PROTEK DEVICES
Only One Name Means ProTek'Tion™

PKFC3.3C* thru PKFC36C*

PACKAGED FLIP CHIP ARRAY

APPLICATIONS

✔ Cellular Phones
✔ MCM Boards
✔ Wireless Communication Circuits
✔ IR LEDs
✔ SMART & PCMCIA Cards

IEC COMPATIBILITY (EN61000-4)

✔ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
✔ 61000-4-4 (EFT): 40A - 5/50ns

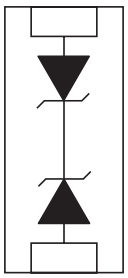
FEATURES

✔ ***CHIP SCALE PACKAGE 0.050" (1.270mm) x 0.030" (0.762mm)***
✔ ESD Protection > 25 kilovolts
✔ Available in Multiple Voltage Types Ranging From 3.3V to 36V
✔ 250 Watts Peak Pulse Power per Line (tp = 8/20µs)
✔ Bidirectional Configuration & Monolithic Structure
✔ Protects 1 Line
✔ RoHS Compliant in Lead-Free Versions

MECHANICAL CHARACTERISTICS

✔ Encapsulated 0502 Chip
✔ Weight 0.73 milligrams (Approximate)
✔ Available in Tin-Lead or Lead-Free Pure-Tin Plating(Annealed)
✔ Solder Reflow Temperature:
  Tin-Lead - Sn/Pb, 85/15: 240-245°C
  Pure-Tin - Sn, 100: 260-270°C
✔ Flammability Rating UL 94V-0
✔ 8mm Plastic & Paper Tape and Reel Per EIA Standard 481
✔ Device Marking On Reel

PIN CONFIGURATION



DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (t_p = 8/20µs) - See Figure 1	P_{PP}	250	Watts
Operating Temperature	T_J	-55°C to 150°C	°C
Storage Temperature	T_{STG}	-55°C to 150°C	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (See Note 1)	DEVICE MARKING CODE	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ I_P = 1A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @8/20µs V_C @ I_{PP}	MAXIMUM LEAKAGE CURRENT (See Note 2) @V_{WM} I_D µA	TYPICAL CAPACITANCE @0V, 1 MHz C pF
PKFC3.3C	03	3.3	4.0	7.0	12.5V @ 20A	75*	150
PKFC05C	05	5.0	6.0	9.8	14.7V @ 17A	10**	100
PKFC08C	08	8.0	8.5	13.4	19.2V @ 13A	10***	75
PKFC12C	12	12.0	13.3	19.0	29.7V @ 9.0A	1	50
PKFC15C	15	15.0	16.7	24.0	35.7V @ 7.0A	1	40
PKFC24C	24	24.0	26.7	43.0	55.0V @ 5.0A	1	30
PKFC36C	36	36.0	40.0	64.0	84.0V @ 3.0A	1	25

Note 1: All devices are bidirectional. Electrical characteristics apply in both directions.
Note 2: *Typical leakage current < 5µA @ 2.8V. **Typical leakage current <500nA @ 3.3V. ***Typical leakage current <200nA @ 5V.

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

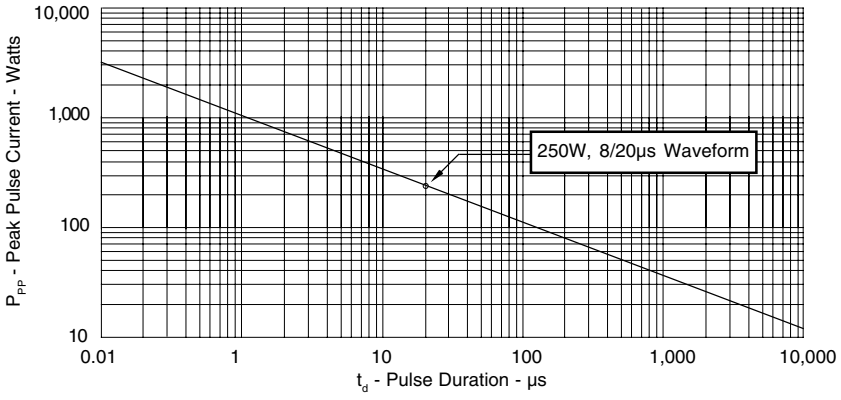
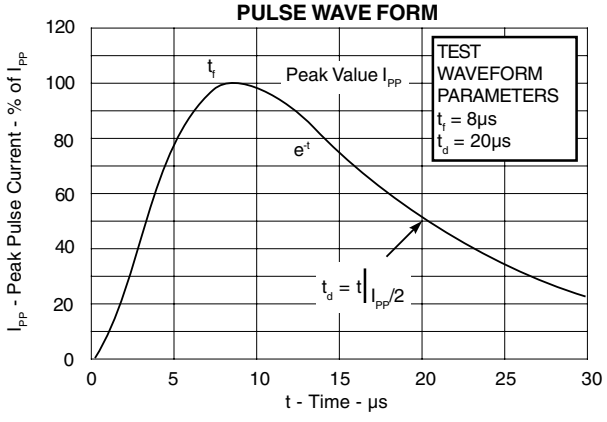


