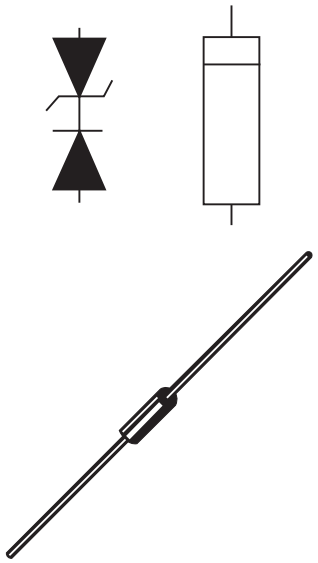
PKC-136

Application Specific Discretes
ASD™

PEAK CLAMP

MAIN PRODUCT CHARACTERISTICS

V_{BR}	160Vdc
V_{DRM}	700Vdc
P	1.5W



DO-15

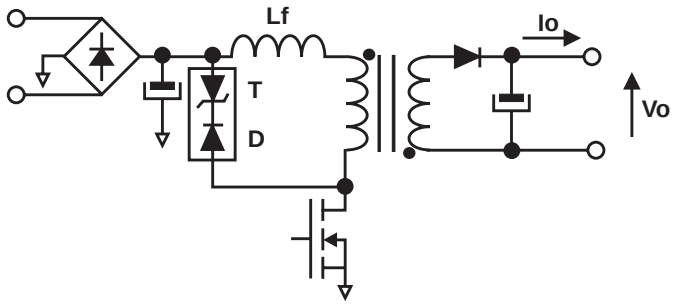
FEATURES

- Protection of the Mosfet in flyback power supply
- TRANSIL™ and blocking diode in a single package

BENEFITS

- Accurate voltage clamping regardless load
- Reduced current loop
- Reduced EMI emission
- High integration
- Fast assembly
- Reduced losses in stand by mode

BASIC CONNECTION



ABSOLUTE MAXIMUM RATINGS (limiting values)

Symbol	Parameter	Value	Unit
T_{stg}	Storage temperature	- 40 to + 150	°C
T_j	Junction temperature	150	°C
P	Maximum power dissipation T°lead = 90°C	1.5	W

ELECTRICAL CHARACTERISTICS TRANSIL

Symbol	Parameter	Test conditions		Value			Unit
				Min.	Typ.	Max.	
I_{RM}	Leakage current	V_R = 136V	T_j = 25°C			1	µA
			T_j =125°C			10	
V_{BR}	Breakdown voltage	I_R = 1mA pulse test < 50ms	T_j = 25°C	150	160	170	V
R_d	Dynamical Resistance	tp < 500ns between I = 0.5Amps and I = 1.5Amps	T_j = 125°C			4	Ω
αT	Temperature Coefficient					10.8	10^{-4}/°C
V_{sCL}	Surge Clamping voltage	Ipp = 2.7Amps 10/1000µs				219	V

CALCULATION OF THE CLAMPING VOLTAGE:

In repetitive mode and for low current rating, use the equation (1) and (2) to calculate the breakdown voltage V_{BR} of the transil versus the operating junction temperature and use the equation (3) to calculate the clamping voltage versus the transil current Ipp and the temperature.

$$\Delta V_{BR} = \alpha T(T_j - 25)V_{BR}(25°C) \quad (1)$$

$$V_{BR}(T_j) = V_{BR}(25°C) + \Delta V_{BR} \quad (2)$$

$$V_{CL}(T_j) = V_{BR}(T_j) + Rd.Ipp \quad (3)$$

ELECTRICAL CHARACTERISTICS DIODE (Tj = 25°C unless otherwise specified)

Symbol	Parameter	Tests conditions		Value			Unit
				Min.	Typ.	Max.	
I_R	Reverse leakage current	$V_R = V_{RRM}$	T_j = 25°C			3	µA
			T_j = 125°C		3	20	
V_{RRM}	Repetitive Peak Reverse Voltage	T_j = 25°C		700			V
trr	Reverse Recovery Time	I_F = 1A dI$_F$ / dt = -50A/µs V_R = 30V				45	ns
V_{FP}	Peak Forward Voltage	I_F = 3A dI$_F$ / dt = 100A/µs	T_j = 25°C			12	V
			T_j = 125°C			18	

CAPACITANCE

Symbol	Parameter	Typical Value	Unit
C	Total Parasitic capacitance 1MHz 30mV	35	pF

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to leads L = 10mm	40	°C/W
$R_{th(j-a)}$	Junction to ambiant condition see note 1	105	°C/W

Note 1: Device mounted on a epoxy FR4 board of 35µm thickness
Lead Length: 10mm
Pad diameter: 4mm
Track width: 1mm
Track length: 25mm
The $Rth_{(j-a)}$ can be reduced by replacing the Cu track by plan:
S(Cu) = 1.5cm^2/lead $R_{th(j-a)}$ = 65°C/W
S(Cu) = 3.5cm^2/lead $R_{th(j-a)}$ = 60°C/W

Fig. 1: Peak pulse power versus exponential pulse duration.

