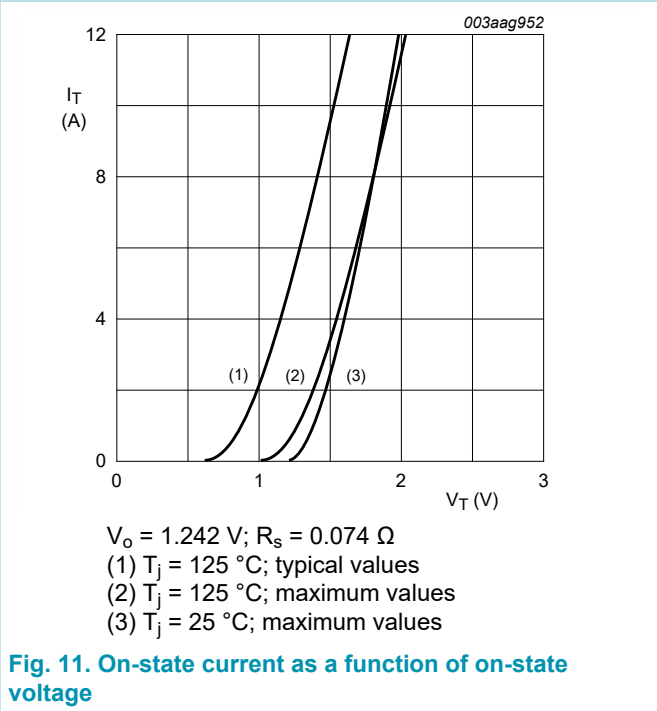


Fig. 11. On-state current as a function of on-state voltage

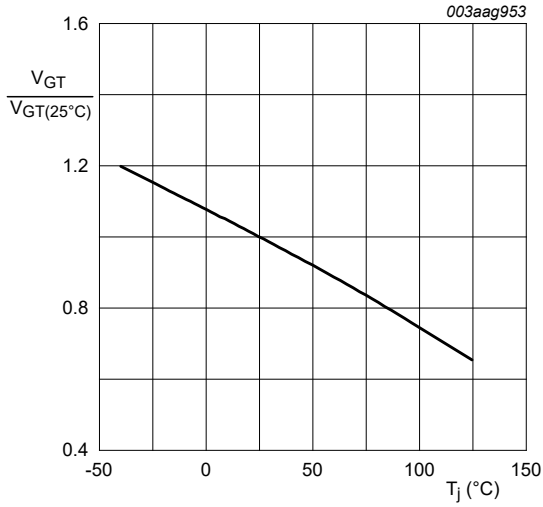
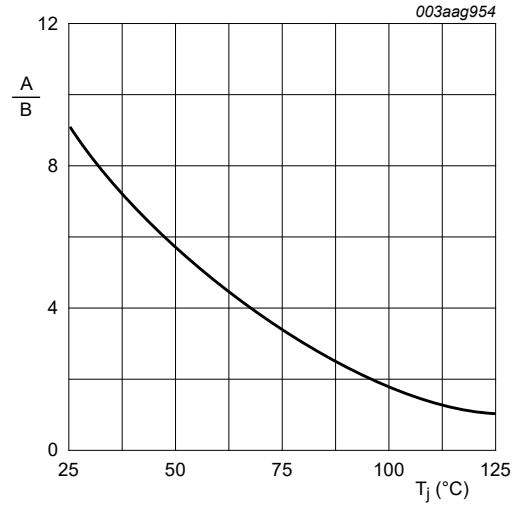
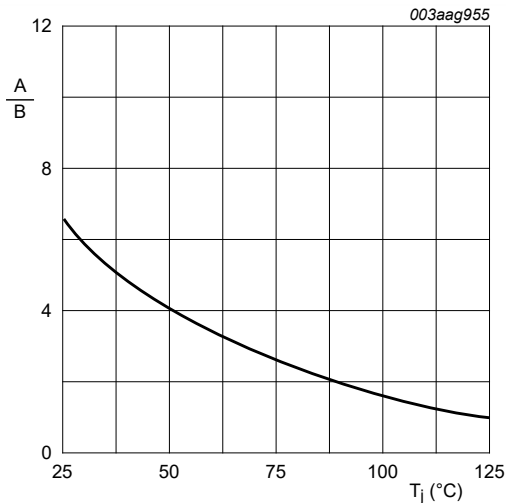


Fig. 12. Normalized gate trigger voltage as a function of junction temperature



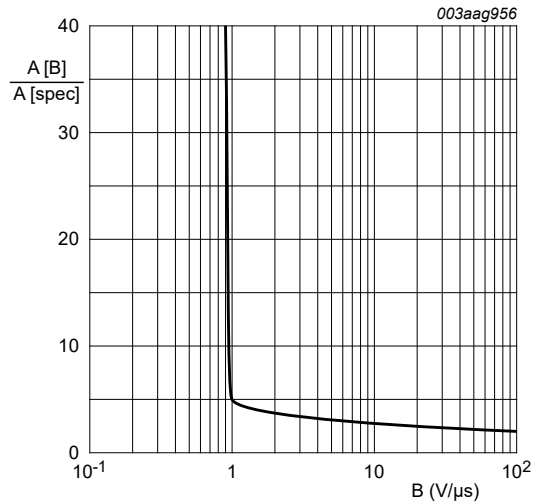
A = dV_D/dt at condition T_j °C
 B = dV_D/dt at condition T_j [125] °C

