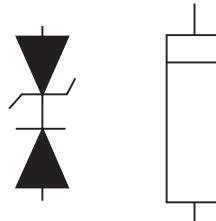


**Application Specific Discretes
ASD™**
PEAK CLAMP
MAIN PRODUCT CHARACTERISTICS

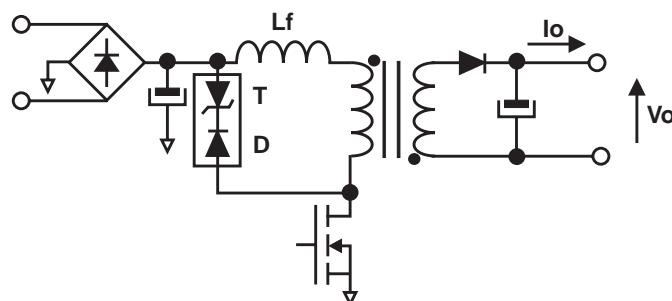
V_{BR}	160Vdc
V_{DRM}	700Vdc
P	1.5W


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

PKC-136

ELECTRICAL CHARACTERISTICS TRANSIL

Symbol	Parameter	Test conditions	Value			Unit	
			Min.	Typ.	Max.		
I_{RM}	Leakage current	$V_R = 136V$	$T_j = 25^\circ C$		1	μA	
			$T_j = 125^\circ C$		10		
V_{BR}	Breakdown voltage	$I_R = 1mA$ pulse test < 50ms	$T_j = 25^\circ C$	150	160	170	V
R_d	Dynamical Resistance	$t_p < 500ns$ between $I = 0.5Amps$ and $I = 1.5Amps$	$T_j = 125^\circ C$		4	Ω	
αT	Temperature Coefficient				10.8	$10^{-4}/^\circ C$	
V_{sCL}	Surge Clamping voltage	$I_{pp} = 2.7Amps$ $10/1000\mu s$			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 I_{pp} 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 ($T_j = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Tests conditions	Value			Unit
			Min.	Typ.	Max.	
I_R	Reverse leakage current	$V_R = V_{RRM}$	$T_j = 25^\circ C$		3	μA
			$T_j = 125^\circ C$		3	
V_{RRM}	Repetitive Peak Reverse Voltage	$T_j = 25^\circ C$	700			V
trr	Reverse Recovery Time	$I_F = 1A$ $dI_F / dt = -50A/\mu s$ $V_R = 30V$			45	ns
V_{FP}	Peak Forward Voltage	$I_F = 3A$ $dI_F / dt = 100A/\mu s$	$T_j = 25^\circ C$		12	V
			$T_j = 125^\circ C$		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 $L = 10\text{mm}$	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 $35\mu\text{m}$ 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:

$$S(\text{Cu}) = 1.5\text{cm}^2/\text{lead} \quad R_{th(j-a)} = 65^\circ\text{C/W}$$

$$S(\text{Cu}) = 3.5\text{cm}^2/\text{lead} \quad R_{th(j-a)} = 60^\circ\text{C/W}$$

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

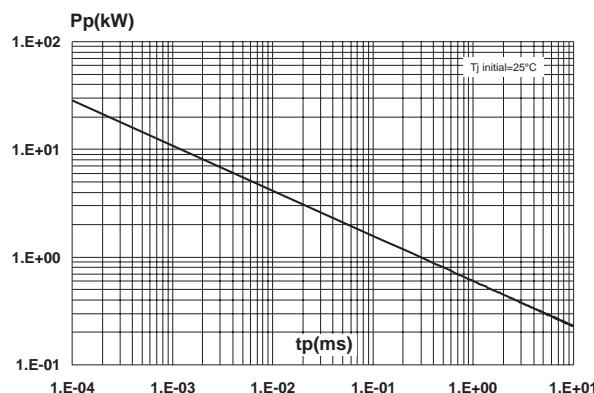


Fig. 2: Relative variation of peak pulse power versus initial junction temperature.

