

## N-Channel Logic Level Enhancement Mode Power MOSFET

# MTB06N03Q8

|                   |               |
|-------------------|---------------|
| $BV_{DSS}$        | 30V           |
| $I_D$             | 18A           |
| $R_{DS(on)(max)}$ | 6.8m $\Omega$ |

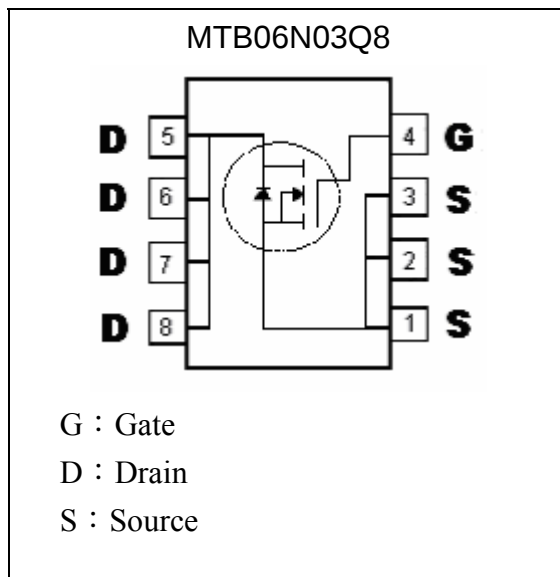
### Description

The MTB06N03Q8 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

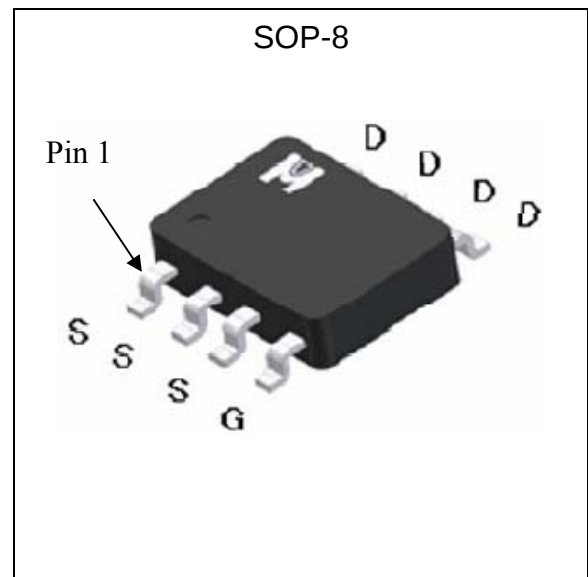
### Features

- Single Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Dynamic dv/dt rating
- Repetitive Avalanche Rated
- Pb-free and Halogen-free package

### Symbol



### Outline



**Absolute Maximum Ratings** (Ta=25°C)

| Parameter                                                            | Symbol                            | Limits                       | Unit |
|----------------------------------------------------------------------|-----------------------------------|------------------------------|------|
| Drain-Source Voltage                                                 | V <sub>DS</sub>                   | 30                           | V    |
| Gate-Source Voltage                                                  | V <sub>GS</sub>                   | ±20                          |      |
| Continuous Drain Current @ T <sub>C</sub> =25°C                      | I <sub>D</sub>                    | 18                           | A    |
| Continuous Drain Current @ T <sub>C</sub> =100°C                     |                                   | 12                           |      |
| Pulsed Drain Current                                                 | I <sub>DM</sub>                   | 72 *1                        |      |
| Avalanche Current                                                    | I <sub>AS</sub>                   | 20                           |      |
| Avalanche Energy @ L=0.1mH, I <sub>D</sub> =20A, R <sub>G</sub> =25Ω | E <sub>AS</sub>                   | 20                           | mJ   |
| Repetitive Avalanche Energy @ L=0.05mH                               | E <sub>AR</sub>                   | 10 *2                        |      |
| Total Power Dissipation                                              | P <sub>D</sub>                    | T <sub>A</sub> =25°C<br>3    | W    |
|                                                                      |                                   | T <sub>A</sub> =100°C<br>1.5 |      |
| Operating Junction and Storage Temperature Range                     | T <sub>j</sub> , T <sub>stg</sub> | -55~+175                     | °C   |

