



# PKC-136

Application Specific Discretes  
ASD™

PEAK CLAMP

## MAIN PRODUCT CHARACTERISTICS

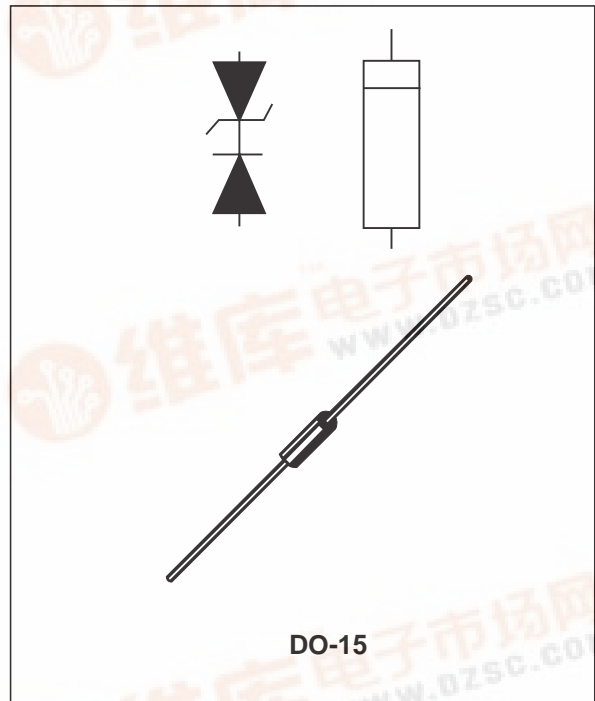
$V_{BR}$	160Vdc
$V_{DRM}$	700Vdc
P	1.5W

## FEATURES

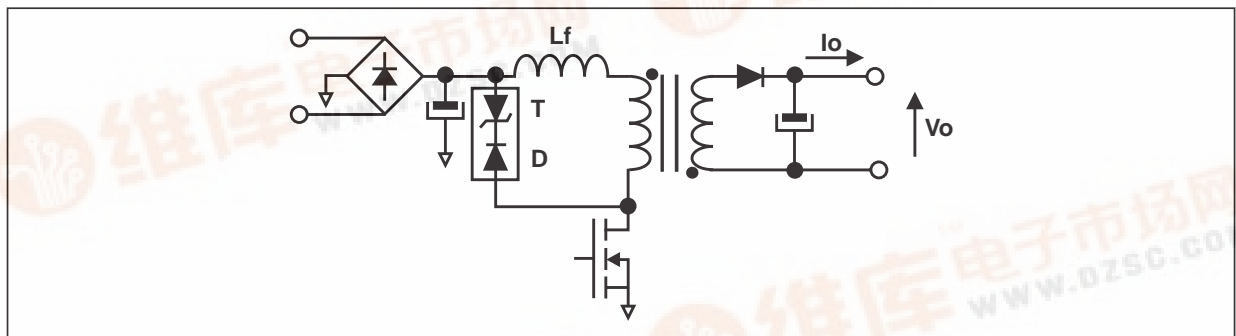
- Protection of the Mosfet in flyback power supply
- TRANSIL™ and blocking diode in a single package

## 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 $T^{\circ}lead = 90^{\circ}C$	1.5	W

## PKC-136

### ELECTRICAL CHARACTERISTICS TRANSIL

Symbol	Parameter	Test conditions		Value			Unit
				Min.	Typ.	Max.	
I <sub>RM</sub>	Leakage current	V <sub>R</sub> = 136V	T <sub>j</sub> = 25°C			1	μA
			T <sub>j</sub> = 125°C			10	
V <sub>BR</sub>	Breakdown voltage	I <sub>R</sub> = 1mA pulse test < 50ms	T <sub>j</sub> = 25°C	150	160	170	V
R <sub>d</sub>	Dynamical Resistance	tp < 500ns between I = 0.5Amps and I = 1.5Amps	T <sub>j</sub> = 125°C			4	Ω
α <sub>T</sub>	Temperature Coefficient					10.8	10 <sup>-4</sup> /°C
V <sub>sCL</sub>	Surge Clamping voltage	I <sub>pp</sub> = 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<sub>BR</sub> of the transil versus the operating junction temperature and use the equation (3) to calculate the clamping voltage versus the transil current I<sub>pp</sub> and the temperature.

