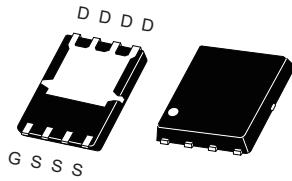


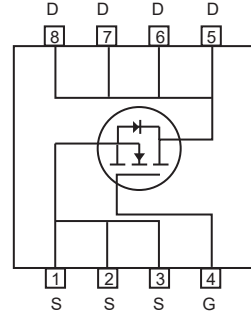
## N-Channel Enhancement Mode Field Effect Transistor

### FEATURES

- 100V, 31A,  $R_{DS(ON)} = 16m\Omega$  @ $V_{GS} = 10V$ .  
 $R_{DS(ON)} = 24m\Omega$  @ $V_{GS} = 4.5V$ .
- Super high dense cell design for extremely low  $R_{DS(ON)}$ .
- High power and current handling capability.
- RoHS compliant.
- Surface mount Package.



P-PAK 5X6



### ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ C$ unless otherwise noted

| Parameter                                    | Symbol                   | Limit      | Units      |
|--|--------------------------|------------|------------|
| Drain-Source Voltage                         | $V_{DS}$                 | 100        | V          |
| Gate-Source Voltage                          | $V_{GS}$                 | $\pm 20$   | V          |
| Drain Current-Continuous                     | $I_D @ R_{\theta JA}$    | 14.7       | A          |
| Drain Current-Continuous                     | $I_D @ R_{\theta JC}$    | 31         | A          |
| Drain Current-Pulsed <sup>a</sup>            | $I_{DM} @ R_{\theta JA}$ | 58.8       | A          |
| Drain Current-Pulsed <sup>a</sup>            | $I_{DM} @ R_{\theta JC}$ | 124        | A          |
| Maximum Power Dissipation                    | $P_D$                    | 27.8       | W          |
| Single Pulsed Avalanche Energy <sup>e</sup>  | $E_{AS}$                 | 10         | mJ         |
| Single Pulsed Avalanche Current <sup>e</sup> | $I_{AS}$                 | 4.5        | A          |
| Operating and Store Temperature Range        | $T_J, T_{stg}$           | -55 to 150 | $^\circ C$ |

### Thermal Characteristics

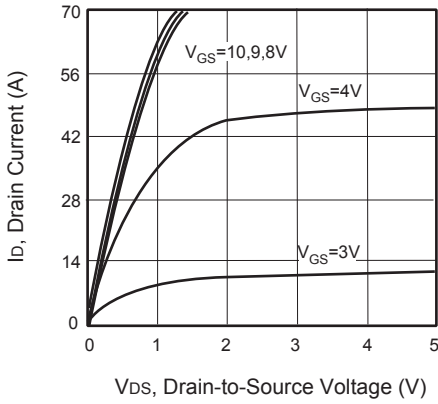
| Parameter  | Symbol          | Limit | Units        |
|--|-----------------|-------|--------------|
| Thermal Resistance, Junction-to-Case                 | $R_{\theta JC}$ | 4.5   | $^\circ C/W$ |
| Thermal Resistance, Junction-to-Ambient <sup>b</sup> | $R_{\theta JA}$ | 20    | $^\circ C/W$ |



