



## SOP8 Plastic-Encapsulate MOSFETS

### CJQ08N02K N-Channel Power MOSFET

#### DESCRIPTION

The device uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications. It is ESD protected

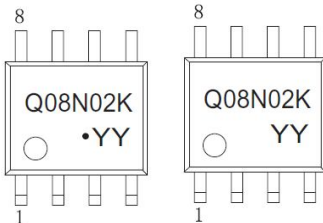
#### FEATURES

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Green Device Available
- High power and current handling capability
- Surface mount package
- ESD protected

#### APPLICATIONS

- Uni-directional or Bi-directional load switch
- Low voltage application, notebook computer power management
- Other battery powered circuits where high-side switching

#### MARKING



Q08N02K =Device code

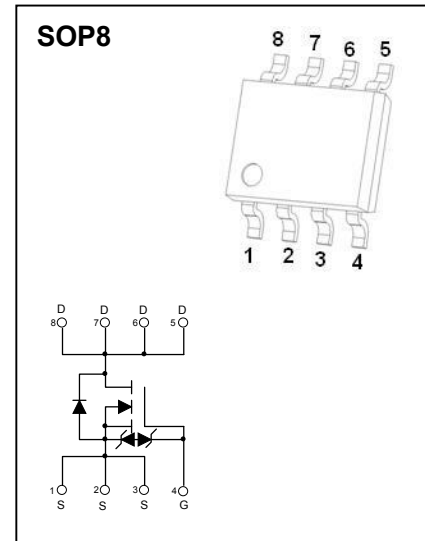
Solid dot=Pin1 indicator

Solid dot = Green molding compound device,  
if none, the normal device

YY=Date Code

#### MAXIMUM RATINGS ( $T_a=25^{\circ}\text{C}$ unless otherwise noted )

| Parameter                                                       | Symbol          | Limit     | Unit                 |
|-----------------------------------------------------------------|-----------------|-----------|----------------------|
| Drain-Source Voltage                                            | $V_{DS}$        | 20        | V                    |
| Gate-Source Voltage                                             | $V_{GS}$        | $\pm 12$  | V                    |
| Continuous Drain Current                                        | $I_D$           | 8         | A                    |
| Pulsed Drain Current                                            | $I_{DM}$        | 32        | A                    |
| Single Pulsed Avalanche Energy                                  | $E_{AS}^{(3)}$  | 50        | mJ                   |
| Power Dissipation                                               | $P_D$           | 1.4       | W                    |
| Thermal Resistance from Junction to Ambient                     | $R_{\theta JA}$ | 89        | $^{\circ}\text{C/W}$ |
| Junction Temperature                                            | $T_J$           | 150       | $^{\circ}\text{C}$   |
| Storage Temperature Range                                       | $T_{stg}$       | -55 ~+150 | $^{\circ}\text{C}$   |
| Lead Temperature for Soldering Purposes(1/8" from case for 10s) | $T_L$           | 260       | $^{\circ}\text{C}$   |