**Thermal Data**

| Parameter                                    | Symbol              | Value | Unit |
|----------------------------------------------|---------------------|-------|------|
| Thermal Resistance, Junction-to-case, max    | R <sub>th,j-c</sub> | 25    | °C/W |
| Thermal Resistance, Junction-to-ambient, max | R <sub>th,j-a</sub> | 50 *3 | °C/W |

- Note : 1. Pulse width limited by maximum junction temperature  
 2. Duty cycle ≤ 1%  
 3. Surface mounted on 1 in<sup>2</sup> copper pad of FR-4 board, 125°C/W when mounted on minimum copper pad

**Characteristics (T<sub>C</sub>=25°C, unless otherwise specified)**

| Symbol                 | Min. | Typ. | Max. | Unit | Test Conditions                                                   |
|------------------------|------|------|------|------|-------------------------------------------------------------------|
| <b>Static</b>          |      |      |      |      |                                                                   |
| BV <sub>DSS</sub>      | 30   | -    | -    | V    | V <sub>GS</sub> =0, I <sub>D</sub> =250μA                         |
| V <sub>GS(th)</sub>    | 1.0  | 1.5  | 3.0  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA         |
| G <sub>FS</sub> *1     | -    | 25   | -    | S    | V <sub>DS</sub> = 5V, I <sub>D</sub> =18A                         |
| I <sub>GSS</sub>       | -    | -    | ±100 | nA   | V <sub>GS</sub> =±20                                              |
| I <sub>DSS</sub>       | -    | -    | 1    | μA   | V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0                        |
|                        | -    | -    | 25   |      | V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0, T <sub>j</sub> =125°C |
| I <sub>D(ON)</sub> *1  | 12   | -    | -    | A    | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V                      |
| R <sub>DS(ON)</sub> *1 | -    | 6    | 6.8  | mΩ   | V <sub>GS</sub> = 10V, I <sub>D</sub> =18A                        |
|                        | -    | 9.2  | 11.8 | mΩ   | V <sub>GS</sub> = 4.5V, I <sub>D</sub> =12A                       |
| <b>Dynamic</b>         |      |      |      |      |                                                                   |
| C <sub>iss</sub>       | -    | 4753 | -    | pF   | V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz                 |
| C <sub>oss</sub>       | -    | 495  | -    |      |                                                                   |
| C <sub>rss</sub>       | -    | 348  | -    |      |                                                                   |

**Characteristics (T<sub>c</sub>=25°C, unless otherwise specified)**

| Symbol                                       | Min. | Typ. | Max. | Unit | Test Conditions                                                                          |
|----------------------------------------------|------|------|------|------|------------------------------------------------------------------------------------------|
| Q <sub>g</sub> (V <sub>GS</sub> =10V) *1, 2  | -    | 53   | -    | nC   | V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =18A                          |
| Q <sub>g</sub> (V <sub>GS</sub> =4.5V) *1, 2 | -    | 30   | -    |      |                                                                                          |
| Q <sub>gs</sub> *1, 2                        | -    | 8    | -    |      |                                                                                          |
| Q <sub>gd</sub> *1, 2                        | -    | 17   | -    |      |                                                                                          |
| t <sub>d(ON)</sub> *1, 2                     | -    | 22   | -    | ns   | V <sub>DS</sub> =15V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V,<br>R <sub>GS</sub> =2.7Ω |
| t <sub>r</sub> *1, 2                         | -    | 16   | -    |      |                                                                                          |
| t <sub>d(OFF)</sub> *1, 2                    | -    | 65   | -    |      |                                                                                          |
| t <sub>f</sub> *1, 2                         | -    | 10   | -    |      |                                                                                          |
| R <sub>g</sub>                               | -    | 1.2  | -    | Ω    | V <sub>GS</sub> =15mV, V <sub>DS</sub> =0V, f=1MHz                                       |
| <b>Source-Drain Diode</b>                    |      |      |      |      |                                                                                          |
| I <sub>S</sub> *1                            | -    | -    | 4    | A    |                                                                                          |
| I <sub>SM</sub> *3                           | -    | -    | 40   |      |                                                                                          |
| V <sub>SD</sub> *1                           | -    | -    | 1.2  | V    | I <sub>F</sub> =I <sub>S</sub> , V <sub>GS</sub> =0V                                     |
| t <sub>rr</sub>                              | -    | 32   | -    | ns   | I <sub>F</sub> =I <sub>S</sub> , dI <sub>F</sub> /dt=100A/μs                             |
| Q <sub>rr</sub>                              | -    | 12   | -    | nC   |                                                                                          |

