

**RoHS Q2L Series (C-Rated) SIDACtor® Device**

**Description**

The Q2L SIDACtor series provides bidirectional transient voltage protection in a low profile, chip scale package (CSP). The small package QFN (Quad Flatpak No-Lead) is ideal for dense board applications such as DSLAMs, T1/E1/J1 cards, and other telecommunication equipment.

**Features**

- RoHS compliant
- Chip Scale Package (CSP) sizing
- Wide range of  $I_{PP}$  ratings including:  
 500A for 2x10 $\mu$ s GR 1089 waveform  
 200A for 5x310/10x700 $\mu$ s ITU/YDT waveform  
 100A for 10x1000 $\mu$ s GR 1089 waveform  
 150A for 10x560 $\mu$ s TIA-968-A
- Bidirectional transient voltage protection
- Small footprint (QFN)
- Teccor brand SIDACtor technology

**Protection solution to meet**

- YD/T 950
- YD/T 993
- YD/T 1082
- GR 1089
- IEC 61000-4-5
- ITU K.20/21
- TIA-968-A

**Agency Approvals**

| AGENCY                                                                            | AGENCY FILE NUMBER |
|-----------------------------------------------------------------------------------|--------------------|
|  | E133083            |


**Electrical Characteristics**

| Part Number  | Marking | $V_{DRM}$<br>@ $I_{DRM}=5\mu A$ | $V_S$<br>@100V/ $\mu s$ | $I_H$ | $I_S$ | $I_T$ | $V_T$<br>@ $I_T=1$ amp | Capacitance<br>@1MHz, 2V bias |     |
|--------------|---------|---------------------------------|-------------------------|-------|-------|-------|------------------------|-------------------------------|-----|
|              |         | Volts                           | Volts                   | mAmps | mAmps | Amps  | Volts                  | pF                            |     |
|              |         | Min                             | Max                     | Min   |       |       | Max                    | Min                           | Max |
| P0080Q22CLRP | P-8C    | 6                               | 25                      | 50    | 800   | 2.2   | 5                      | 35                            | 75  |
| P0300Q22CLRP | P03C    | 25                              | 40                      | 50    | 800   | 2.2   | 5                      | 25                            | 45  |
| P0640Q22CLRP | P06C    | 58                              | 77                      | 150   | 800   | 2.2   | 5                      | 55                            | 85  |
| P0720Q22CLRP | P07C    | 65                              | 88                      | 150   | 800   | 2.2   | 5                      | 50                            | 75  |
| P0900Q22CLRP | P09C    | 75                              | 98                      | 150   | 800   | 2.2   | 5                      | 45                            | 70  |
| P1100Q22CLRP | P11C    | 90                              | 130                     | 150   | 800   | 2.2   | 5                      | 45                            | 70  |
| P1300Q22CLRP | P13C    | 120                             | 160                     | 150   | 800   | 2.2   | 5                      | 40                            | 60  |
| P1500Q22CLRP | P15C    | 140                             | 180                     | 150   | 800   | 2.2   | 5                      | 35                            | 55  |
| P1800Q22CLRP | P18C    | 170                             | 220                     | 150   | 800   | 2.2   | 5                      | 35                            | 50  |
| P2300Q22CLRP | P23C    | 190                             | 260                     | 150   | 800   | 2.2   | 5                      | 30                            | 50  |
| P2600Q22CLRP | P26C    | 220                             | 300                     | 150   | 800   | 2.2   | 5                      | 30                            | 45  |
| P3100Q22CLRP | P31C    | 275                             | 350                     | 150   | 800   | 2.2   | 5                      | 30                            | 45  |
| P3500Q22CLRP | P35C    | 320                             | 400                     | 150   | 800   | 2.2   | 5                      | 25                            | 40  |

- All measurements are made at an ambient temperature of 25°C.  $I_{PP}$  applies to -40°C through +85°C temperature range.
- $I_{PP}$  is a repetitive surge rating and is guaranteed for the life of the product.

- Listed SIDACtor devices are bidirectional. All electrical parameters and surge ratings apply to forward and reverse polarities.
- $V_S$  is measured at 100 V/ $\mu$ s.
- Off-state capacitance is measured at 1MHz with a 2 V bias.

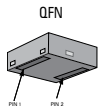
**Q2L (C-Rated) Series**

Specifications are subject to change without notice.