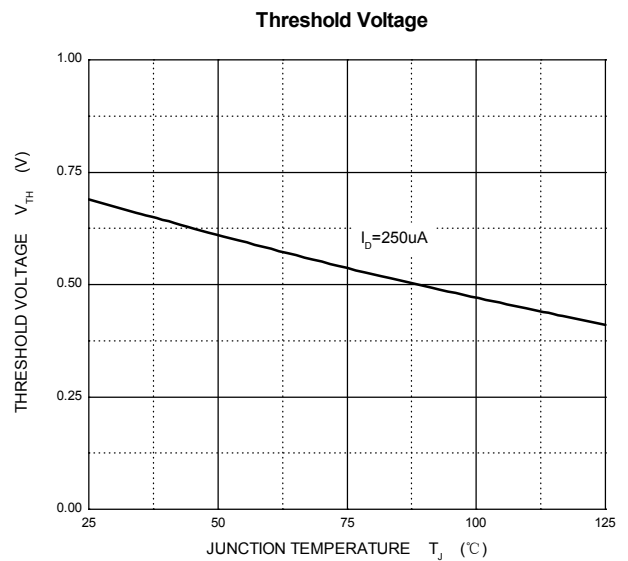
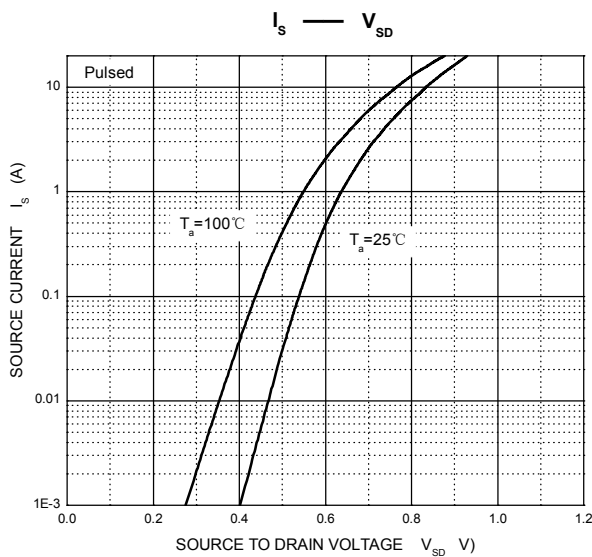
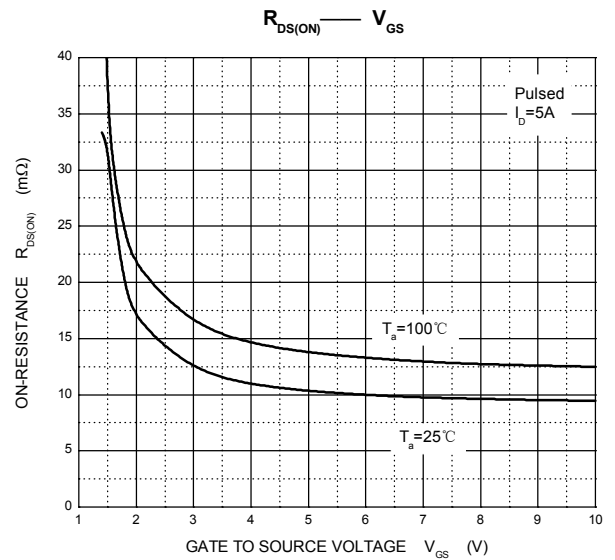
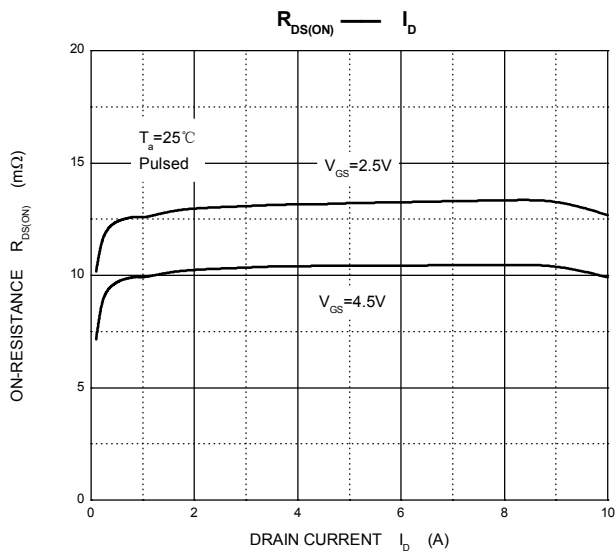
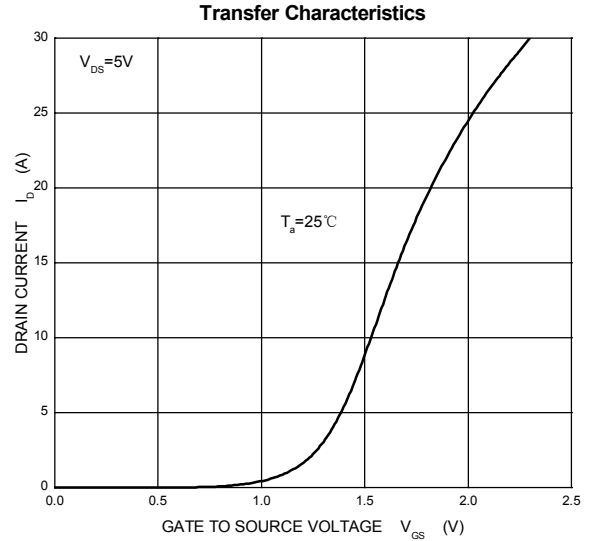
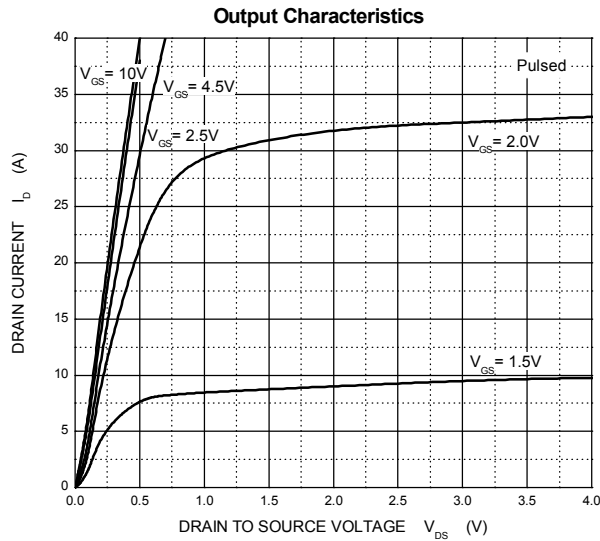
**ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise specified)**