Note : \*1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

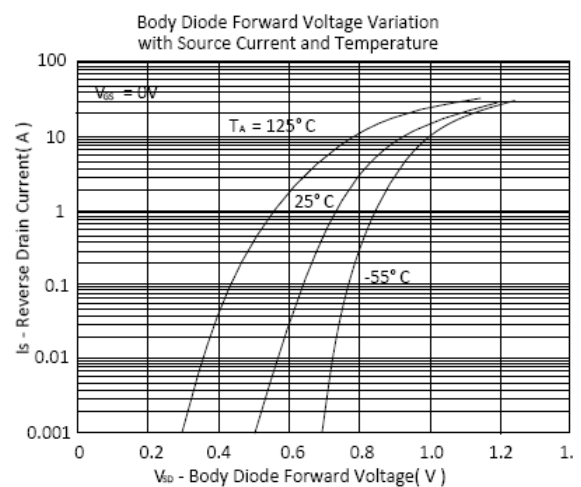
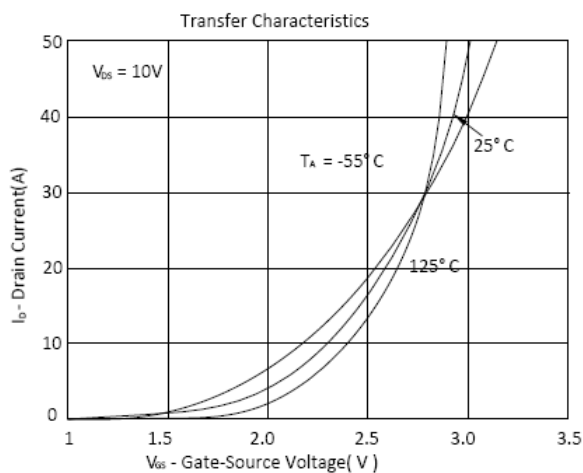
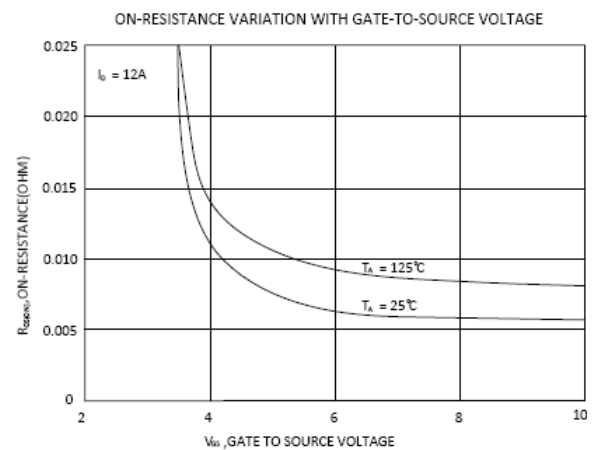
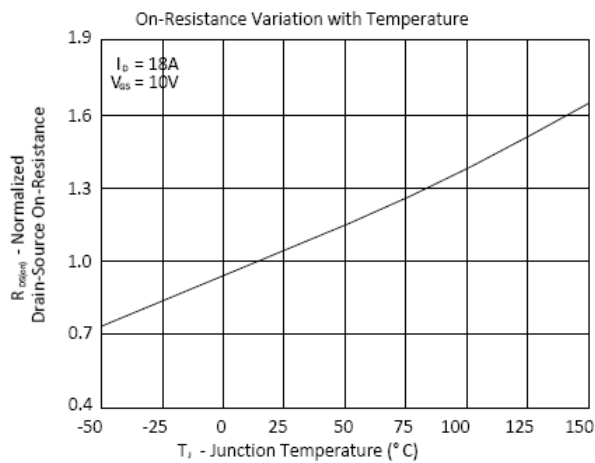
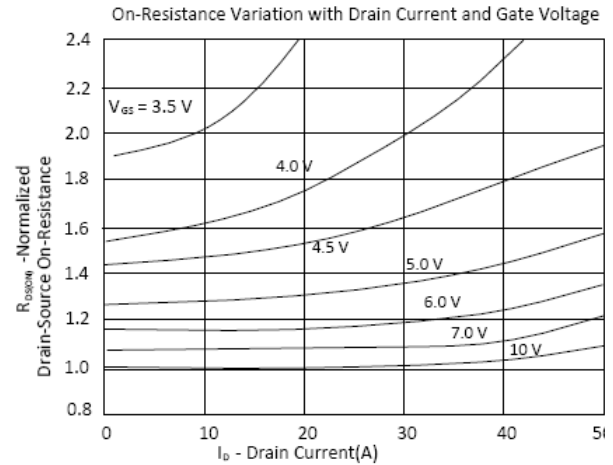
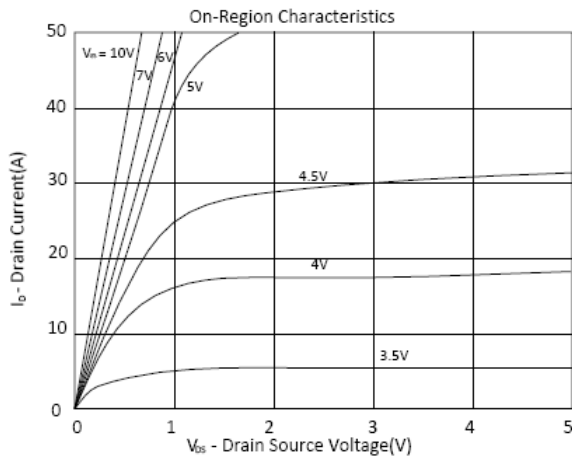
\*2.Independent of operating temperature

