200W CHIP SCALE TVS ARRAY

DESCRIPTION

The CSP040605C is a chip scale TVS array that employ advanced silicon P/N junction technology for unmatched board-level transient voltage protection against Electrostatic Discharge (ESD) and Electrical Fast Transients (EFT). Developed specifically for high-density circuit protection, this series meets the IEC 61000-4-2 and 61000-4-4 requirements. These devices are ideally suited for handheld devices such as SMART phones, PCMCIA and SMART cards.

This device provides ESD protection greater than 25 kilovolts with a peak pulse power dissipation of 200 Watts per line for an 8/20µs waveform. In addition, the CSP040605C features superior clamping performance, low leakage current characteristics and a response time of less than a nanosecond. Their low inductance virtually eliminates overshoot voltage due to package inductance.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air 15kV, Contact 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A, 5/50ns
- ESD Protection > 25 kilovolts
- Available in 5 Volts
- 200 Watts Peak Pulse Power per Line (tp = 8/20µs)
- Low Clamping Voltage
- Bidirectional Configuration & Monolithic Structure
- Low Leakage Current
- Low Capacitance
- Protection for 3 to 5 Lines
- Package Design Prevents Solder Leakage & Solder Shorts
- RoHS Compliant
- REACH Compliant

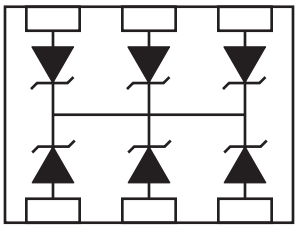
APPLICATIONS

- SMART Phones
- Portable Electronics
- SMART Cards

MECHANICAL CHARACTERISTICS

- Molded Chip Scale 0406 Package
- Low Profile - 0.254mm Maximum Height
- Approximate Weight: 0.73 milligrams
- Lead-Free Plating
- Solder Reflow Temperature:
- Lead-Free - Sn/Ag/Cu, 96/3.5/0.5: 260-270°C
- Flammability Rating UL 94V-0
- No Under-Fill Required
- 8mm Tape per EIA Standard 481

PIN CONFIGURATION



TYPICAL 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 (Note 1)	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ I_P = 1A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ 8/20µS V_C @ I_{PP}	MAXIMUM LEAKAGE CURRENT (Note 2) @V_{WM} I_D µA	TYPICAL CAPACITANCE @0V, 1MHz C pF
CSP040605C	5.9	6.0	11.0	13.0V @ 15.0A	10	35

NOTES
1. Device is bidirectional. Electrical characteristics apply in both directions.
2. Maximum leakage current < 500nA @ 3.3V.