| Parameter                                     | Symbol                | Test Condition                                                                                               | Min  | Typ  | Max | Unit |
|-----------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------|------|------|-----|------|
| Off characteristics                           |                       |                                                                                                              |      |      |     |      |
| Drain-source breakdown voltage                | V <sub>(BR) DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                                                  | 20   |      |     | V    |
| Zero gate voltage drain current               | I <sub>DSS</sub>      | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V                                                                    |      |      | 1   | μA   |
| Gate-body leakage current                     | I <sub>GSS</sub>      | V <sub>DS</sub> =0V, V <sub>GS</sub> =±10V                                                                   |      |      | ±10 | μA   |
| On characteristics (note1)                    |                       |                                                                                                              |      |      |     |      |
| Gate-threshold voltage                        | V <sub>GS(th)</sub>   | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                                     | 0.45 |      | 1.0 | V    |
| Static drain-source on-sate resistance        | R <sub>DS(on)</sub>   | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A                                                                    |      |      | 15  | mΩ   |
|                                               |                       | V <sub>GS</sub> =2.5V, I <sub>D</sub> =4A                                                                    |      |      | 19  | mΩ   |
| Forward transconductance                      | g <sub>FS</sub>       | V <sub>DS</sub> =5V, I <sub>D</sub> =5A                                                                      |      | 16   |     | S    |
| Dynamic characteristics (note 2)              |                       |                                                                                                              |      |      |     |      |
| Input capacitance                             | C <sub>iss</sub>      | V <sub>DS</sub> =10V,V <sub>GS</sub> =0V,<br>f =1MHz                                                         |      | 1800 |     | pF   |
| Output capacitance                            | C <sub>oss</sub>      |                                                                                                              |      | 230  |     |      |
| Reverse transfer capacitance                  | C <sub>rss</sub>      |                                                                                                              |      | 200  |     |      |
| Switching characteristics (note 2)            |                       |                                                                                                              |      |      |     |      |
| Total gate charge                             | Q <sub>g</sub>        | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V,<br>I <sub>D</sub> =8A                                           |      | 17.9 |     | nC   |
| Gate-source charge                            | Q <sub>gs</sub>       |                                                                                                              |      | 1.5  |     |      |
| Gate-drain charge                             | Q <sub>gd</sub>       |                                                                                                              |      | 4.7  |     |      |
| Turn-on delay time                            | t <sub>d(on)</sub>    | V <sub>DD</sub> =10V,I <sub>D</sub> =8A,<br>V <sub>GS</sub> =10V,R <sub>G</sub> =3Ω,<br>R <sub>L</sub> =1.2Ω |      | 2.5  |     | ns   |
| Turn-on rise time                             | t <sub>r</sub>        |                                                                                                              |      | 7.2  |     |      |
| Turn-off delay time                           | t <sub>d(off)</sub>   |                                                                                                              |      | 49   |     |      |
| Turn-off fall time                            | t <sub>f</sub>        |                                                                                                              |      | 10.8 |     |      |
| Drain-Source Diode Characteristics            |                       |                                                                                                              |      |      |     |      |
| Drain-source diode forward voltage(note1)     | V <sub>SD</sub>       | V <sub>GS</sub> =0V, I <sub>S</sub> =8A                                                                      |      |      | 1.2 | V    |
| Continuous drain-source diode forward current | I <sub>S</sub>        |                                                                                                              |      |      | 8   | A    |
| Pulsed drain-source diode forward current     | I <sub>SM</sub>       |                                                                                                              |      |      | 32  | A    |