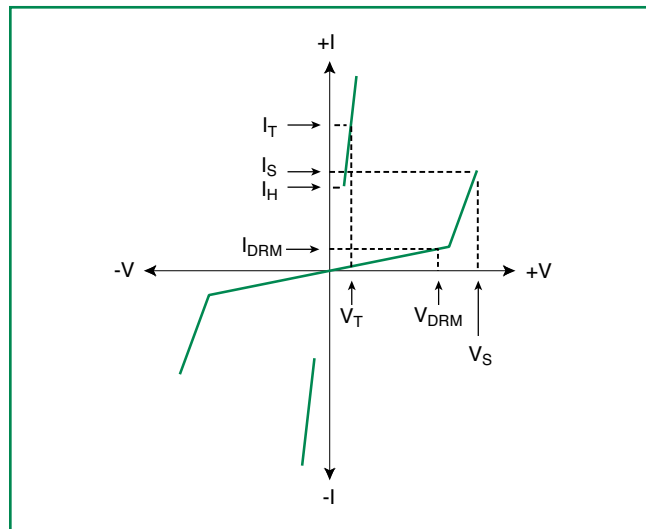
### Surge Ratings

| Series | $I_{pp}$     |                             |                |                |                 | di/dt         |
|--------|--------------|-----------------------------|----------------|----------------|-----------------|---------------|
|        | 2x10 $\mu$ s | 1.2x50 $\mu$ s/8x20 $\mu$ s | 10x160 $\mu$ s | 10x560 $\mu$ s | 10x1000 $\mu$ s | Amps/ $\mu$ s |
|        | Amps         | Amps                        | Amps           | Amps           | Amps            | Max           |
| C      | 500          | 400                         | 200            | 150            | 100             | 500           |

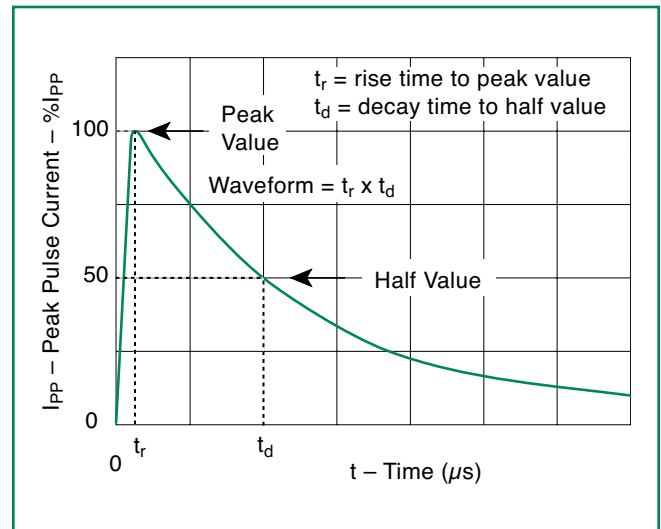
### Thermal Considerations

| Package                                                                           | Symbol          | Parameter                               | Value       | Unit |
|-----------------------------------------------------------------------------------|-----------------|-----------------------------------------|-------------|------|
|  | $T_J$           | Operating Junction Temperature Range    | -40 to +150 | °C   |
|                                                                                   | $T_S$           | Storage Temperature Range               | -65 to +150 | °C   |
|                                                                                   | $R_{\theta JA}$ | Thermal Resistance: Junction to Ambient | 120         | °C/W |

