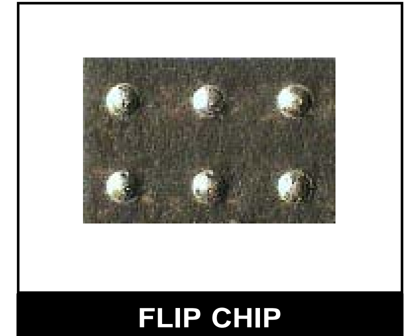
PROTEK DEVICES

CSP040605C

CHIP SCALE LOW CAPACITANCE FLIP CHIP TVSARRAY



FLIP CHIP

APPLICATIONS

- ✔ Cellular Phones
- ✔ Personal Digital Assistant (PDA)
- ✔ Notebook Computers
- ✔ SMART Cards

IEC COMPATIBILITY (EN61000-4)

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

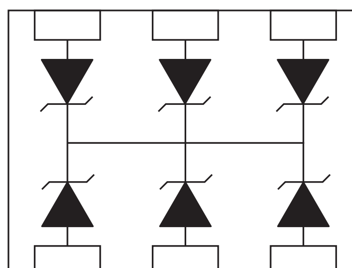
FEATURES

- ✔ ESD Protection > 25 kilovolts
- ✔ Available in 5V
- ✔ 200 Watts Peak Pulse Power per Line (tp = 8/20μs)
- ✔ Low Clamping Voltage
- ✔ Bidirectional Configuration & Monolithic Structure
- ✔ Protects 3 to 5 Lines
- ✔ Low Capacitance
- ✔ Low Leakage Current
- ✔ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ✔ Molded Chip Scale Package
- ✔ Low Profile - 0.254 mm Maximum Height
- ✔ Weight 0.73 milligrams (Approximate)
- ✔ Available in Lead-Free Plating
- ✔ Solder Reflow Temperature:
  Lead-Free - Sn/Ag/Cu, 96/3.5/0.5: 260-270°C
- ✔ Flammability Rating UL 94V-0
- ✔ 8mm Plastic & Paper Tape and Reel Per EIA Standard 481
- ✔ Device Marking On Reel
- ✔ No Under-Fill Required
- ✔ Prevents Solder Leakage and Solder Shorts

PIN CONFIGURATION



DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20μs) - See Figure 1	P_{PP}	200	Watts
Operating Temperature	T_A	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified						
PART NUMBER (See Note 1)	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
CSP040605C	5.9	6.0	11.0	13V @ 15A	10	35

Note 1: All devices are bidirectional. Electrical characteristics apply in both directions.
Note 2: Maximum leakage current <500nA @ 3.3V.

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

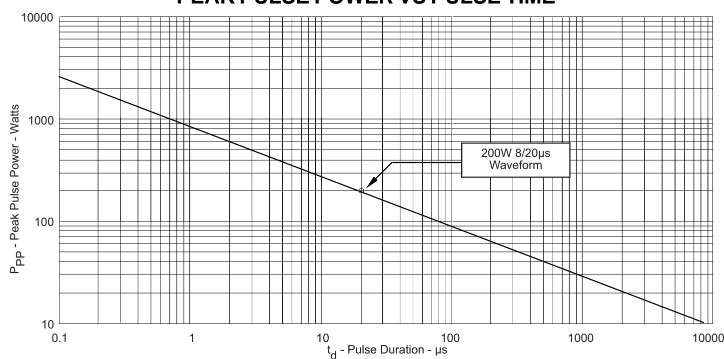
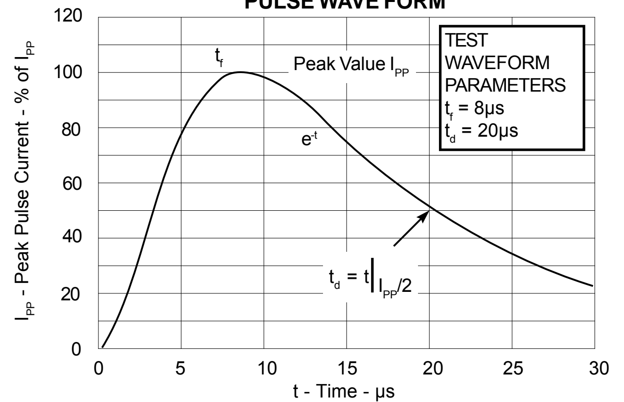