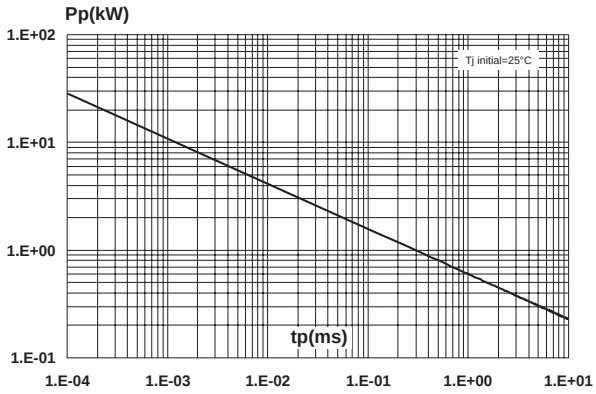


Fig. 2: Relative variation of peak pulse power versus initial junction temperature.

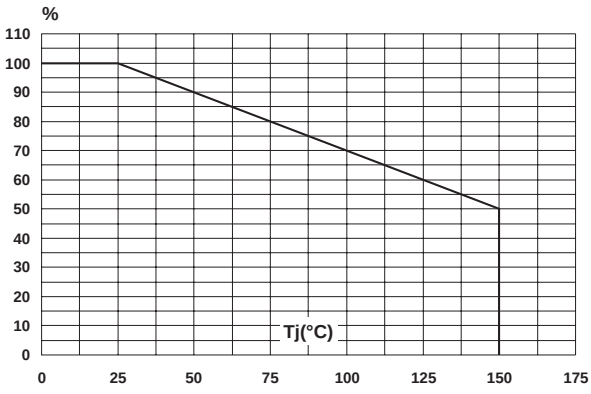


Fig. 3: Average power dissipation versus ambient temperature.

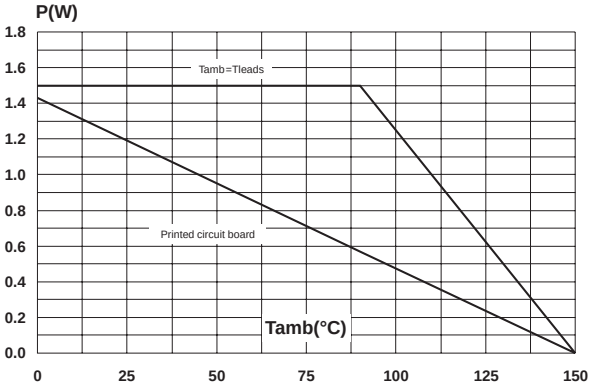


Fig. 4: Variation of thermal impedance junction to ambient versus pulse duration (printed circuit board epoxy FR4)

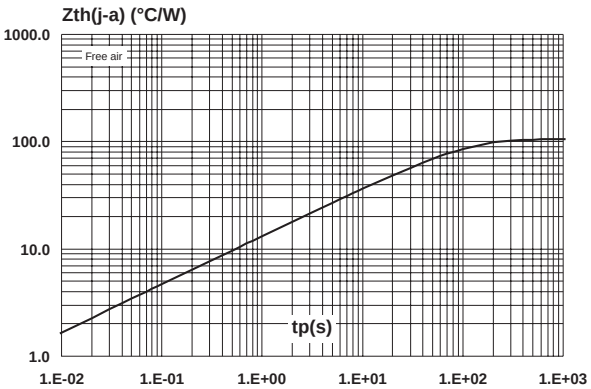


Fig. 5: Thermal resistance junction to ambient versus copper surface under each lead.

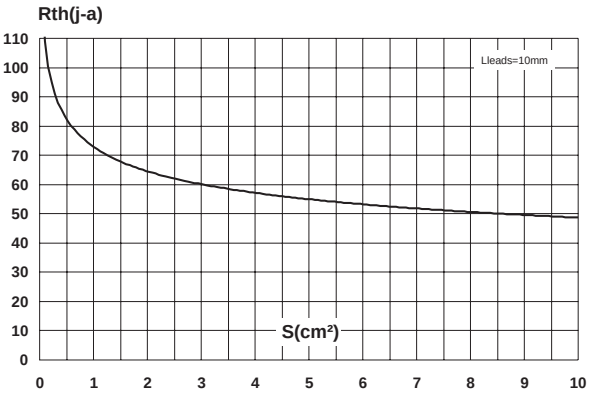


Fig. 6-1: Reverse leakage current versus reverse voltage applied (typical values, for Transil).