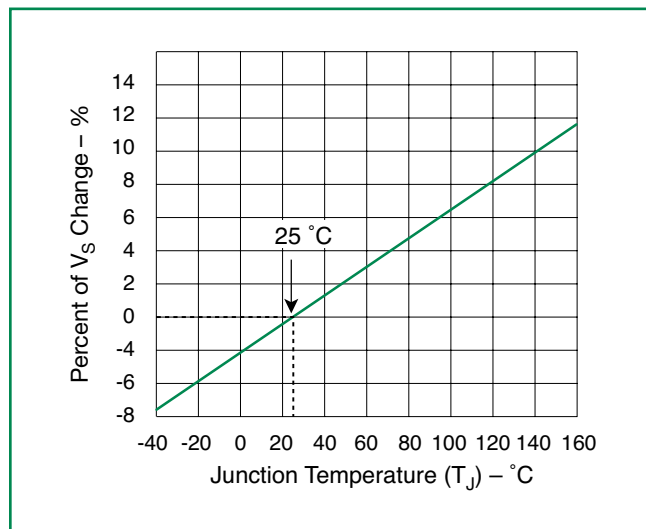
### V-I Characteristics



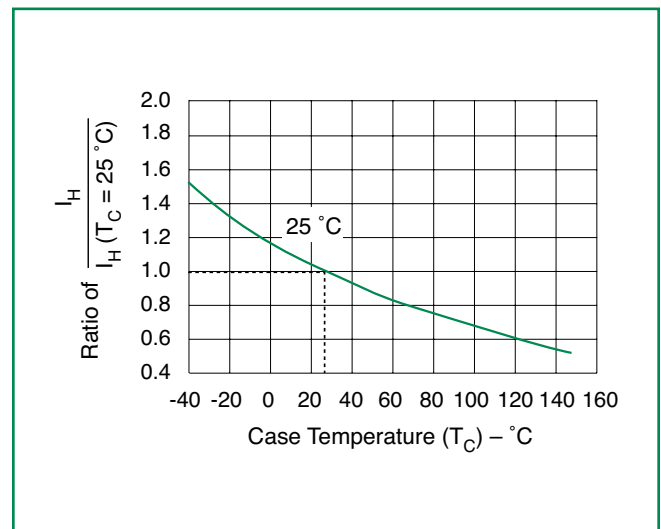
### $t_r \times t_d$ Pulse Waveform



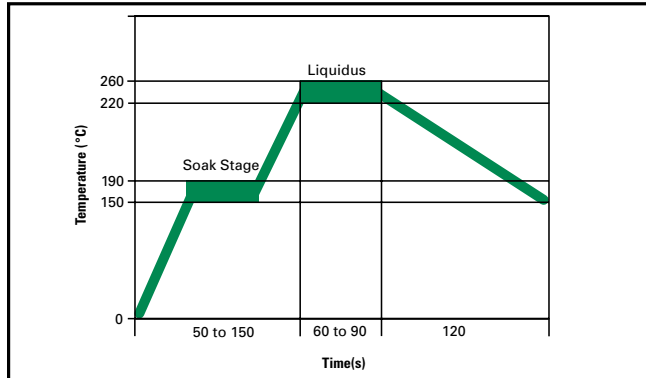
### Normalized $V_S$ Change Versus Junction Temperature



### Normalized DC Holding Current Versus Case Temperature



### Soldering Parameters



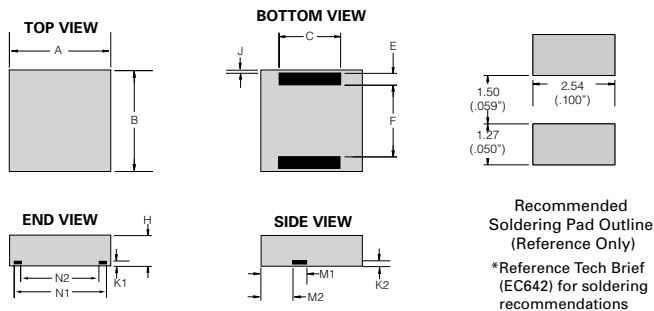
### Physical Specifications

|                           |                         |
|---------------------------|-------------------------|
| <b>Terminal Material</b>  | Matte Tin-plated Copper |
| <b>Lead Solderability</b> | ANSI/J-STD-002          |

### Environmental Specifications

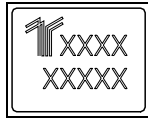
|                                      |                                                               |
|--------------------------------------|---------------------------------------------------------------|
| <b>Operating/Storage Temperature</b> | -40° C to ~ +150°C                                            |
| <b>Passive Aging</b>                 | 125° C, 1000 hours<br>Meet Spec                               |
| <b>Humidity Aging</b>                | +85°C, 85% R.H. 1000 hours<br>Meet Spec                       |
| <b>Thermal Shock</b>                 | MIL-STD-202 Method 107G<br>+85°C/-40°C 100 times<br>Meet spec |
| <b>Solvent Resistance</b>            | MIL-STD-202, Method 215<br>No Change                          |
| <b>Vibration</b>                     | MIL-STD-883C, Method 2007.1,<br>Condition A<br>No Change      |