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

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

$$V_{CL}(T_j) = V_{BR}(T_j) + R_d \cdot I_{pp} \quad (3)$$

### ELECTRICAL CHARACTERISTICS DIODE (T<sub>j</sub> = 25°C unless otherwise specified)

Symbol	Parameter	Tests conditions		Value			Unit
				Min.	Typ.	Max.	
I <sub>R</sub>	Reverse leakage current	V <sub>R</sub> = V <sub>RRM</sub>	T <sub>j</sub> = 25°C			3	μA
			T <sub>j</sub> = 125°C		3	20	
V <sub>RRM</sub>	Repetitive Peak Reverse Voltage	T <sub>j</sub> = 25°C		700			V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> = 1A   dI <sub>F</sub> / dt = -50A/μs V <sub>R</sub> = 30V				45	ns
V <sub>FP</sub>	Peak Forward Voltage	I <sub>F</sub> = 3A dI <sub>F</sub> / dt = 100A/μs	T <sub>j</sub> = 25°C			12	V
			T <sub>j</sub> = 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 ambient 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

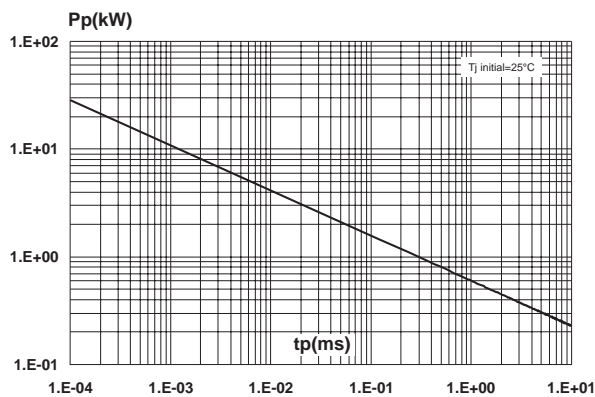
Track length: 25mm

The  $R_{th(j-a)}$  can be reduced by replacing the Cu track by plan:

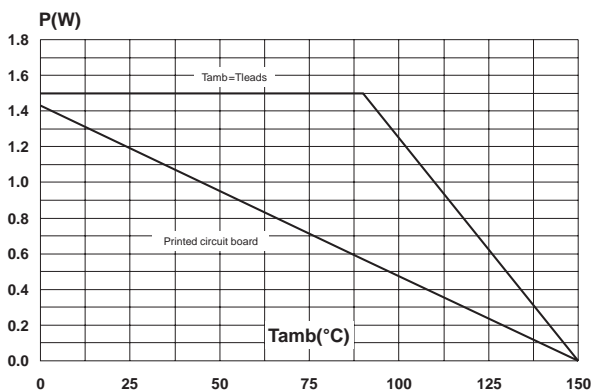
S(Cu) = 1.5cm<sup>2</sup>/lead  $R_{th(j-a)}$  = 65°C/W

S(Cu) = 3.5cm<sup>2</sup>/lead  $R_{th(j-a)}$  = 60°C/W

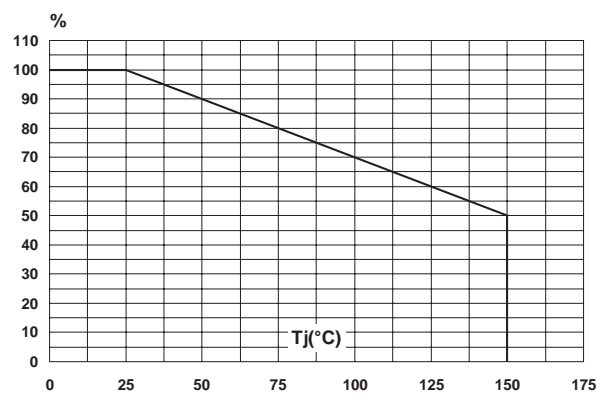
**Fig. 1:** Peak pulse power versus exponential pulse duration.