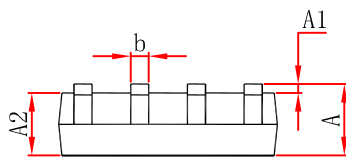
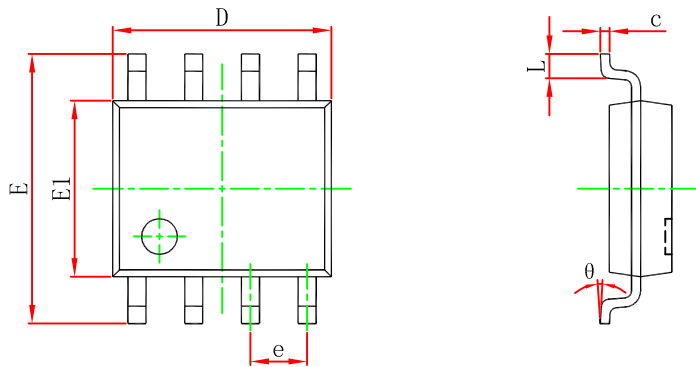
Notes:

1. Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.
2. Guaranteed by design, not subject to production testing.
3. E<sub>AS</sub> condition: V<sub>DD</sub>=20V, L=0.1mH, R<sub>G</sub>=25Ω, Starting T<sub>J</sub> = 25°C

# Typical Characteristics

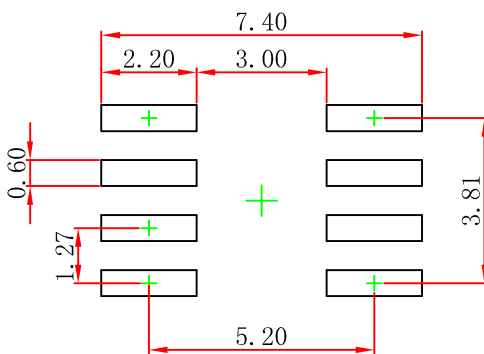


## SOP8 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.350                     | 1.750 | 0.053                | 0.069 |
| A1     | 0.100                     | 0.250 | 0.004                | 0.010 |
| A2     | 1.350                     | 1.550 | 0.053                | 0.061 |
| b      | 0.330                     | 0.510 | 0.013                | 0.020 |
| c      | 0.170                     | 0.250 | 0.007                | 0.010 |
| D      | 4.800                     | 5.000 | 0.189                | 0.197 |
| e      | 1.270 (BSC)               |       | 0.050 (BSC)          |       |
| E      | 5.800                     | 6.200 | 0.228                | 0.244 |
| E1     | 3.800                     | 4.000 | 0.150                | 0.157 |
| L      | 0.400                     | 1.270 | 0.016                | 0.050 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## SOP8 Suggested Pad Layout



### Note:

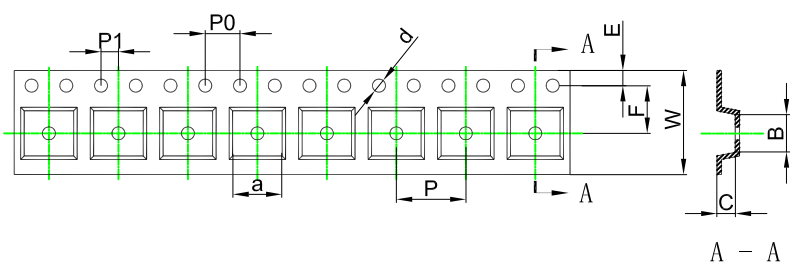
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

JCET reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JCET does not assume any liability arising out of the application or use of any product described herein.