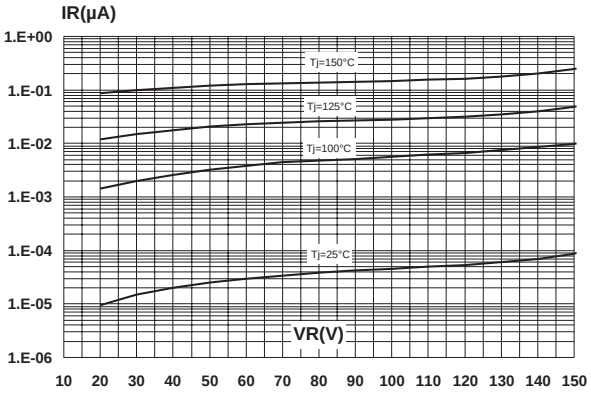


Fig. 6-2: Reverse leakage current versus reverse voltage applied (typical values, for diode).

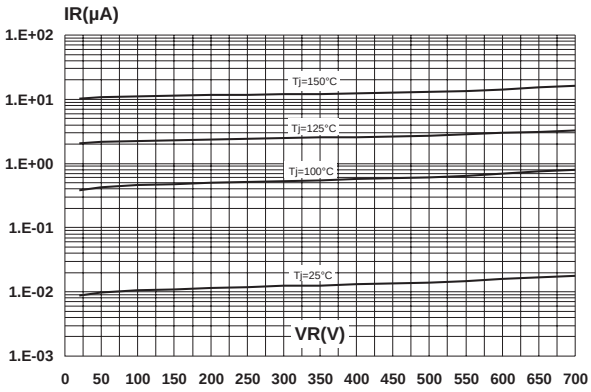


Fig. 7: Transient peak forward voltage versus d_{IF}/dt (90% confidence).

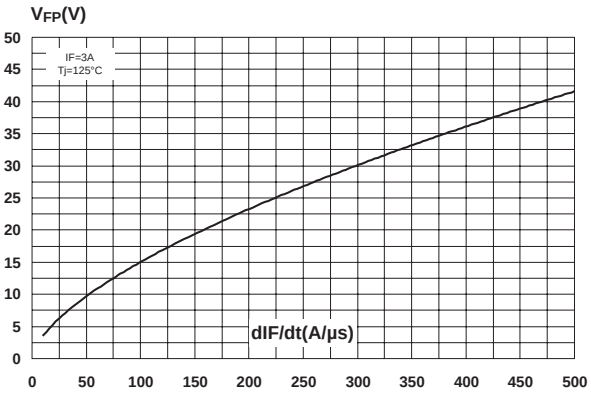


Fig. 8: Clamping voltage versus peak pulse current (maximum values).

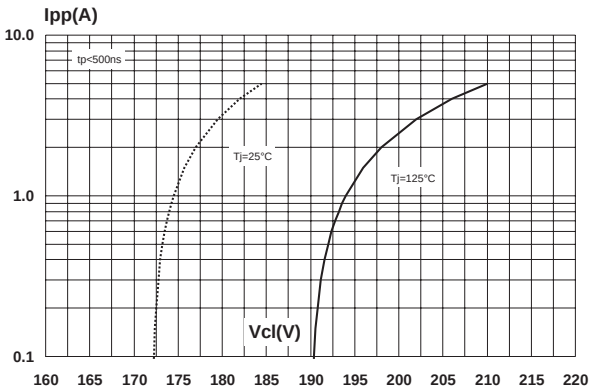
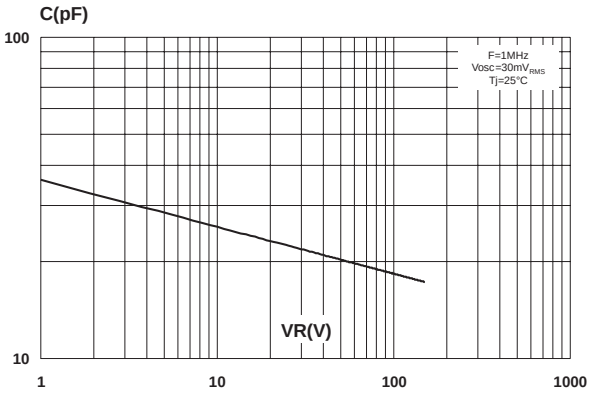
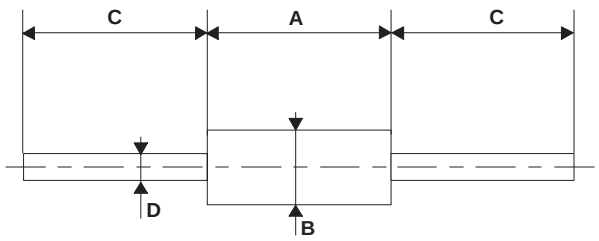


Fig. 9: Junction capacitance versus reverse voltage applied on clamping characteristic (typical values).



PACKAGE MECHANICAL DATA

DO-15



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	6.05	6.75	0.238	0.266
B	2.95	3.53	0.116	0.139
C	26	31	1.024	1.220
D	0.71	0.88	0.028	0.035

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
PKC136	Partnumber Diode cathode ring	DO-15	0.4g	1000	Ammopack
PKC136-RL	Partnumber Diode cathode ring	DO-15	0.4g	6000	Tape and reel