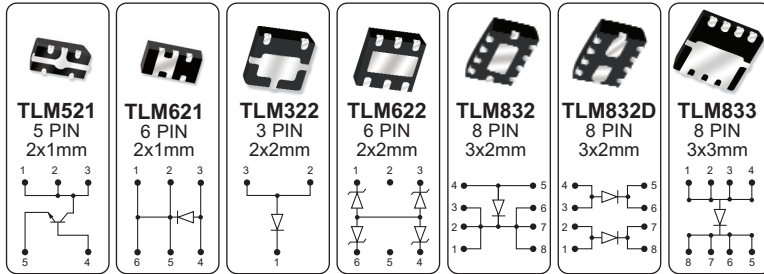


Tiny Leadless Modules™ (TLM™)



features

- Lower Profile than standard devices (under 1.0mm)
- Uses less board space than SMA, SMB and SMC devices
- Improved thermal efficiency and power capability
- All devices are Pb-Free and RoHS Compliant



Sample Devices
available
upon request.

description

Introducing the new Central Semiconductor Tiny Leadless Module™ or TLM™. The TLM™ case is a surface mount leadless package with a sub 1.0mm profile and provides improved thermal and power capability. This first series of TLM devices are listed below. Additional devices are under development.

selection guide



TLM Schottky Rectifiers

| TYPE NO. | V _{RRM} (V) MAX | I _F (A) MAX | V _F (V) MAX | @ I _F (A) | t _{rr} (ns) TYP. | C _D (pF) MAX | P _D (W) MAX | CASE TYPE |
|-----------------|--------------------------------|------------------------------|------------------------------|-------------------------|---------------------------------|-------------------------------|------------------------------|--------------|
| *CTLSH05-40M621 | 40 | 0.5 | 0.47 | 0.5 | – | 50 | 0.9† | TLM621 |
| CTLSH1-40M322 | 40 | 1.0 | 0.55 | 1.0 | 15 | 30 | 1.45† | TLM322 |
| CTLSH1-40M832D | 40 | Dual 1.0 per diode | 0.55 | 1.0 | 15 | 30 | 1.65† | TLM832D |
| CTLSH2-40M832 | 40 | 2.0 | 0.50 | 2.0 | – | 80 | 1.9† | TLM832 |
| CTLSH3-30M833 | 30 | 3.0 | 0.45 | 3.0 | – | TBD | 2.5† | TLM833 |
| *CTLSH5-40M833 | 40 | 5.0 | 0.52 | 5.0 | – | TBD | 2.5† | TLM833 |

TLM Low V_{CE(SAT)} Transistors

| TYPE NO. | BV _{CBO} (V) MAX | BV _{CEO} (V) MAX | BV _{EBO} (V) MAX | I _{CBO} @ V _{CB} | | h _{FE} | | @ V _{CE} | | @ I _C | V _{CE(SAT)} @ I _C | C _{ob} (pF) MAX | f _T (MHz) MIN | P _D (W) MAX | CASE TYPE | |
|---------------|---------------------------------|---------------------------------|---------------------------------|------------------------------------|-----|-----------------|-----|-------------------|------|------------------|---------------------------------------|--------------------------------|--------------------------------|------------------------------|--------------|--------|
| | | | | (nA) MAX | (V) | MIN | MAX | (V) | (mA) | (V) MAX | (A) | | | | | |
| NPN | | | | | | | | | | | | | | | | |
| CTLT3410-M521 | 40 | 25 | 6.0 | 100 | 40 | 100 | 300 | 1.0 | 100 | 100 | 0.45 | 1.0 | 10 | 100 | 0.9† | TLM521 |
| PNP | | | | | | | | | | | | | | | | |
| CTLT7410-M521 | 40 | 25 | 6.0 | 100 | 40 | 100 | 300 | 1.0 | 100 | 100 | 0.45 | 1.0 | 15 | 100 | 0.9† | TLM521 |