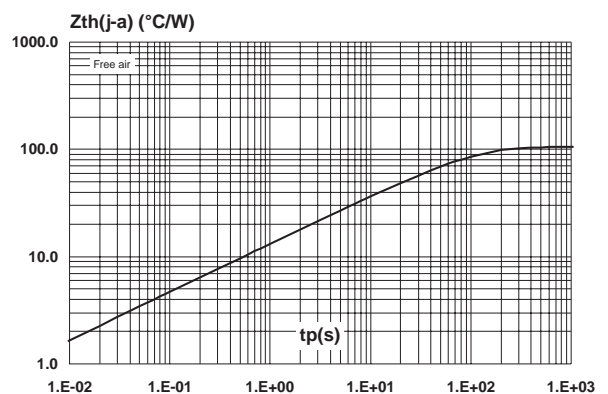
**Fig. 3:** Average power dissipation versus ambient temperature.



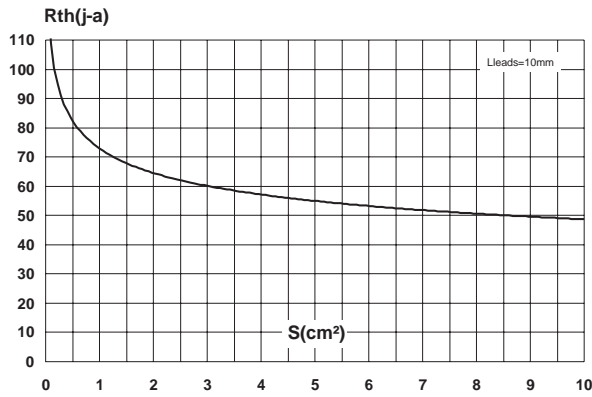
**Fig. 2:** Relative variation of peak pulse power versus initial junction temperature.



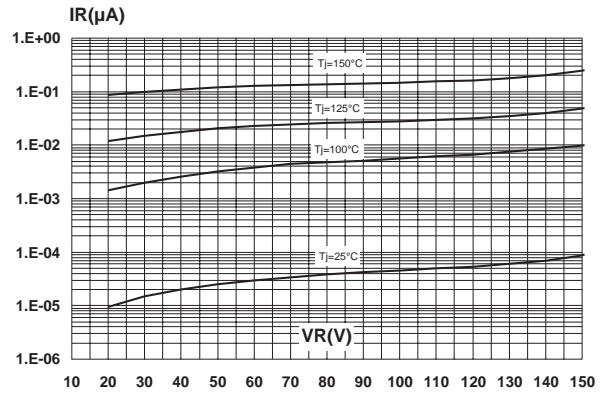
**Fig. 4:** Variation of thermal impedance junction to ambient versus pulse duration (printed circuit board epoxy FR4)



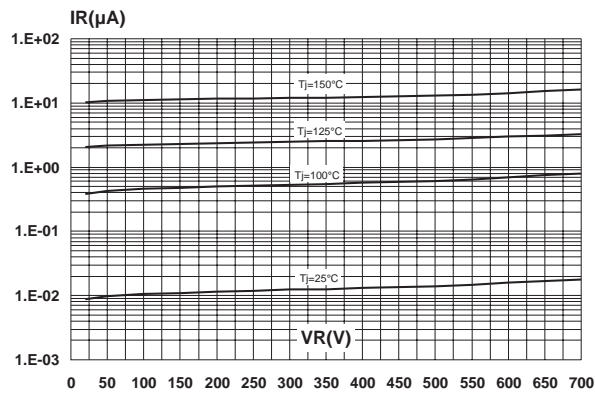
**Fig. 5:** Thermal resistance junction to ambient versus copper surface under each lead.