Fig. 13. Normalized rate of rise of off-state voltage as a function of junction temperature



A = di_{com}/dt at condition T_j °C
 B = di_{com}/dt at condition T_j [125] °C
 $V_D = 400$ V

Fig. 14. Normalized critical rate of rise of commutating current as a function of junction temperature



A [B] is di_{com}/dt at condition B, dV_{com}/dt
 A [spec] is the specified data sheet value of di_{com}/dt
 turn-off time < 20 ms

Fig. 15. Normalized critical rate of change of commutating current as a function of critical rate of change of commutating voltage; minimum values

$T_j = 25$ °C; $t_p = 300$ μs

Fig. 16. Output characteristics: drain current as a function of drain-source voltage; typical values

11. Package outline

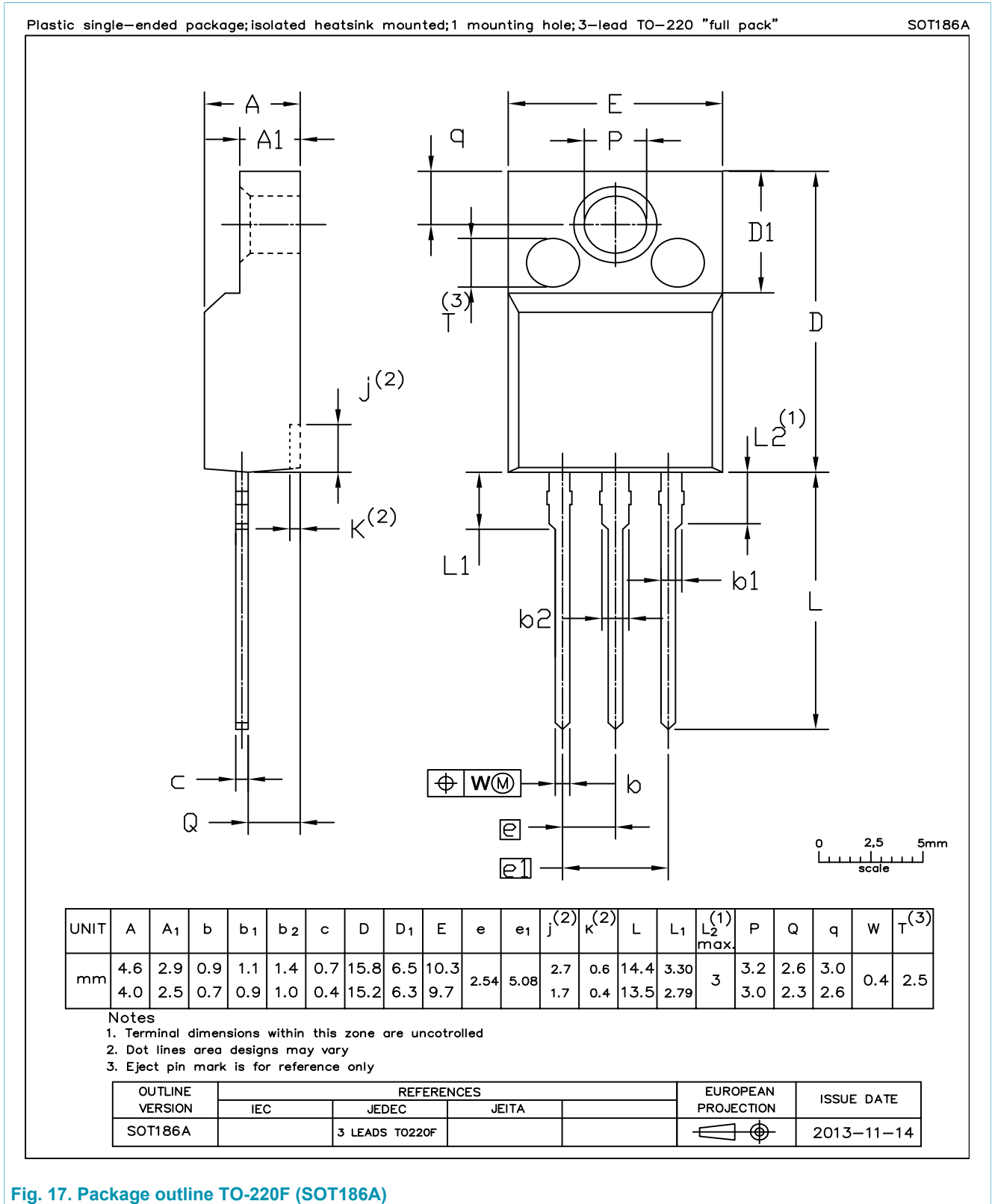


Fig. 17. Package outline TO-220F (SOT186A)

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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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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