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

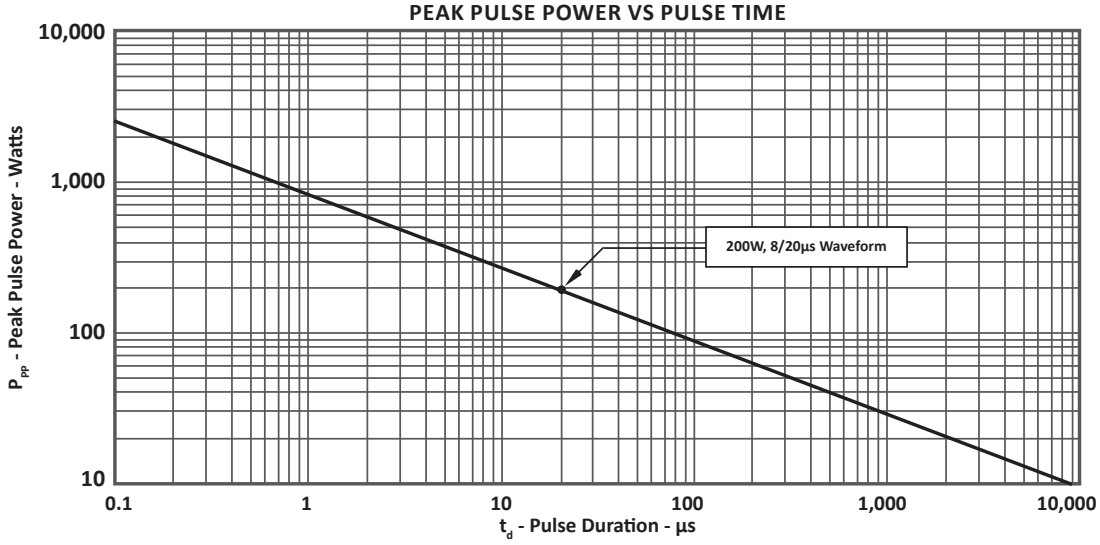


FIGURE 2
PULSE WAVE FORM

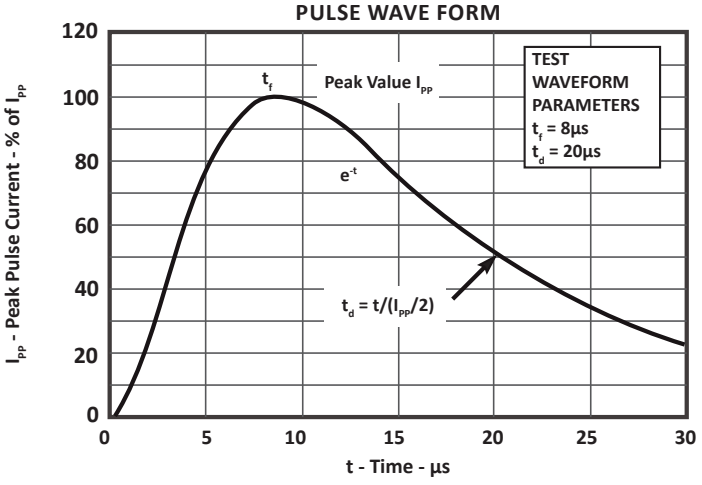
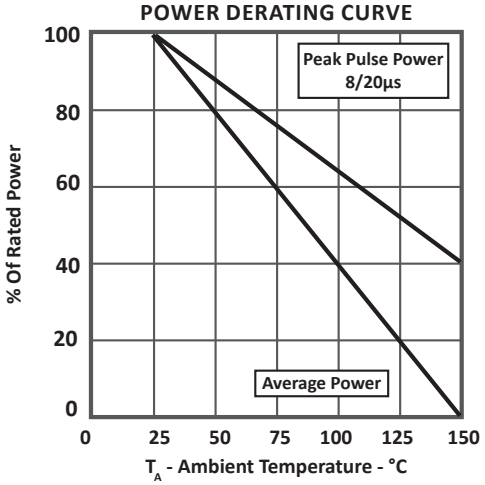
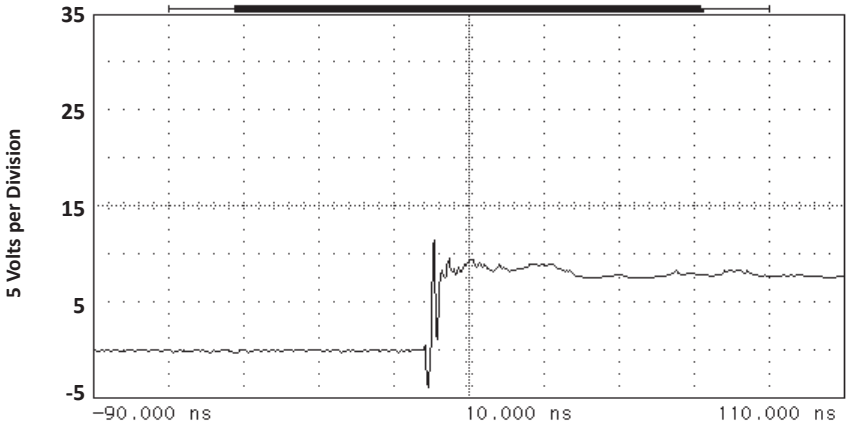