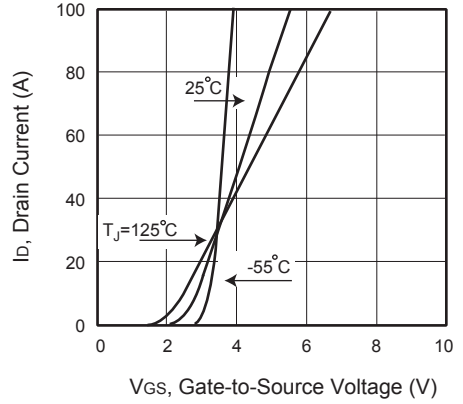
# CEZ16R10LA

## Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

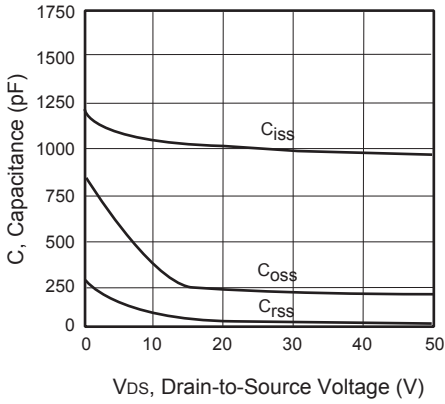
| Parameter  | Symbol       | Test Condition  | Min | Typ  | Max  | Units     |
|--|--------------|---|-----|------|------|-----------|
| <b>Off Characteristics</b>   |              |   |     |      |      |           |
| Drain-Source Breakdown Voltage   | $BV_{DSS}$   | $V_{GS} = 0V, I_D = 250\mu A$                             | 100 |      |      | V         |
| Zero Gate Voltage Drain Current  | $I_{DSS}$    | $V_{DS} = 100V, V_{GS} = 0V$                              |     |      | 10   | $\mu A$   |
| Gate Body Leakage Current, Forward   | $I_{GSSF}$   | $V_{GS} = 20V, V_{DS} = 0V$                               |     |      | 100  | nA        |
| Gate Body Leakage Current, Reverse   | $I_{GSSR}$   | $V_{GS} = -20V, V_{DS} = 0V$                              |     |      | -100 | nA        |
| <b>On Characteristics <sup>c</sup></b>   |              |   |     |      |      |           |
| Gate Threshold Voltage   | $V_{GS(th)}$ | $V_{GS} = V_{DS}, I_D = 250\mu A$                         | 1   |      | 2.5  | V         |
| Static Drain-Source On-Resistance  | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 20A$                                 |     | 13.4 | 16   | $m\Omega$ |
|  |              | $V_{GS} = 4.5V, I_D = 10A$                                |     | 18.4 | 24   | $m\Omega$ |
| <b>Dynamic Characteristics <sup>d</sup></b>  |              |   |     |      |      |           |
| Input Capacitance  | $C_{iss}$    | $V_{DS} = 50V, V_{GS} = 0V, f = 1.0\text{ MHz}$           |     | 900  |      | pF        |
| Output Capacitance   | $C_{oss}$    |   |     | 205  |      | pF        |
| Reverse Transfer Capacitance   | $C_{rss}$    |   |     | 15   |      | pF        |
| <b>Switching Characteristics <sup>d</sup></b>  |              |   |     |      |      |           |
| Turn-On Delay Time   | $t_{d(on)}$  | $V_{DD} = 50V, I_D = 1A, V_{GS} = 10V, R_{GEN} = 6\Omega$ |     | 17   |      | ns        |
| Turn-On Rise Time  | $t_r$        |   |     | 4    |      | ns        |
| Turn-Off Delay Time  | $t_{d(off)}$ |   |     | 42   |      | ns        |
| Turn-Off Fall Time   | $t_f$        |   |     | 20   |      | ns        |
| Total Gate Charge  | $Q_g$        | $V_{DS} = 50V, I_D = 20A, V_{GS} = 4.5V$                  |     | 11.5 |      | nC        |
| Gate-Source Charge   | $Q_{gs}$     |   |     | 1.7  |      | nC        |
| Gate-Drain Charge  | $Q_{gd}$     |   |     | 7.8  |      | nC        |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b>  |              |   |     |      |      |           |
| Drain-Source Diode Forward Current <sup>b</sup>  | $I_S$        |   |     |      | 23   | A         |
| Drain-Source Diode Forward Voltage <sup>c</sup>  | $V_{SD}$     | $V_{GS} = 0V, I_S = 20A$                                  |     |      | 1.2  | V         |
| <b>Notes :</b><br>a.Repetitive Rating : Pulse width limited by maximum junction temperature.<br>b.Surface Mounted on FR4 Board, $t \leq 10$ sec.<br>c.Pulse Test : Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$ .<br>d.Guaranteed by design, not subject to production testing.<br>e.L = 1mH, $I_{AS} = 4.5A, V_{DD} = 24V, R_G = 25\Omega$ , Starting $T_J = 25^\circ\text{C}$ . |              |   |     |      |      |           |