TLM TVS/Zener Array

| | | |
|-------------------------|----------------------|--------|
| *CTLSMS05 thru CTLSMS24 | Quad TVS Zener Array | TLM622 |
|-------------------------|----------------------|--------|

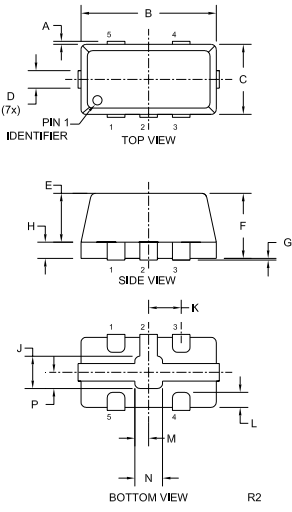
* In Development

† Mounted on FR-4 Epoxy PC board with copper mounting pad.

Tiny Leadless Modules™ (TLM™)

Mechanical Specifications

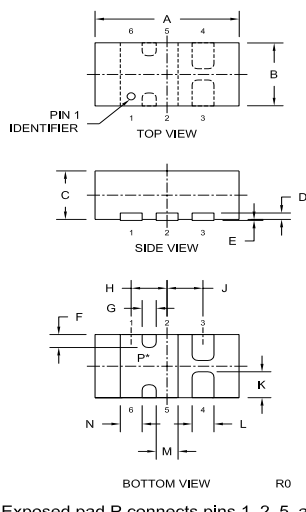
TLM521, 5 PIN, 2x1mm



| SYMBOL | INCHES | | MILLIMETERS | |
|--------|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | — | 0.005 | — | 0.125 |
| F | 0.0075 | 0.083 | 0.190 | 2.100 |
| C | 0.005 | 0.045 | 0.127 | 1.143 |
| D | 0.007 | 0.012 | 0.178 | 0.305 |
| E | 0.006 | 0.030 | 0.152 | 0.750 |
| F | 0.031 | 0.039 | 0.800 | 1.000 |
| G | 0.000 | 0.002 | 0.000 | 0.050 |
| H | 0.006 | 0.010 | 0.152 | 0.254 |
| J | 0.013 | 0.021 | 0.330 | 0.530 |
| K | 0.020 | — | 0.500 | — |
| L | 0.004 | 0.014 | 0.100 | 0.350 |
| M | 0.002 | 0.010 | 0.050 | 0.250 |
| N | 0.009 | 0.017 | 0.229 | 0.420 |
| P | 0.005 | 0.013 | 0.127 | 0.320 |

TLM521 (REV: R2)

TLM621, 6 PIN, 2x1mm

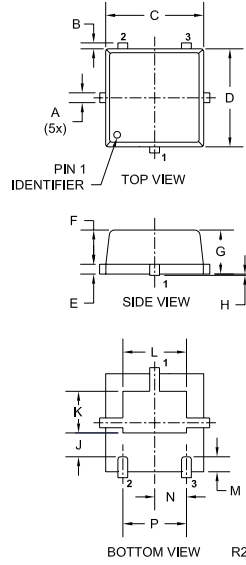


| SYMBOL | INCHES | | MILLIMETERS | |
|--------|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.073 | 0.085 | 1.850 | 2.150 |
| B | 0.033 | 0.045 | 0.850 | 1.150 |
| C | 0.026 | 0.030 | 0.650 | 0.750 |
| D | — | 0.006 | — | 0.150 |
| E | 0.000 | 0.002 | 0.000 | 0.050 |
| F | 0.008 | — | 0.200 | — |
| G | 0.010 | — | 0.250 | — |
| H | 0.020 | — | 0.500 | — |
| J | 0.020 | — | 0.500 | — |
| K | 0.012 | 0.020 | 0.300 | 0.500 |
| L | 0.008 | 0.012 | 0.200 | 0.300 |
| M | 0.008 | 0.012 | 0.200 | 0.300 |
| N | 0.008 | 0.012 | 0.200 | 0.300 |