FIGURE 3
POWER DERATING CURVE



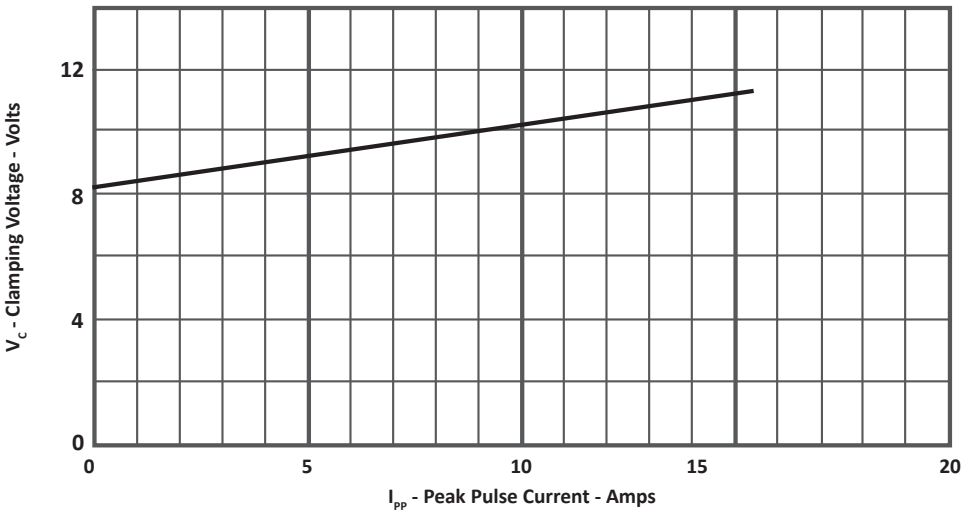
TYPICAL DEVICE CHARACTERISTICS

FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE



ESD Test Pulse - 25 kilovolt, 1/30ns (Waveshape)

FIGURE 5
TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT



SOLDER REFLOW 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

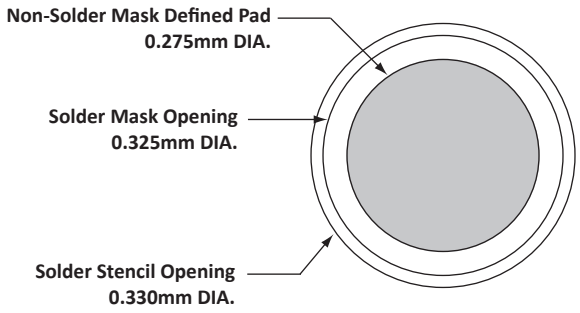
Temperature:

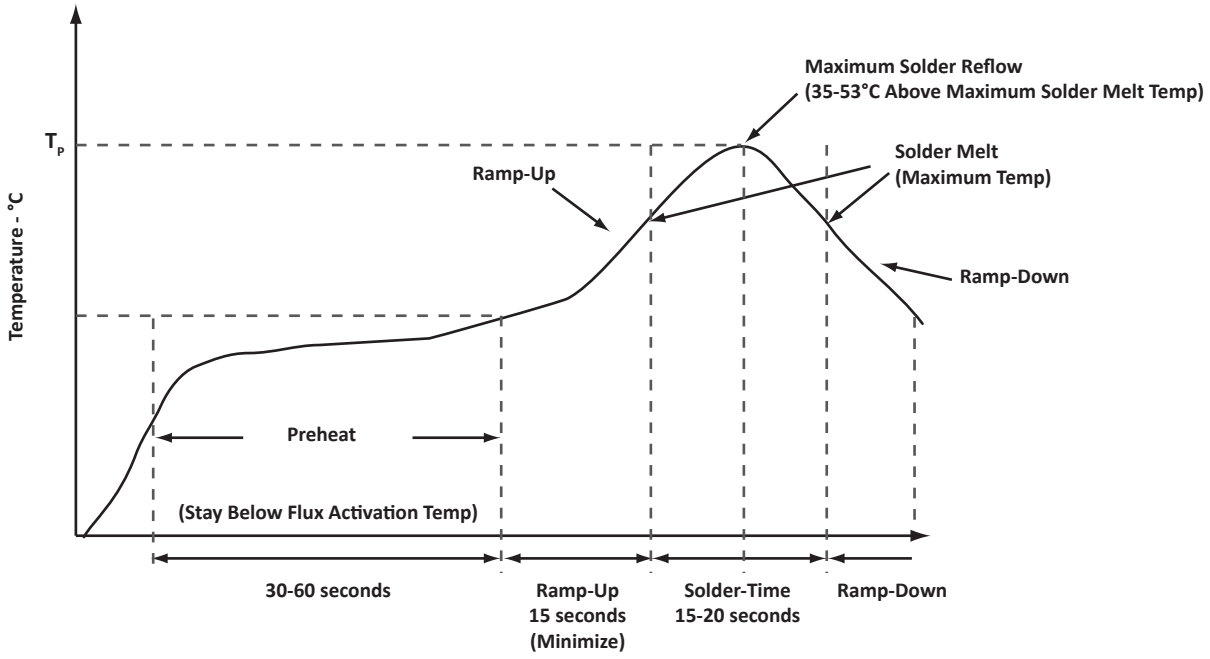
T_P for Lead-Free (Sn/Ag/Cu): 260-270°C

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 and plating.

RECOMMENDED NON-SOLDER MASK DEFINED PAD ILLUSTRATION

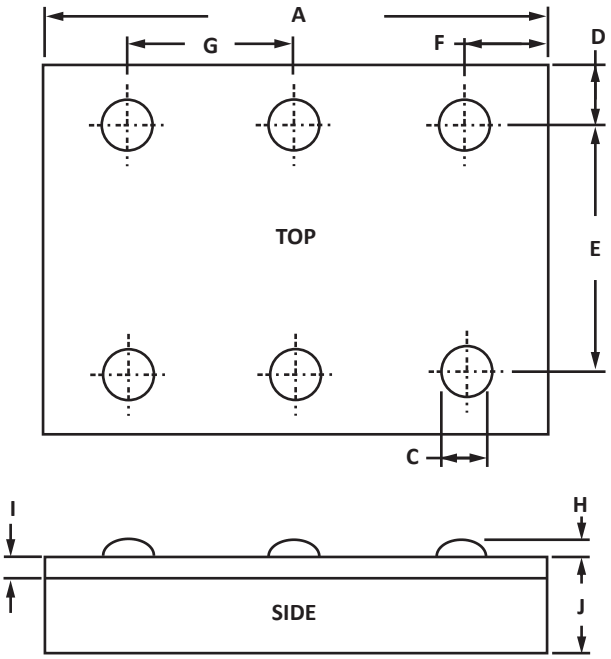




MOLDED CHIP SCALE 0406 PACKAGE INFORMATION

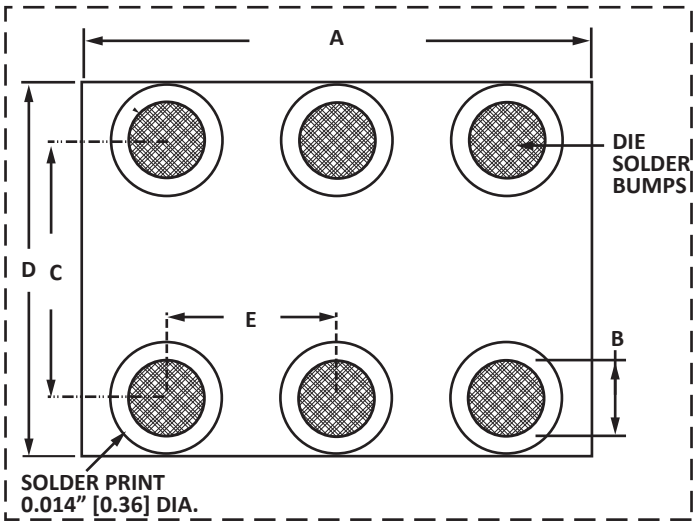
OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.47	1.57	0.058	0.062
B	0.97	1.07	0.038	0.042
C	0.102	0.152	0.004	0.006
D	0.230	0.279	0.009	0.011
E	0.457	0.558	0.018	0.022
F	0.230	0.279	0.009	0.011
G	0.457	0.558	0.018	0.022
H	0.051		0.002	
I	0.076	0.101	0.003	.004
J	0.177	0.203	0.007	0.008

NOTES
1. Controlling dimensions in inches.

