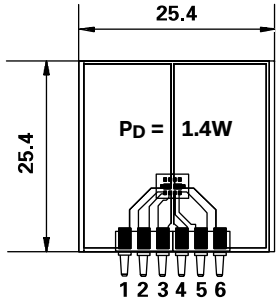
# ZX3CD**M832EV
# ZXM*S**M832EV

## MPPS™ Miniature Package Power Solutions
## COMBINATION DUAL DIE MLP EVALUATION BOARD THERMAL SPECIFICATION SHEET

**EVALUATION BOARD DIAGRAM**

**RECOMMENDED FOOTPRINT 3mm x 2mm MLP**
(underside view)

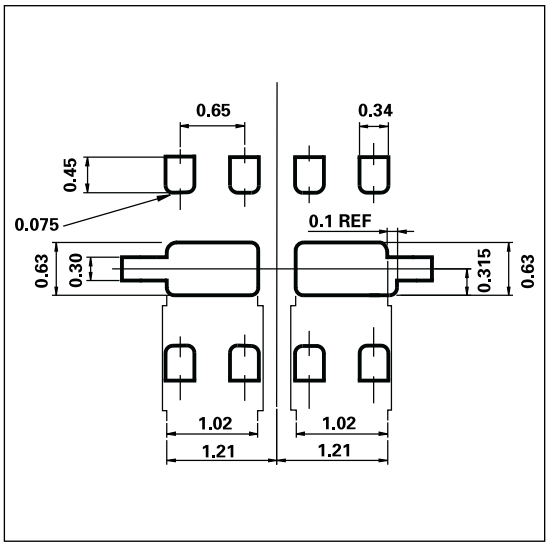



| DEVICE | PIN CONNECTIONS | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Bipolar Transistor (NPN or PNP) & Schottky Diode | C | B | E | N/C | A | K |
| MOSFET (N or P Channel) & Schottky Diode | D | S | G | N/C | A | K |

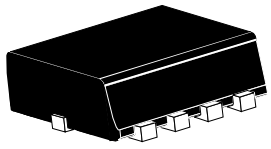
Note:
Designers needing to evaluate electrical performance using the thermal evaluation boards must be aware that the device(s) pass the the datasheet limits but the resistance paths of the PCB contribute significant series resistance.

This should be taken into account when measuring higher current $V_{CE(sat)}$, $V_{BE(sat)}$ and $V_{BE(on)}$ parameters.

**SHORTFORM TABLES** (see page 4)




all dimensions are in max millimetres



3mm x 2mm (Dual die) MLP

## $P_D$ & THERMAL DATA (TRANSISTOR)

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|---|---|---|
| **Power Dissipation at TA=25°C** | | | |
| Power Dissipation at TA=25°C (a)(f)<br>Linear Derating Factor | $P_D$ | 1.5<br>12 | W<br>mW/°C |
| Power Dissipation at TA=25°C (b)(f)<br>Linear Derating Factor | $P_D$ | 2.45<br>19.6 | W<br>mW/°C |
| Power Dissipation at TA=25°C (c)(f)<br>Linear Derating Factor | $P_D$ | 1<br>8 | W<br>mW/°C |
| Power Dissipation at TA=25°C (d)(f)<br>Linear Derating Factor | $P_D$ | 1.13<br>9 | W<br>mW/°C |
| Power Dissipation at TA=25°C (d)(g)<br>Linear Derating Factor | $P_D$ | 1.7<br>13.6 | W<br>mW/°C |
| Power Dissipation at TA=25°C (e)(g)<br>Linear Derating Factor | $P_D$ | 3<br>24 | W<br>mW/°C |
| Operating and Storage Temperature Range | $T_j$:$T_{stg}$ | -55 to +150 | °C |
| **THERMAL RESISTANCE** | | | |
| Junction to Ambient (a)(f) | $R_{\theta JA}$ | 83.3 | °C/W |
| Junction to Ambient (b)(f) | $R_{\theta JA}$ | 51 | °C/W |
| Junction to Ambient (c)(f) | $R_{\theta JA}$ | 125 | °C/W |
| Junction to Ambient (d)(f) | $R_{\theta JA}$ | 111 | °C/W |
| Junction to Ambient (d)(g) | $R_{\theta JA}$ | 73.5 | °C/W |
| Junction to Ambient (e)(g) | $R_{\theta JA}$ | 41.7 | °C/W |

Notes

(a) For a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(b) Measured at t<5 secs for a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached.** The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(c) For a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with minimal lead connections only.**

(d) For a dual device surface mounted on 10 sq cm single sided 1oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(e) For a dual device surface mounted on 85 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(f) For a dual device with one active die.