TLM621 (REV: R0)

* Exposed pad P connects pins 1, 2, 5, and 6

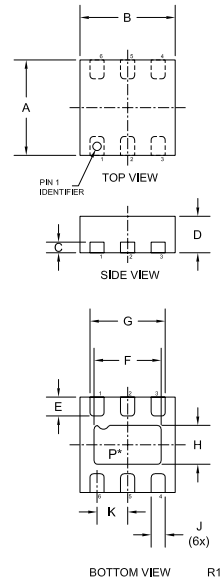
TLM322, 3 PIN, 2x2mm



| SYMBOL | INCHES | | MILLIMETERS | |
|--------|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.007 | 0.012 | 0.17 | 0.30 |
| B | — | 0.005 | — | 0.125 |
| C | 0.075 | 0.083 | 1.90 | 2.10 |
| D | 0.075 | 0.083 | 1.90 | 2.10 |
| E | 0.008 | 0.010 | 0.15 | 0.25 |
| F | 0.026 | 0.030 | 0.65 | 0.75 |
| G | 0.031 | 0.039 | 0.80 | 1.00 |
| H | 0.000 | 0.002 | 0.00 | 0.05 |
| J | 0.024 | — | 0.60 | — |
| K | 0.031 | 0.035 | 0.79 | 0.89 |
| L | 0.048 | 0.056 | 1.22 | 1.42 |
| M | 0.008 | 0.018 | 0.20 | 0.45 |
| N | 0.026 | — | 0.65 | — |
| P | 0.051 | — | 1.30 | — |

TLM322 (REV: R2)

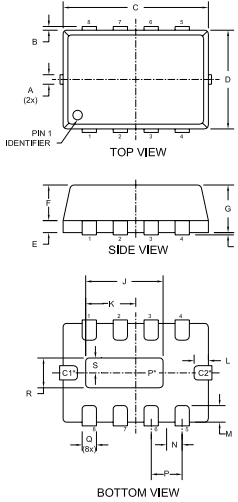
TLM622, 6 PIN, 2x2mm



| SYMBOL | INCHES | | MILLIMETERS | |
|--------|--------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.077 | 0.081 | 1.95 | 2.05 |
| B | 0.077 | 0.081 | 1.95 | 2.05 |
| C | 0.007 | 0.009 | 0.18 | 0.23 |
| D | 0.029 | 0.031 | 0.73 | 0.78 |
| E | 0.012 | 0.016 | 0.30 | 0.40 |
| F | 0.053 | 0.057 | 1.35 | 1.45 |
| G | 0.061 | — | 1.55 | — |
| H | 0.030 | 0.033 | 0.75 | 0.85 |
| J | 0.008 | 0.012 | 0.20 | 0.30 |
| K | 0.026 | — | 0.65 | — |

TLM622 (REV: R1)

* See lead code for internal connections to exposed pad P

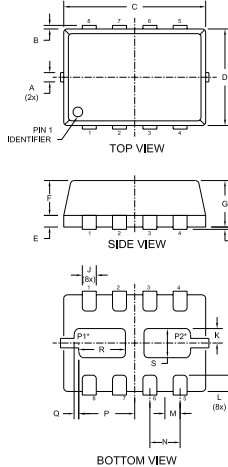


**TLM832
8 PIN
3x2mm**

| SYMBOL | INCHES | | MILLIMETERS | |
|--------|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.007 | 0.012 | 0.178 | 0.300 |
| B | — | 0.005 | — | 0.125 |
| C | 0.114 | 0.122 | 2.900 | 3.100 |
| D | 0.075 | 0.083 | 1.900 | 2.100 |
| E | 0.006 | 0.010 | 0.150 | 0.250 |
| F | 0.026 | 0.030 | 0.650 | 0.750 |
| G | 0.031 | 0.039 | 0.800 | 1.000 |
| H | 0.000 | 0.002 | 0.000 | 0.050 |
| J | 0.059 | 0.067 | 1.500 | 1.700 |
| K | 0.026 | 0.044 | 0.650 | 1.100 |
| L | 0.008 | 0.018 | 0.200 | 0.450 |
| M | 0.008 | 0.019 | 0.200 | 0.450 |
| N | 0.013 | — | 0.325 | — |
| P | 0.026 | — | 0.650 | — |
| Q | 0.005 | 0.013 | 0.125 | 0.320 |
| R | 0.011 | 0.024 | 0.275 | 0.600 |
| S | 0.005 | 0.014 | 0.125 | 0.360 |