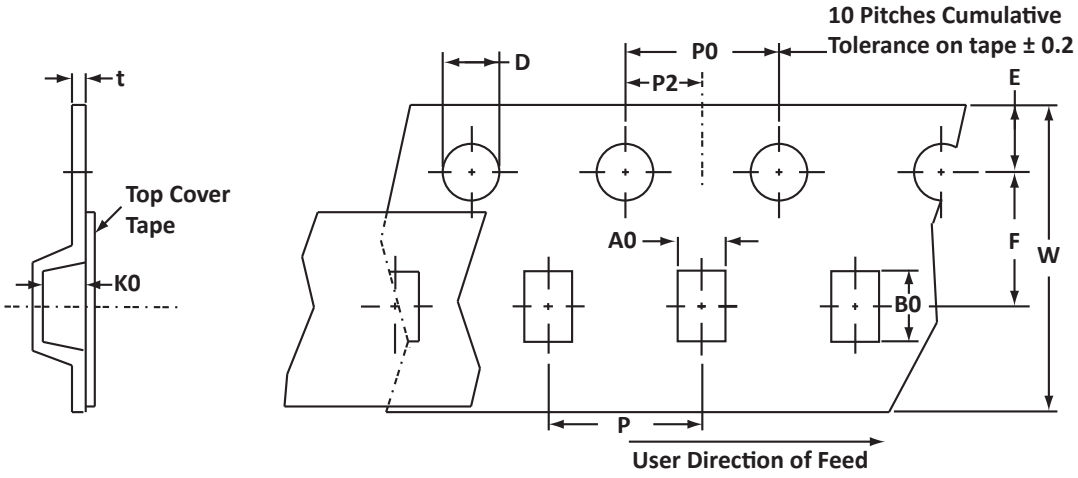


PAD LAYOUT DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.63	1.73	0.064	0.068
B	0.20	0.30	0.008	0.012
C	0.46	0.56	0.018	0.022
D	1.16	1.22	0.046	0.048
E	0.46	0.56	0.018	0.022
G	0.25	0.35	0.010	0.014

NOTES
1. Controlling dimension: inches.



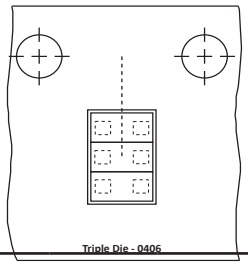
TAPE AND REEL INFORMATION



SPECIFICATIONS												
REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	Tmax
178(7")	8mm	1.40 ± 0.10	1.80 ± 0.10	0.32 ± 0.05	1.50 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.20	4.00 ± 0.12	2.00 ± 0.05	2.00 ± 0.10	0.25

NOTES
1. Dimensions in millimeters.
2. Top view of tape. Solder bumps are face down in tape package.
3. Orientation: preferred stencil - 0.1mm (0.004").
4. Surface mount product is taped and reeled in accordance with EIA 481.
5. 8mm plastic tape: 7" Reels - 5,000.
6. Marking on reel: part number, date code, quanity and lot number.

TAPE & REEL ORIENTATION



Package outline, pad layout and tape specifications per document number 06097.R0 3/11.

ORDERING INFORMATION					
BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
CSP040605C	n/a	-T75	5,000	7"	n/a

This device is only available in a Lead-Free configuration.

COMPANY INFORMATION

COMPANY PROFILE

ProTek Devices, based in Tempe, Arizona USA, is a manufacturer of Transient Voltage Suppression (TVS) products designed specifically for the protection of electronic systems from the effects of lightning, Electrostatic Discharge (ESD), Nuclear Electromagnetic Pulse (NEMP), inductive switching and EMI/RFI. With over 25 years of engineering and manufacturing experience, ProTek designs TVS devices that provide application specific protection solutions for all electronic equipment/systems.

ProTek Devices Analog Products Division, also manufactures analog interface, control, RF and power management products.

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