FIGURE 2
PULSE WAVE FORM



GRAPHS

FIGURE 3
POWER DERATING CURVE

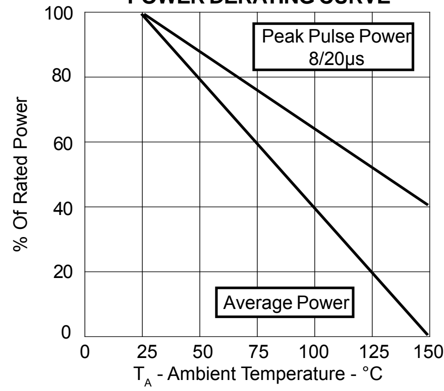


FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE

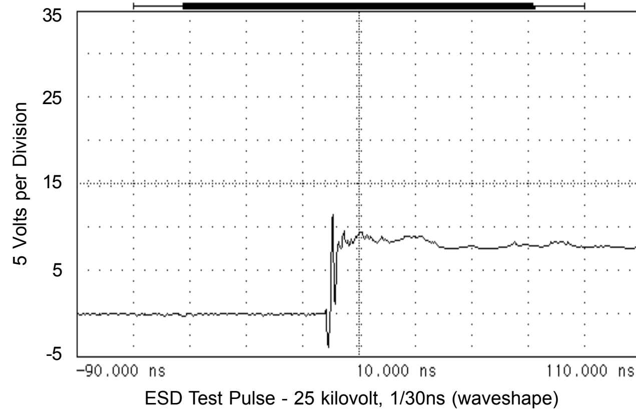
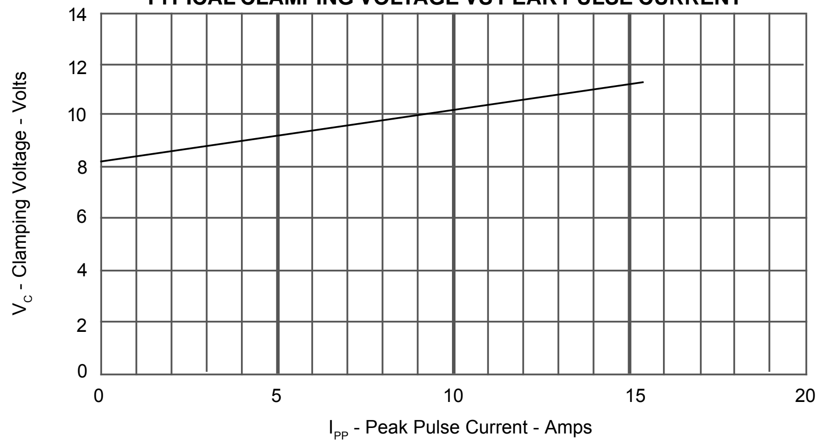