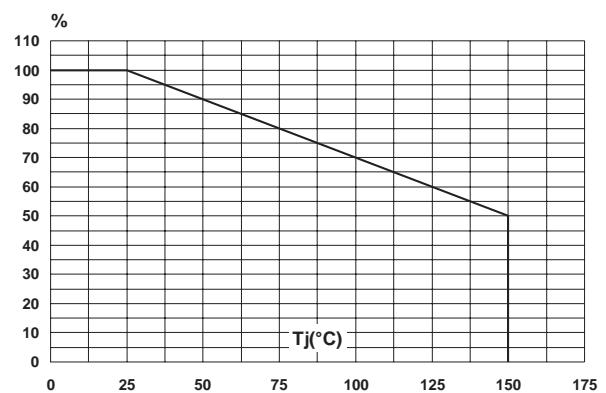


Fig. 3: Average power dissipation versus ambient temperature.

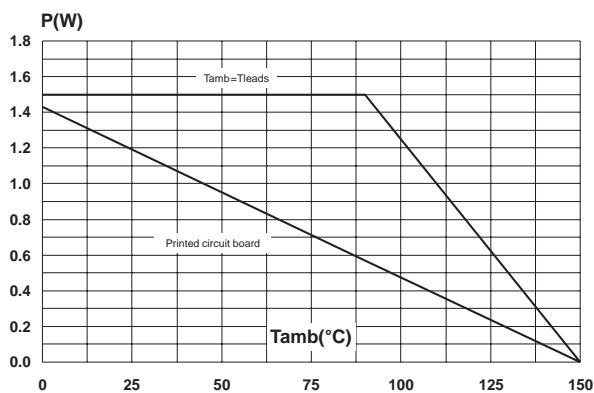


Fig. 4: Variation of thermal impedance junction to ambient versus pulse duration (printed circuit board epoxy FR4)

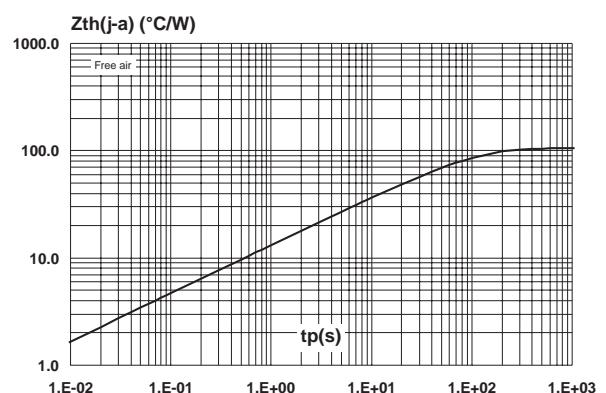


Fig. 5: Thermal resistance junction to ambient versus copper surface under each lead.

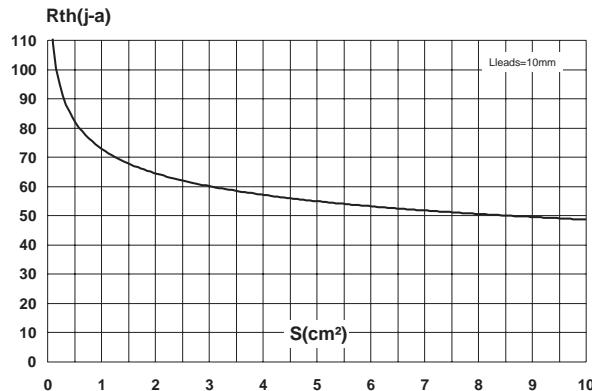


Fig. 6-2: Reverse leakage current versus reverse voltage applied (typical values, for diode).