(g) For dual device with 2 active die running at equal power.

(i) The minimum copper dimensions required for mounting are no smaller than the exposed metal pads on the base of the device as shown in the package dimensions data. The thermal resistance for a dual device mounted on 1.5mm thick FR4 board using minimum copper 1 oz weight, 1mm wide tracks and one half of the device active is Rth = 250°C/W giving a power rating of Ptot = 500mW.

## $P_D$ & THERMAL DATA (SCHOTTKY DIODE)

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| **Schottky Diode** | | | |
| Power Dissipation at TA=25°C (a)(f)<br>Linear Derating Factor | $P_D$ | 1.2<br>12 | W<br>mW/°C |
| Power Dissipation at TA=25°C (b)(f)<br>Linear Derating Factor | $P_D$ | 2<br>20 | W<br>mW/°C |
| Power Dissipation at TA=25°C (c)(f)<br>Linear Derating Factor | $P_D$ | 0.8<br>8 | W<br>mW/°C |
| Power Dissipation at TA=25°C (d)(f)<br>Linear Derating Factor | $P_D$ | 0.9<br>9 | W<br>mW/°C |
| Power Dissipation at TA=25°C (d)(g)<br>Linear Derating Factor | $P_D$ | 1.36<br>13.6 | W<br>mW/°C |
| Power Dissipation at TA=25°C (e)(g)<br>Linear Derating Factor | $P_D$ | 2.4<br>24 | W<br>mW/°C |
| Storage Temperature Range | $T_{stg}$ | -55 to +150 | °C |
| Junction Temperature | $T_j$ | 125 | °C |
| **THERMAL RESISTANCE** | | | |
| Junction to Ambient (a)(f) | $R_{\theta JA}$ | 83 | °C/W |
| Junction to Ambient (b)(f) | $R_{\theta JA}$ | 51 | °C/W |
| Junction to Ambient (c)(f) | $R_{\theta JA}$ | 125 | °C/W |
| Junction to Ambient (d)(f) | $R_{\theta JA}$ | 111 | °C/W |
| Junction to Ambient (d)(g) | $R_{\theta JA}$ | 73.5 | °C/W |
| Junction to Ambient (e)(g) | $R_{\theta JA}$ | 41.7 | °C/W |

Notes

(a) For a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(b) Measured at t<5 secs for a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached.** The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(c) For a dual device surface mounted on 8 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with minimal lead connections only.**

(d) For a dual device surface mounted on 10 sq cm single sided 1oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(e) For a dual device surface mounted on 85 sq cm single sided 2oz copper on FR4 PCB, in still air conditions **with all exposed pads attached**. The copper area is split down the centre line into two separate areas with one half connected to each half of the dual device.

(f) For a dual device with one active die.

(g) For dual device with 2 active die running at equal power.

(i) The minimum copper dimensions required for mounting are no smaller than the exposed metal pads on the base of the device as shown in the package dimensions data. The thermal resistance for a dual device mounted on 1.5mm thick FR4 board using minimum copper 1 oz weight, 1mm wide tracks and one half of the device active is Rth = 250°C/W giving a power rating of Ptot = 400mW.

# ZX3CD**M832EV
# ZXM*S**M832EV

**SHORTFORM TABLE** (Transistor / SCHOTTKY combinations)

| Device Type | Part code | Polarity | $V_{CEO}$/ $V_R$ V | $I_C$/ $I_F$ A | Device Type | Part code | Polarity | $V_{CEO}$/ $V_R$ V | $I_C$/ $I_F$ A |
|---|---|---|---|---|---|---|---|---|---|
| #ZX3CDBS1M832EV | BS1 | NPN | 20 | 4.5 | #ZX3CD2S1M832EV | 2S1 | PNP | -20 | -3.5 |
| | | Diode | 40 | 1.85 | | | Diode | 40 | 1.85 |
| #ZX3CD1S1M832EV | 1S1 | PNP | -12 | -4 | #ZX3CD3S1M832EV | 3S1 | PNP | -40 | -3 |
| | | Diode | 40 | 1.85 | | | Diode | 40 | 1.85 |

**SHORTFORM TABLE** (MOSFET / SCHOTTKY combinations)

| Device Type | Part code | Polarity | $BV_{DSS}$/ $V_R$ V | $I_D$/ $I_C$ A |
|---|---|---|---|---|
| #ZXMNS3BM832EV | MSA | N-Channel | 30 | 2.0 |
| | | Diode | 40 | 1.85 |
| #ZXMPS62M832EV | MSB | P-Channel | -20 | -1.3 |
| | | Diode | 40 | 1.85 |

# Prefix is an internal ordering requirement only.

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