FIGURE 5
TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT

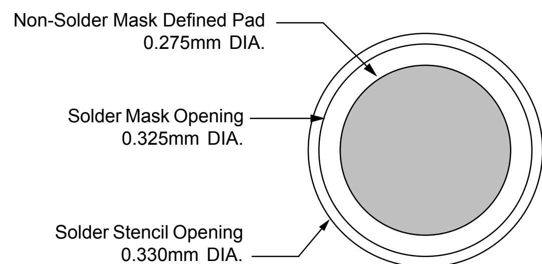


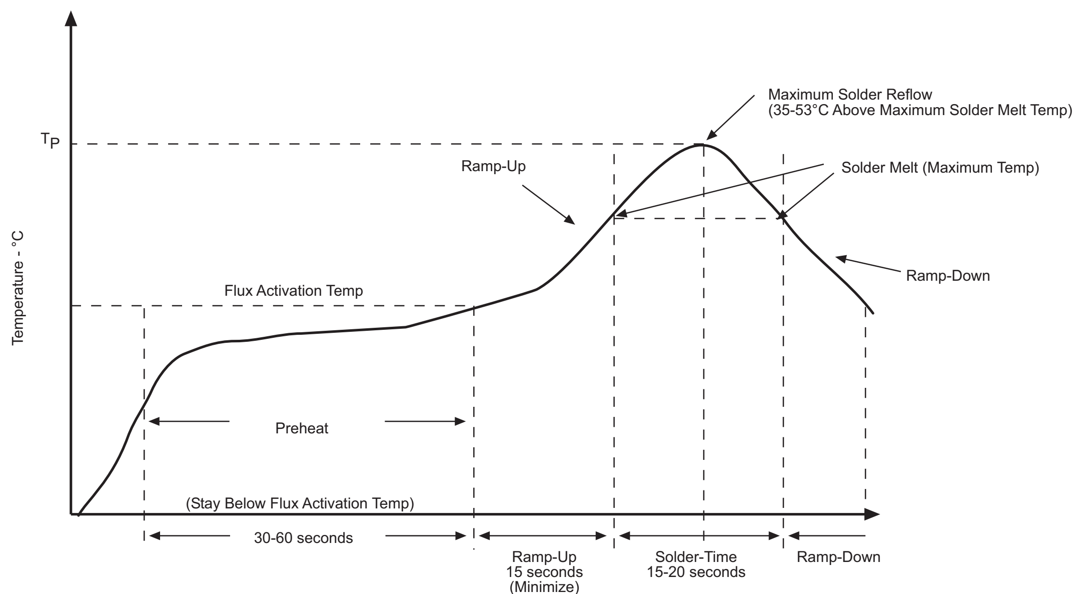
APPLICATION INFORMATION

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

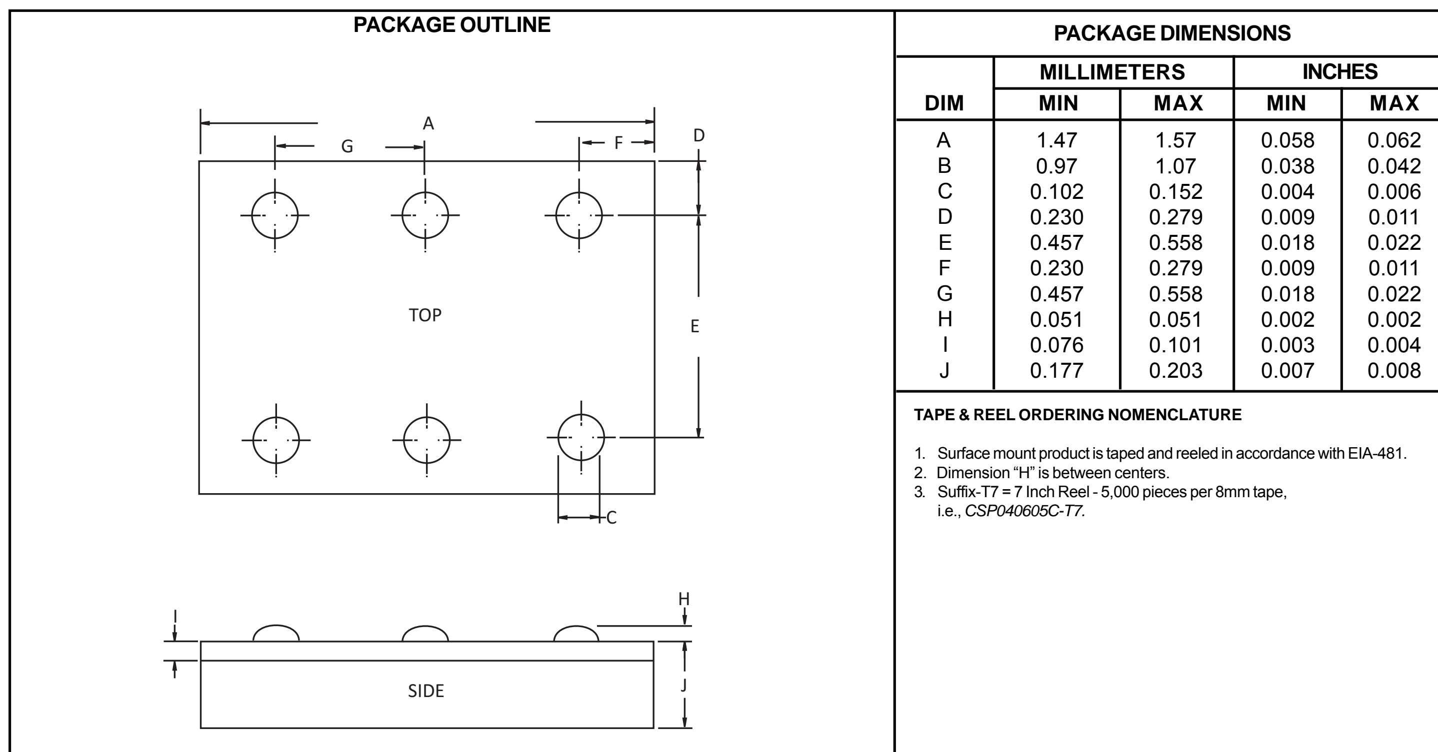
REQUIREMENTS
Temperature: T_P for Lead-Free (SnAgCu): 260-270°C T_P for Tin-Lead: 240-245°C Preheat time and temperature depends on solder paste and flux activation temperature, component size, weight, surface area & plating.

RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION

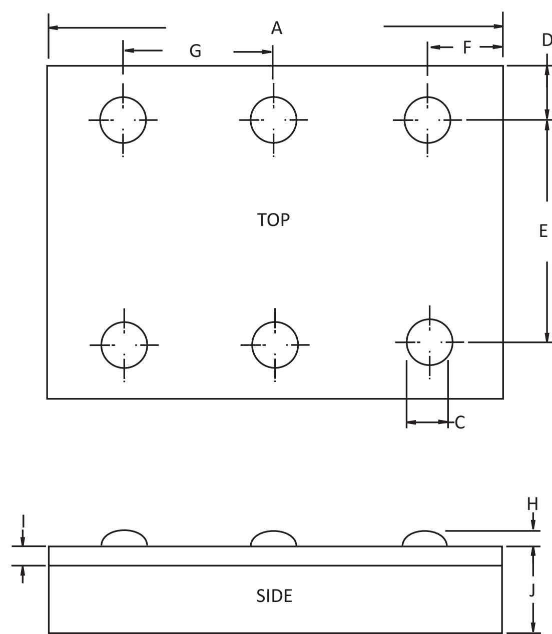




CHIP SCALE PACKAGE OUTLINE & DIMENSIONS



PACKAGE OUTLINE



PACKAGE DIMENSIONS

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	1.47	1.57	0.058	0.062
B	0.97	1.07	0.038	0.042
C	0.102	0.152	0.004	0.006
D	0.230	0.279	0.009	0.011
E	0.457	0.558	0.018	0.022
F	0.230	0.279	0.009	0.011
G	0.457	0.558	0.018	0.022
H	0.051	0.051	0.002	0.002
I	0.076	0.101	0.003	0.004
J	0.177	0.203	0.007	0.008

TAPE & REEL ORDERING NOMENCLATURE

1. Surface mount product is taped and reeled in accordance with EIA-481.
2. Dimension “H” is between centers.
3. Suffix-T7 = 7 Inch Reel - 5,000 pieces per 8mm tape, i.e., *CSP040605C-T7.*