FIGURE 2
PULSE WAVE FORM



*PATENT PENDING

GRAPHS

FIGURE 3
POWER DERATING CURVE

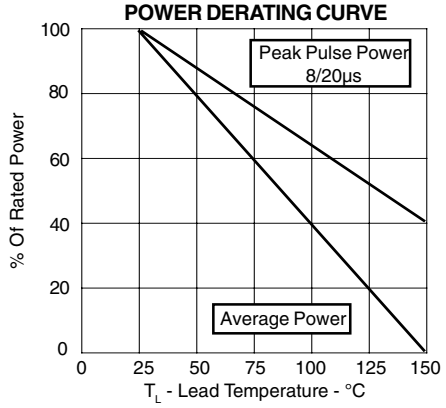


FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE FOR PKFC05C

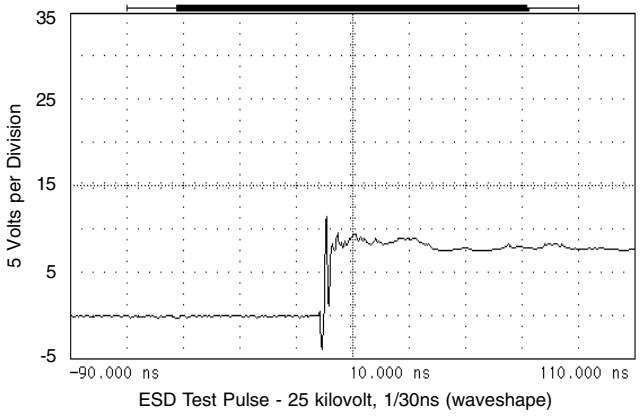
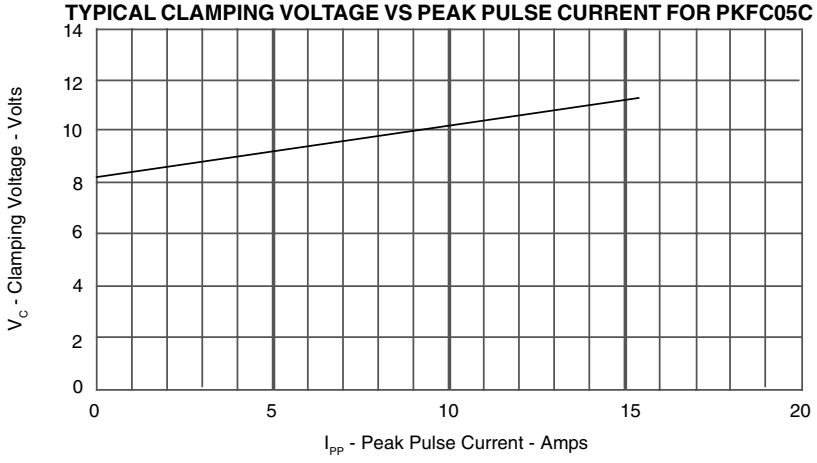