SOP8 Tape and Reel

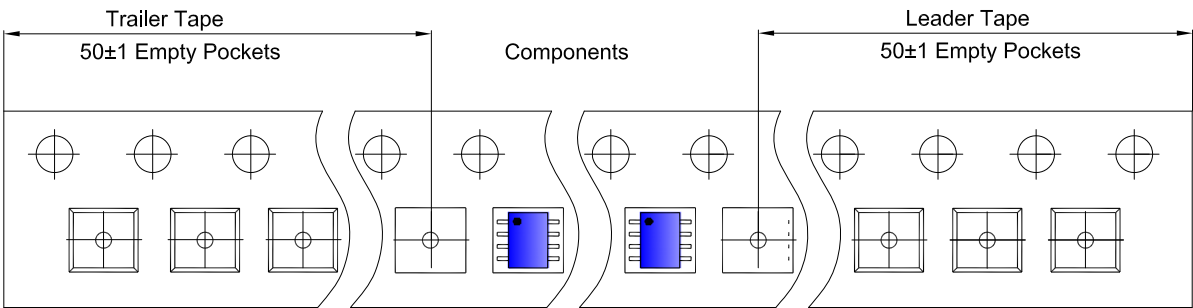
SOP8 Embossed Carrier Tape



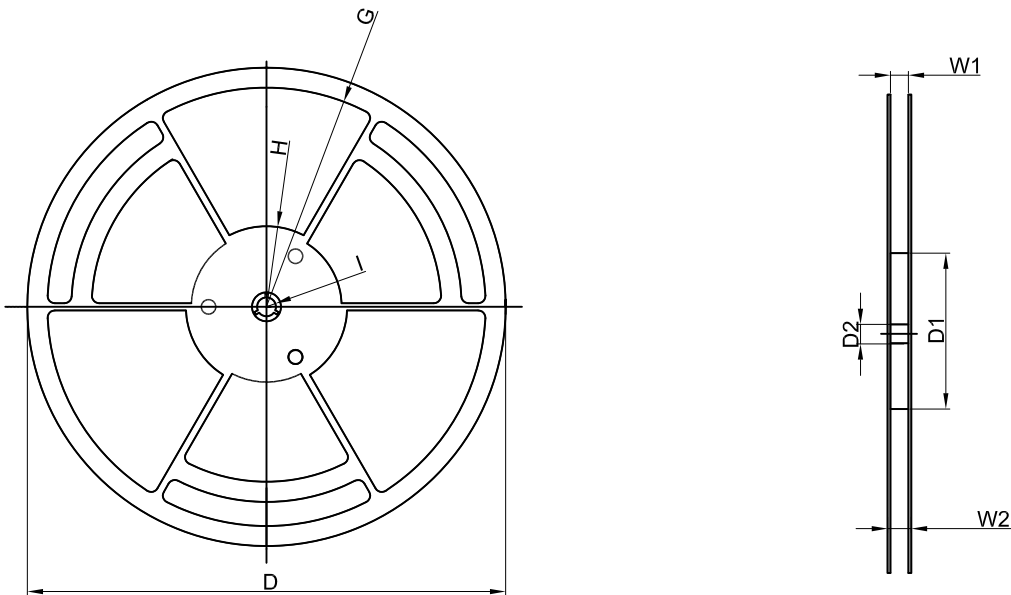
Packaging Description:  
SOP8 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 33cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).  
ALL DIM IN mm

| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |       |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| Pkg type                     | a    | B    | C    | d     | E    | F    | P0   | P    | P1   | W     |
| SOP8                         | 6.40 | 5.40 | 2.10 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |

SOP8 Tape Leader and Trailer



SOP8 Reel



| Dimensions are in millimeter |         |        |       |         |        |       |       |       |
|------------------------------|---------|--------|-------|---------|--------|-------|-------|-------|
| Reel Option                  | D       | D1     | D2    | G       | H      | I     | W1    | W2    |
| 13"Dia                       | Ø330.00 | 100.00 | 13.00 | R151.00 | R56.00 | R6.50 | 12.40 | 17.60 |

| REEL      | Reel Size | Box       | Box Size(mm) | Carton     | Carton Size(mm) | G.W.(kg) |
|-----------|-----------|-----------|--------------|------------|-----------------|----------|
| 4,000 pcs | 13 inch   | 8,000 pcs | 360×360×65   | 64,000 pcs | 565×380×390     |          |