\*3.Pulse width limited by maximum junction temperature.

**Ordering Information**

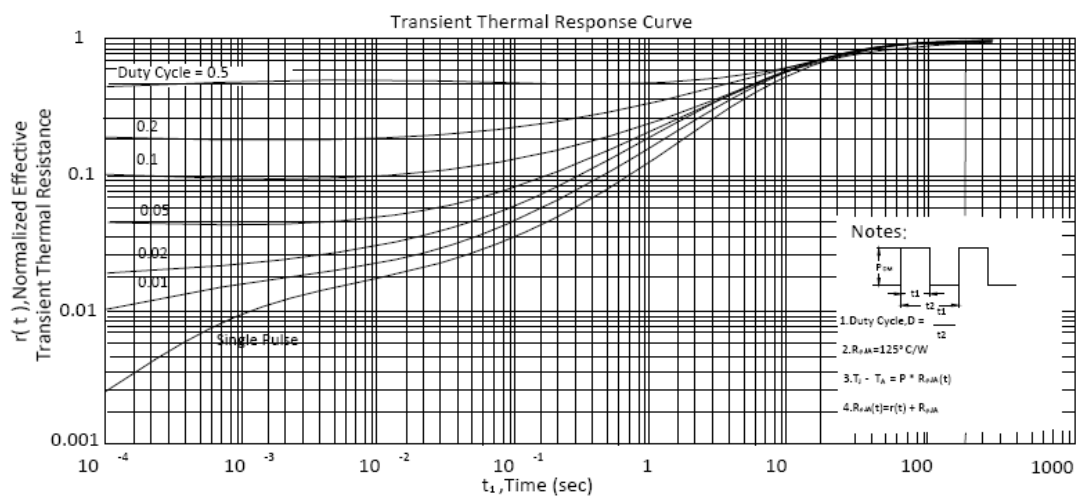
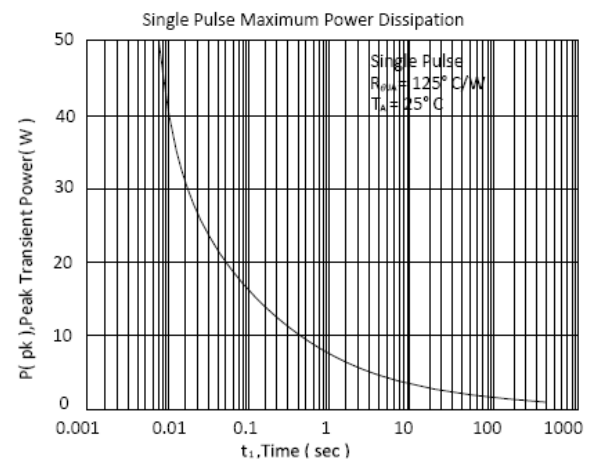
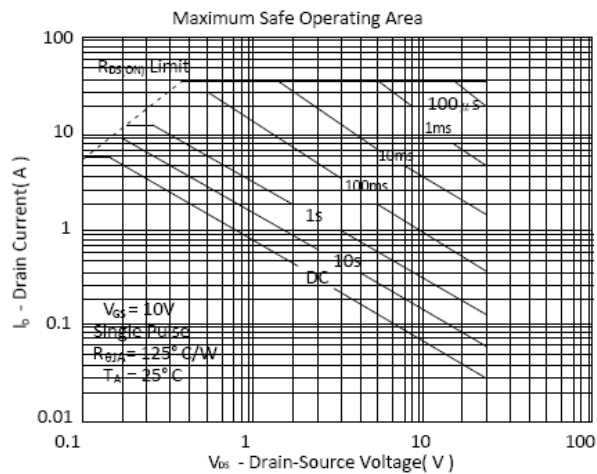
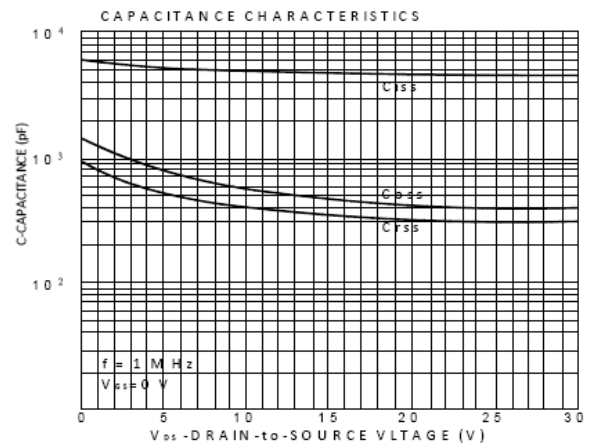
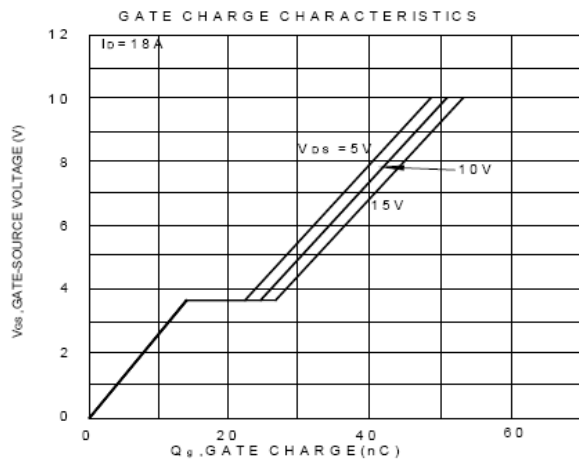
| Device     | Package                                   | Shipping               | Marking |
|------------|-------------------------------------------|------------------------|---------|
| MTB06N03Q8 | SOP-8<br>(Pb-free & Halogen-free package) | 3000 pcs / Tape & Reel | B06N03  |