### Dimensions



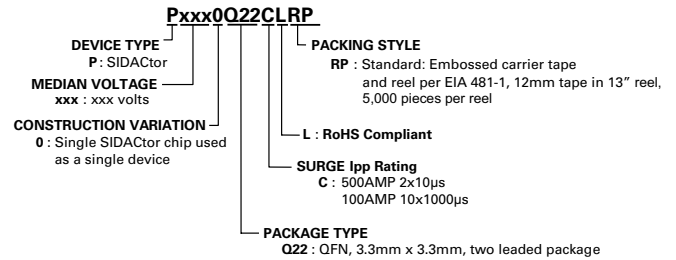
| Dimensions | Inches |       |       | Millimeters |       |       |
|------------|--------|-------|-------|-------------|-------|-------|
|            | Min    | Typ   | Max   | Min         | Typ   | Max   |
| A          | 0.126  | 0.130 | 0.134 | 3.200       | 3.300 | 3.400 |
| B          | 0.126  | 0.130 | 0.134 | 3.200       | 3.300 | 3.400 |
| C          | 0.075  | 0.079 | 0.083 | 1.900       | 2.000 | 2.100 |
| E          | 0.011  | 0.015 | 0.019 | 0.285       | 0.385 | 0.485 |
| F          | 0.088  | 0.092 | 0.096 | 2.230       | 2.330 | 2.430 |
| H          | 0.035  | 0.039 | 0.043 | 0.900       | 1.000 | 1.100 |
| J          | 0.000  | 0.004 | 0.008 | 0.000       | 0.100 | 0.200 |
| K1         | 0.004  | 0.008 | 0.012 | 0.100       | 0.200 | 0.300 |
| K2         | 0.004  | 0.008 | 0.012 | 0.100       | 0.200 | 0.300 |
| M1         | 0.063  | 0.067 | 0.071 | 1.610       | 1.710 | 1.810 |
| M2         | 0.045  | 0.049 | 0.053 | 1.153       | 1.253 | 1.353 |
| N1         | 0.095  | 0.099 | 0.103 | 2.420       | 2.520 | 2.620 |
| N2         | 0.082  | 0.086 | 0.090 | 2.080       | 2.180 | 2.280 |

### Part Marking System



First Line: Product Name (see marking in table)  
 Second Line: Lot number

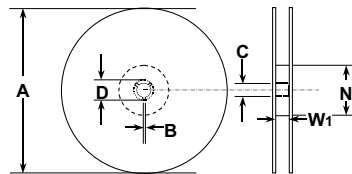
### Part Numbering System



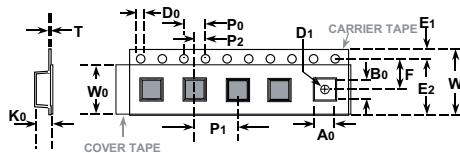
### Packaging

| Package Type | Description                | Packing Quantity | Added Suffix | Industry Standard |
|--------------|----------------------------|------------------|--------------|-------------------|
| QFN          | Embossed Carrier Reel Pack | 5000             | RP           | EIA-481-1         |

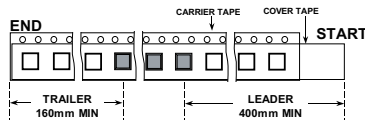
### Tape and Reel Specification



Reel Dimension



Tape Dimension Items



Tape Leader and Trailer Dimensions

| Symbols | Description                  | Inches  |         | Millimeters |         |
|---------|------------------------------|---------|---------|-------------|---------|
|         |                              | Minimum | Maximum | Minimum     | Maximum |
| A       | Reel Diameter                | N/A     | 12.992  | N/A         | 330.0   |
| B       | Drive Spoke Width            | 0.059   | N/A     | 1.50        | N/A     |
| C       | Arbor Hole Diameter          | 0.504   | 0.531   | 12.80       | 13.50   |
| D       | Drive Spoke Diameter         | 0.795   | N/A     | 20.20       | N/A     |
| N       | Hub Diameter                 | 1.969   | N/A     | 50.00       | N/A     |
| W1      | Reel Inner Width at Hub      | 0.488   | 0.567   | 12.40       | 14.40   |
| A0      | Pocket Width at bottom       | 0.138   | 0.146   | 3.50        | 3.70    |
| B0      | Pocket Length at bottom      | 0.138   | 0.146   | 3.50        | 3.70    |
| D0      | Feed Hole Diameter           | 0.059   | 0.063   | 1.50        | 1.60    |
| D1      | Pocket Hole Diameter         | 0.059   | N/A     | 1.50        | N/A     |
| E1      | Feed hole position 1         | 0.065   | 0.073   | 1.65        | 1.85    |
| E2      | Feed hole position 2         | 0.400   | 0.408   | 10.15       | 10.35   |
| F       | Feed hole center-Pocket hole | 0.215   | 0.219   | 5.45        | 5.55    |
| K0      | Pocket Depth                 | 0.039   | 0.051   | 1.00        | 1.30    |
| P0      | Feed Hole Pitch              | 0.153   | 0.161   | 3.90        | 4.10    |
| P1      | Component Spacing            | 0.311   | 0.319   | 7.90        | 8.10    |
| P2      | Feed hole center-Pocket hole | 0.077   | 0.081   | 1.95        | 2.05    |
| T       | Carrier Tape Thickness       | 0.010   | 0.014   | 0.25        | 0.35    |
| W       | Embossed Carrier Tape Width  | 0.453   | 0.484   | 11.50       | 12.30   |
| W0      | Cover Tape Width             | 0.358   | 0.366   | 9.10        | 9.30    |