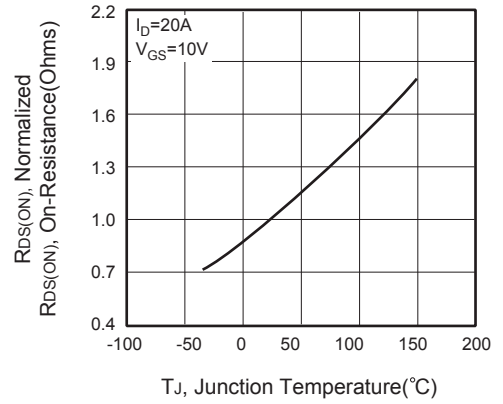
**Figure 1. Output Characteristics**



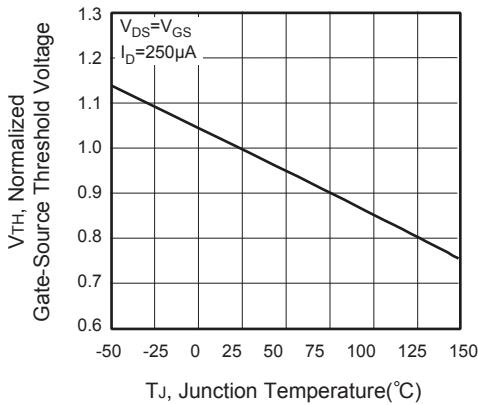
**Figure 2. Transfer Characteristics**



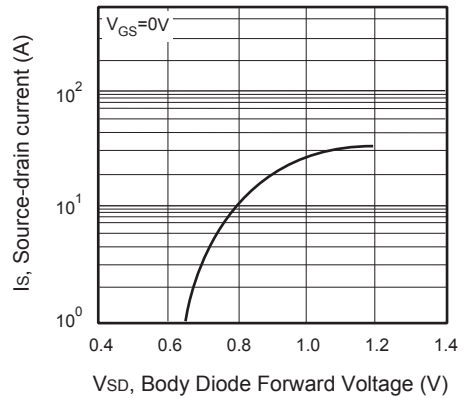
**Figure 3. Capacitance**



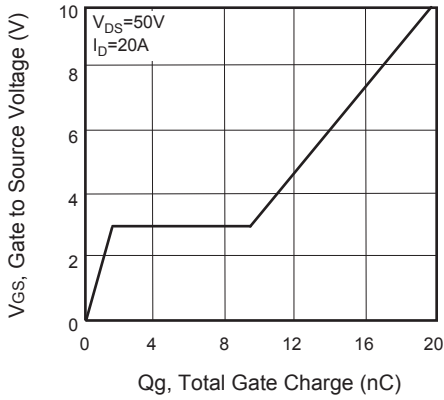
**Figure 4. On-Resistance Variation with Temperature**



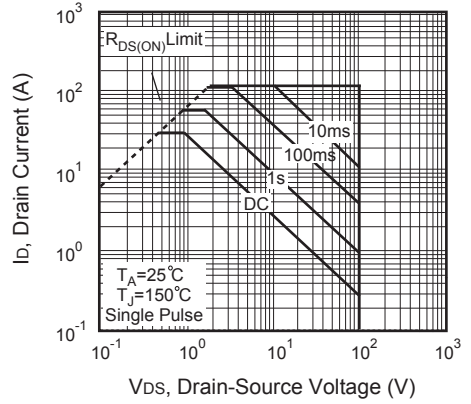
**Figure 5. Gate Threshold Variation with Temperature**



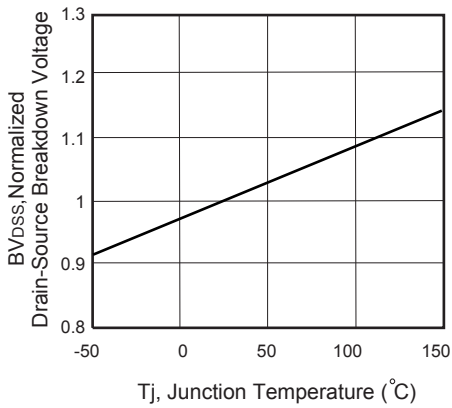
**Figure 6. Body Diode Forward Voltage Variation with Source Current**



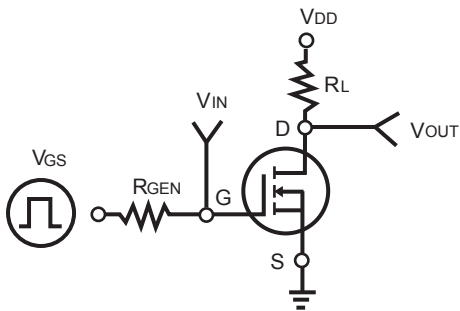
**Figure 7. Gate Charge**



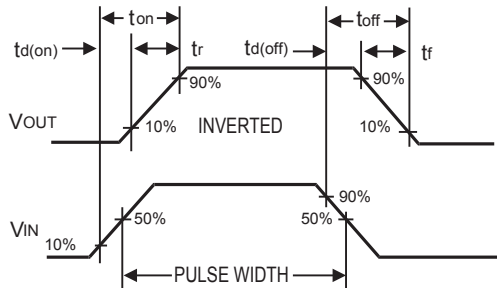
**Figure 8. Maximum Safe Operating Area**