TLM832 (REV: R2)

* Note:
 - Exposed pad P Internally connected to pins 1, 2, 3, 6, 7, 8
 - Exposed metalized connection C1 Internally connected to pins 1, 2, 3, 6, 7, 8
 - Exposed metalized connection C2 Internally connected to pin 5

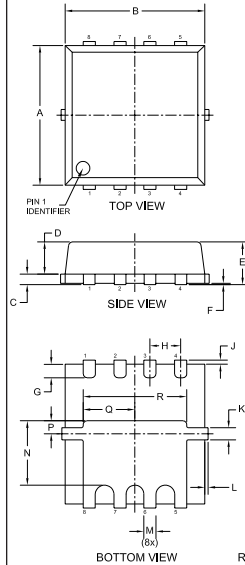


**TLM832D
8 PIN
3x2mm**

| SYMBOL | INCHES | | MILLIMETERS | |
|--------|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.007 | 0.012 | 0.178 | 0.300 |
| B | — | 0.005 | — | 0.125 |
| C | 0.114 | 0.122 | 2.900 | 3.100 |
| D | 0.075 | 0.083 | 1.900 | 2.100 |
| E | 0.006 | 0.010 | 0.150 | 0.250 |
| F | 0.026 | 0.030 | 0.650 | 0.750 |
| G | 0.031 | 0.039 | 0.800 | 1.000 |
| H | 0.000 | 0.002 | 0.000 | 0.050 |
| J | 0.059 | 0.063 | 1.240 | 1.340 |
| K | 0.008 | 0.014 | 0.180 | 0.360 |
| L | 0.008 | 0.016 | 0.200 | 0.400 |
| M | 0.013 | — | 0.325 | — |
| N | 0.008 | — | 0.200 | — |
| P | 0.048 | 0.048 | 1.010 | 1.210 |
| Q | 0.004 | — | 0.100 | — |
| R | 0.022 | 0.040 | 0.620 | 1.020 |
| S | 0.017 | 0.025 | 0.430 | 0.630 |

TLM832D (REV: R2)

* Note:
 - Exposed pad P1 common to pins 7 and 8
 - Exposed pad P2 common to pins 5 and 6



**TLM833
8 PIN
3x3mm**

| SYMBOL | INCHES | | MILLIMETERS | |
|--------|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.114 | 0.122 | 2.90 | 3.10 |
| B | 0.114 | 0.122 | 2.90 | 3.10 |
| C | 0.006 | 0.010 | 0.15 | 0.25 |
| D | 0.026 | 0.030 | 0.65 | 0.75 |
| E | 0.031 | 0.039 | 0.80 | 1.00 |
| F | 0.000 | 0.002 | 0.00 | 0.05 |
| G | 0.008 | 0.018 | 0.20 | 0.45 |
| H | — | 0.026 | — | 0.65 |
| J | — | 0.005 | — | 0.125 |
| K | 0.007 | 0.012 | 0.17 | 0.30 |
| L | — | 0.005 | — | 0.125 |
| M | 0.011 | 0.015 | 0.28 | 0.38 |
| N | 0.049 | 0.057 | 1.25 | 1.45 |
| P | 0.005 | 0.014 | 0.15 | 0.35 |
| Q | 0.040 | 0.048 | 1.01 | 1.21 |
| R | 0.085 | 0.093 | 2.16 | 2.36 |

TLM833 (REV: R2)

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