FIGURE 5
TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT FOR PKFC05C



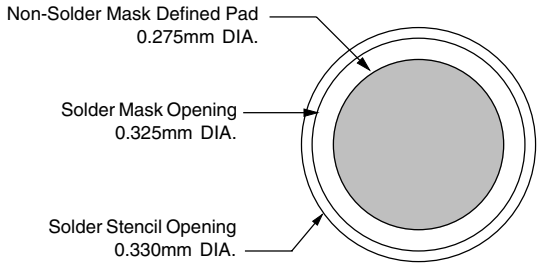
APPLICATION INFORMATION

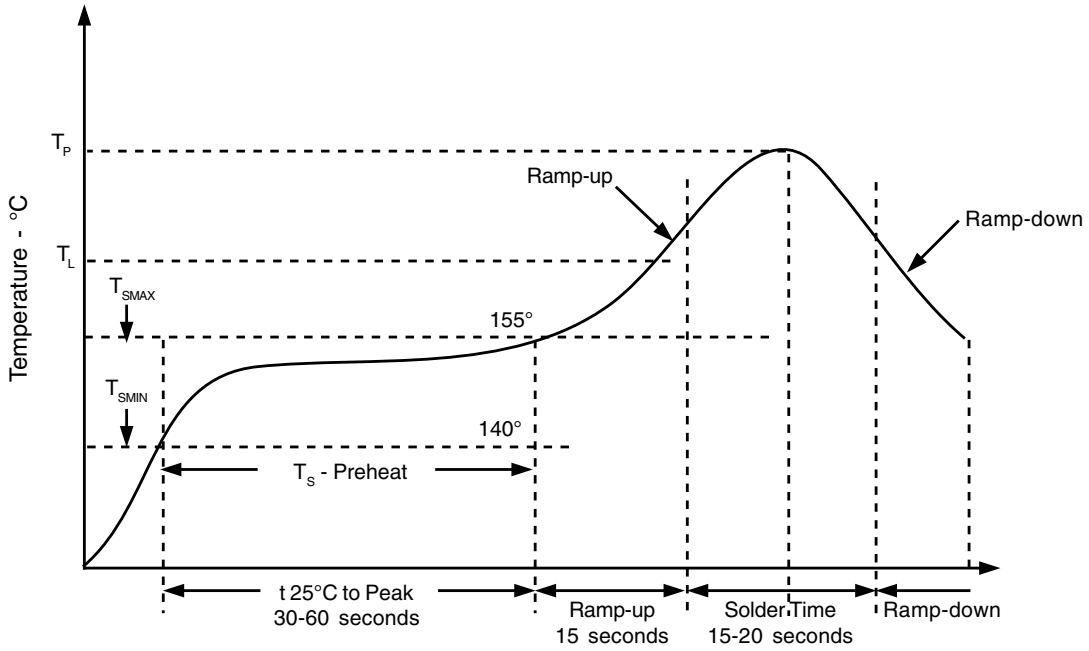
PRINTED CIRCUIT BOARD RECOMMENDATIONS	
PARAMETER	VALUE
Pad Size on PCB	0.275mm
Pad Shape	Round
Pad Definition	Non-Solder Mask Defined Pads
Solder Mask Opening	0.325mm Round
Solder Stencil Thickness	0.150mm
Solder Stencil Aperture Opening (laser cut, 5% tapered walls)	0.330mm Round
Solder Paste Type	No Clean
Pad Protective Finish	OSP(Entek Cu Plus 106A)
Tolerance - Edge To Corner Ball	±50µm
Solder Ball Side Coplanarity	±20µm
Maximum Dwell Time Above Liquidous (183°C)	60 Seconds
Soldering Maximum Temperature	270°C

REQUIREMENTS

Temperature:
T_P for Lead-Free (SnAgCu): 260-270°C
T_P for Tin-Lead: 240-245°C
Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area & plating.

RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION

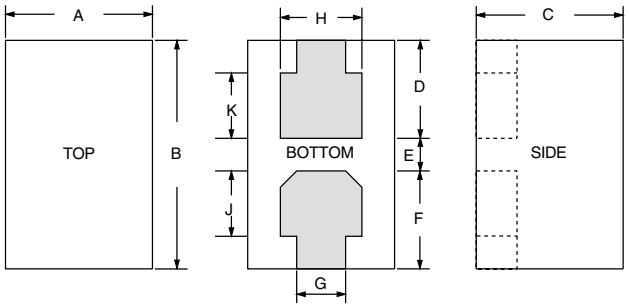




*PATENT PENDING

PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE

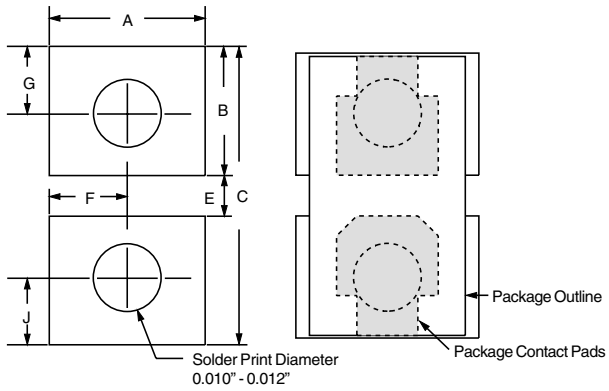


PACKAGE DIMENSIONS

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.73	0.76	0.79	0.029	0.030	0.031
B	1.22	1.27	1.32	0.048	0.050	0.052
C	0.73	0.76	0.79	0.029	0.030	0.031
D	0.54	0.57	0.60	0.021	0.023	0.024
E	0.10	0.13	0.16	0.004	0.005	0.006
F	0.55	0.58	0.61	0.022	0.023	0.024
G	0.27	0.30	0.33	0.011	0.012	0.013
H	0.38	0.41	0.44	0.015	0.016	0.017
J	0.35	0.38	0.41	0.014	0.015	0.016
K	0.35	0.38	0.41	0.014	0.015	0.016

NOTES
1. Controlling dimensions in inches.
2. Decimal tolerances for mounting pad : ± 0.003" (± 0.08mm).
3. Maximum size: 0.052" (1.321mm) by 0.036" (0.914mm).
4. All dimensions ±0.003" on package outline.

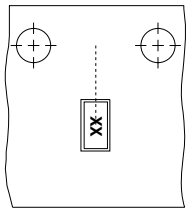
MOUNTING PAD



PAD DIMENSIONS

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.00	1.02	1.04	0.039	0.040	0.041
B	0.62	0.64	0.66	0.024	0.025	0.026
C	1.44	1.47	1.50	0.056	0.058	0.060
E	0.18	0.20	0.22	0.007	0.008	0.009
F	0.49	0.51	0.53	0.019	0.020	0.021
G	0.31	0.33	0.35	0.012	0.013	0.014
J	0.31	0.33	0.35	0.012	0.013	0.014

TAPE & REEL ORIENTATION



NOTE
1. Top view of tape. Solder PADS face down in tape package.

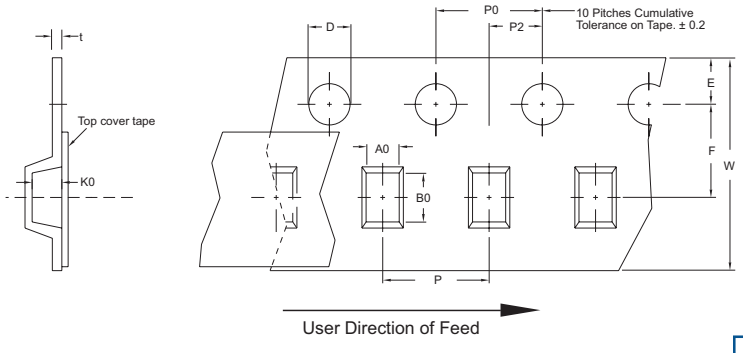
Outline & Dimensions: Rev 1 - 8/03, 06040

TAPE & REEL ORDERING NOMENCLATURE

1. Surface mount product is taped and reeled in accordance with EIA 481.
2. *8mm Plastic Tape:* 7 Inch Reels - 5,000 pieces per reel. Ordering Suffix: -T75-1 (i.e., PKFC05C-T75-1).
3. Suffix - LF = Lead-Free, Pure-Tin Plating, i.e., *PKFC05C-LF-T75-1.*

Tape & Reel Specifications (Dimensions in millimeters)

Reel Dia.	Tape Width	A0	B0	K0	D	E	F	W	P0	P2	P	t
178mm (7")	8mm	1.08 ± 0.05	1.60 ± 0.05	0.72 ± 0.05	1.50 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ±0.30	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	0.20±0.025



ProTek Devices
2929 South Fair Lane, Tempe, AZ 85282
Tel: 602-431-8101 Fax: 602-431-2288
E-Mail: sales@protekdevices.com
Web Site: www.protekdevices.com