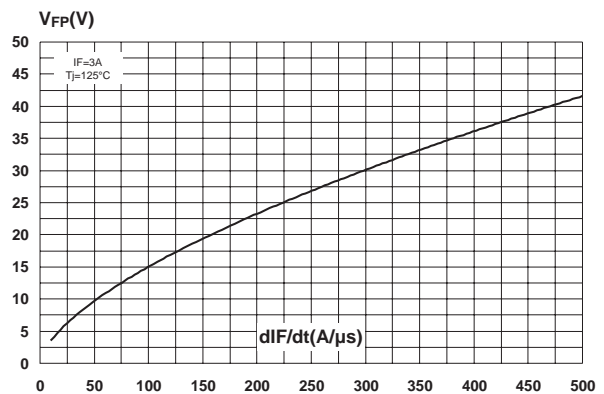
**Fig. 6-1:** Reverse leakage current versus reverse voltage applied (typical values, for Transil).



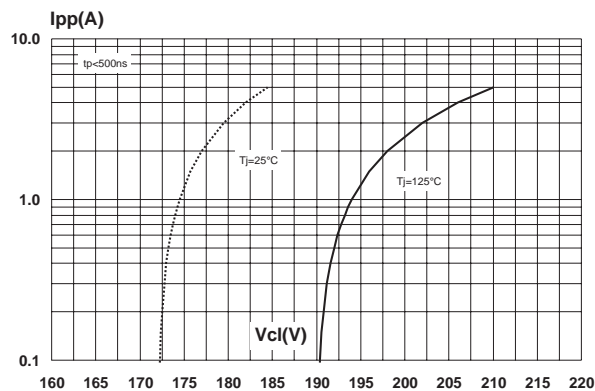
**Fig. 6-2:** Reverse leakage current versus reverse voltage applied (typical values, for diode).



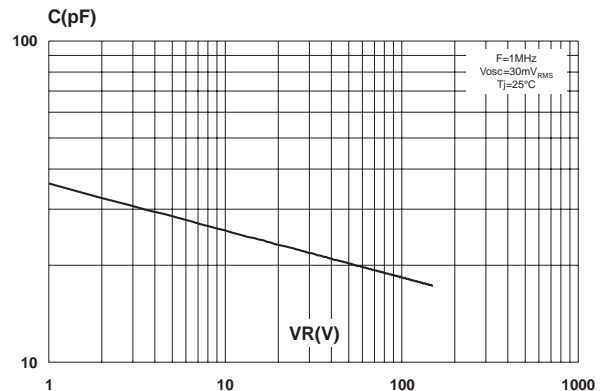
**Fig. 7:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



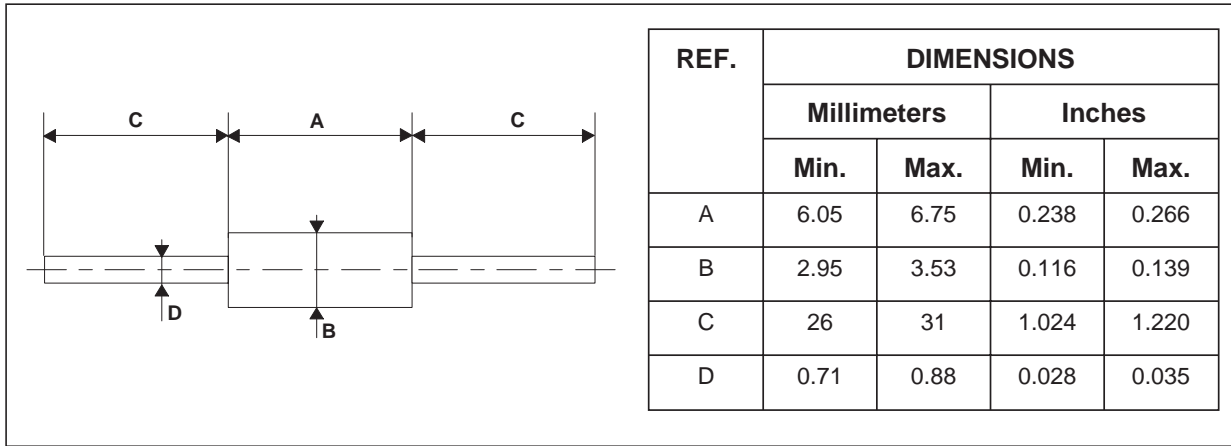
**Fig. 8:** Clamping voltage versus peak pulse current (maximum values).



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



**PACKAGE MECHANICAL DATA**  
DO-15



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

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