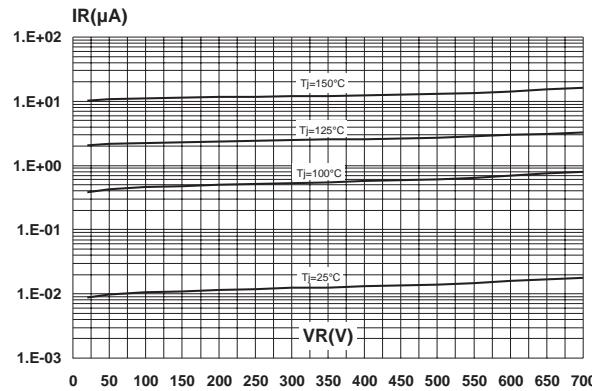


Fig. 8: Clamping voltage versus peak pulse current (maximum values).

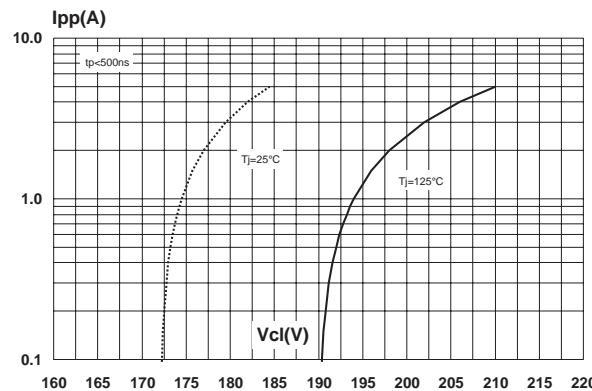


Fig. 6-1: Reverse leakage current versus reverse voltage applied (typical values, for Transil).

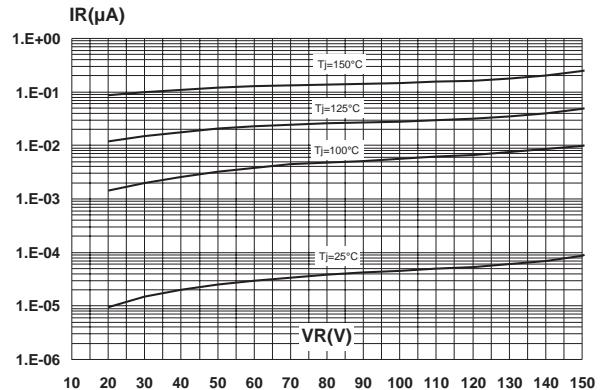


Fig. 7: Transient peak forward voltage versus dI_F/dt (90% confidence).

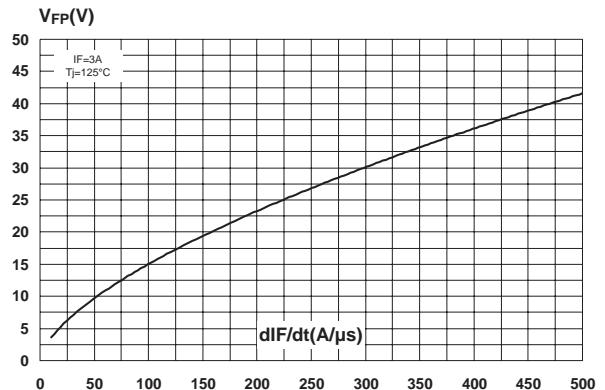
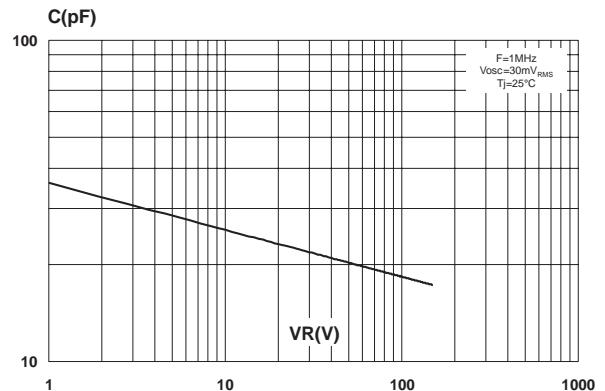


Fig. 9: Junction capacitance versus reverse voltage applied on clamping characteristic (typical values).



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

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