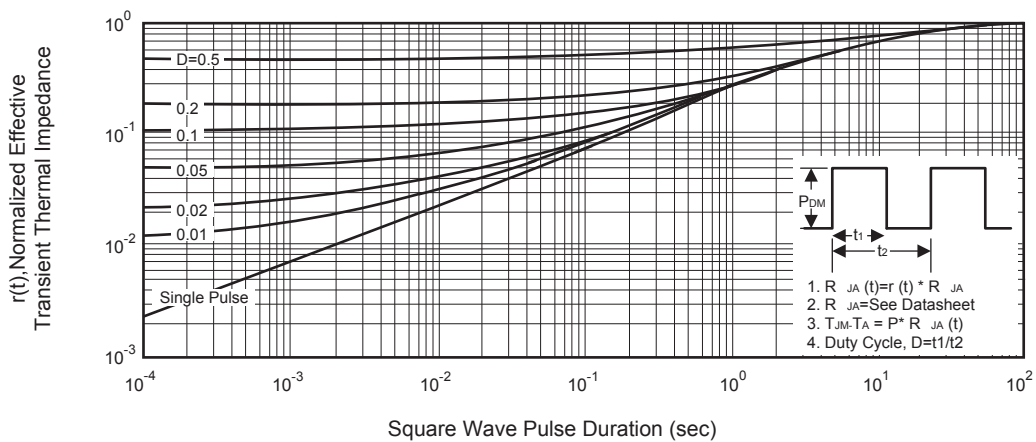
**Figure 9. Breakdown Voltage Variation VS Temperature**



**Figure 10. Switching Test Circuit**



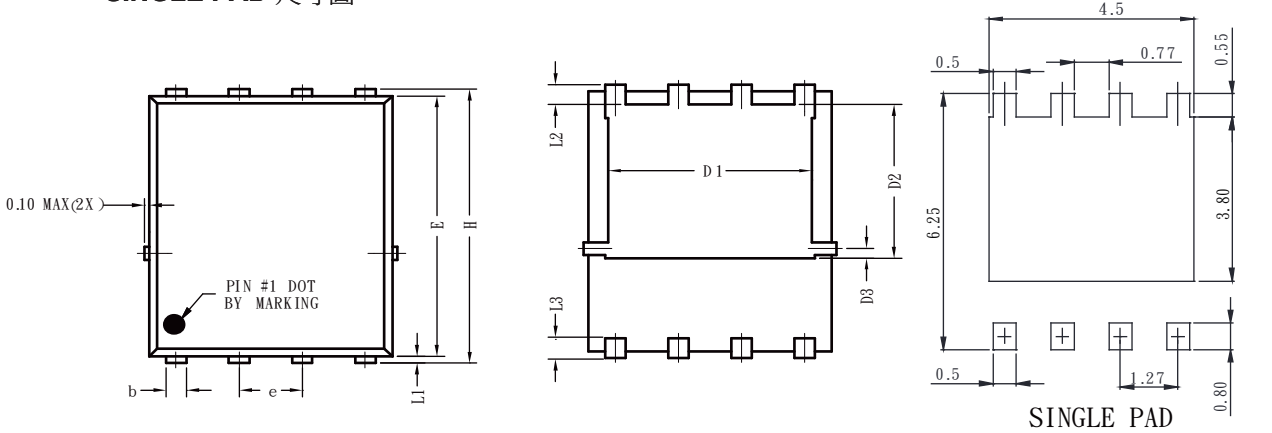
**Figure 11. Switching Waveforms**



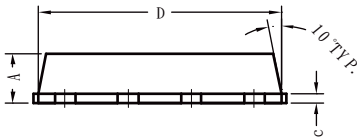
**Figure 12. Normalized Thermal Transient Impedance Curve**

## P-PAK5X6 產品外觀尺寸圖 (Product Outline Dimension)

### SINGLE PAD 尺寸圖



RECOMMENDED LAND PATTERN



| SYMBOLS | MILLIMETERS |       | INCHES    |       |
|---------|-------------|-------|-----------|-------|
|         | MIN         | MAX   | MIN       | MAX   |
| A       | 0.800       | 1.170 | 0.031     | 0.046 |
| b       | 0.340       | 0.490 | 0.013     | 0.019 |
| c       | 0.20        | 0.34  | 0.008     | 0.013 |
| D       | 4.800       | 5.100 | 0.009     | 0.011 |
| D1      | 3.800       | 4.200 | 0.150     | 0.165 |
| D2      | 3.180       | 3.78  | 0.125     | 0.149 |
| D3      | 0.150       | 0.360 | 0.006     | 0.142 |
| E       | 5.650       | 5.900 | 0.222     | 0.232 |
| e       | 1.270 TYP   |       | 0.050 TYP |       |
| H       | 5.900       | 6.150 | 0.232     | 0.242 |
| L1      | 0.050       | 0.250 | 0.002     | 0.010 |
| L2      | 0.380       | 0.620 | 0.015     | 0.024 |
| L3      | 0.380       | 0.75  | 0.015     | 0.030 |