## Characteristic Curves

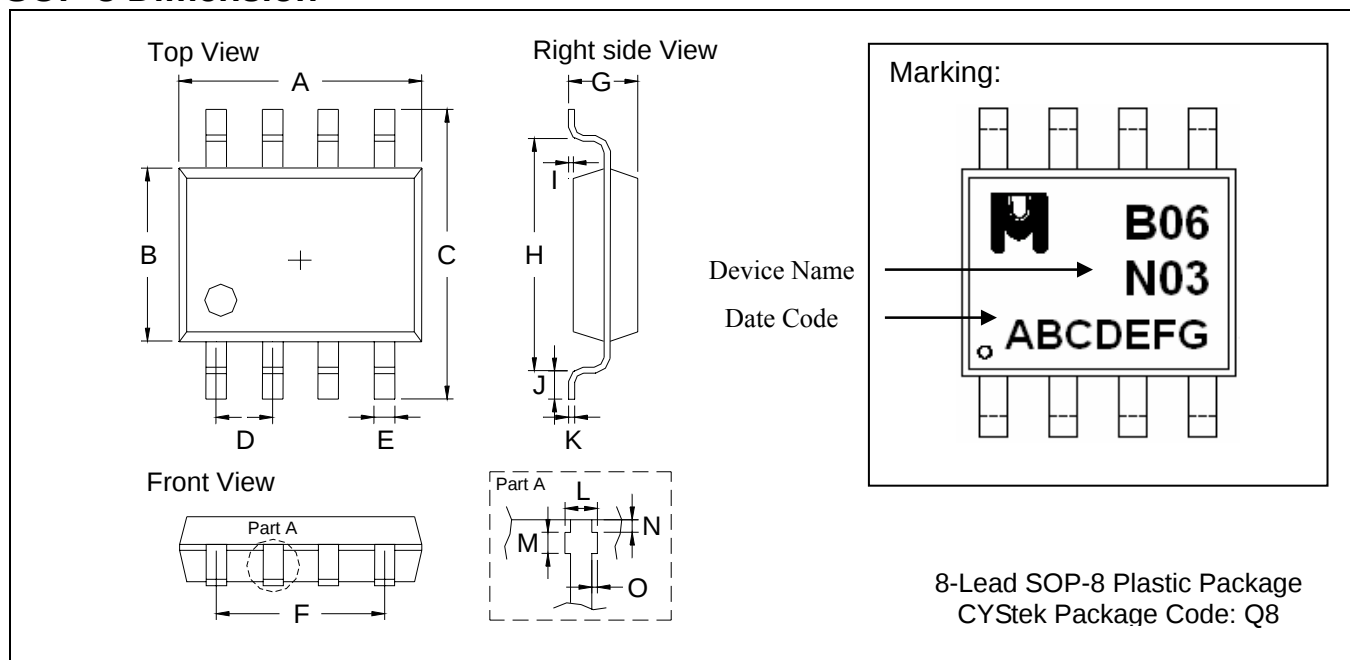




## Characteristic Curves(Cont.)



## SOP-8 Dimension



\*: Typical

| DIM | Inches |        | Millimeters |      | DIM | Inches |        | Millimeters |      |
|-----|--------|--------|-------------|------|-----|--------|--------|-------------|------|
|     | Min.   | Max.   | Min.        | Max. |     | Min.   | Max.   | Min.        | Max. |
| A   | 0.1909 | 0.2007 | 4.85        | 5.10 | I   | 0.0019 | 0.0078 | 0.05        | 0.20 |
| B   | 0.1515 | 0.1555 | 3.85        | 3.95 | J   | 0.0118 | 0.0275 | 0.30        | 0.70 |
| C   | 0.2283 | 0.2441 | 5.80        | 6.20 | K   | 0.0074 | 0.0098 | 0.19        | 0.25 |
| D   | 0.0480 | 0.0519 | 1.22        | 1.32 | L   | 0.0145 | 0.0204 | 0.37        | 0.52 |
| E   | 0.0145 | 0.0185 | 0.37        | 0.47 | M   | 0.0118 | 0.0197 | 0.30        | 0.50 |
| F   | 0.1472 | 0.1527 | 3.74        | 3.88 | N   | 0.0031 | 0.0051 | 0.08        | 0.13 |
| G   | 0.0570 | 0.0649 | 1.45        | 1.65 | O   | 0.0000 | 0.0059 | 0.00        | 0.15 |
| H   | 0.1889 | 0.2007 | 4.80        | 5.10 |     |        |        |             |      |

Notes: 1.Controlling dimension: millimeters.

2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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