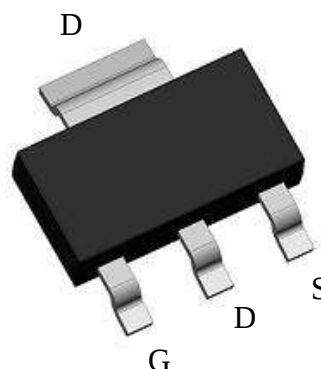


## N-Channel Enhancement Mode Power MOSFET

### Description :

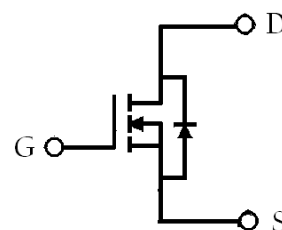
The KLEA2N15 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The SOT-223 package is universally preferred for all commercial-industrial surface mount applications.

SOT-223



### Features:

- Single Drive Requirement
- Fast Switching Characteristic
- Repetitive Avalanche Rated
- Pb-free lead plating and halogen-free package



G : Gate D : Drain S : Source

|                                                                  |                   |
|------------------------------------------------------------------|-------------------|
| <b>B<sub>VDSS</sub></b>                                          | <b>150V</b>       |
| <b>I<sub>D</sub>@V<sub>GS</sub>=10V, T<sub>A</sub>=25°C</b>      | <b>3A</b>         |
| <b>R<sub>DS(on)</sub>@V<sub>GS</sub>=10V, I<sub>D</sub>=2.8A</b> | <b>119mΩ(typ)</b> |

### Ordering Information

| Device   | Package                                                    | Shipping               |
|----------|------------------------------------------------------------|------------------------|
| KLEA2N15 | SOT-223<br>(Pb-free lead plating and halogen-free package) | 2500 pcs / tape & reel |

## Absolute Maximum Ratings (Ta=25°C)

| Parameter                                                             | Symbol                            | Limits                | Unit |
|-----------------------------------------------------------------------|-----------------------------------|-----------------------|------|
| Drain-Source Voltage                                                  | V <sub>DS</sub>                   | 150                   | V    |
| Gate-Source Voltage                                                   | V <sub>GS</sub>                   | ±20                   |      |
| Continuous Drain Current @V <sub>GS</sub> =10V, T <sub>C</sub> =25°C  | I <sub>D</sub>                    | 5.2                   | A    |
| Continuous Drain Current @V <sub>GS</sub> =10V, T <sub>C</sub> =100°C |                                   | 3.3                   |      |
| Continuous Drain Current @V <sub>GS</sub> =10V, T <sub>A</sub> =25°C  |                                   | 3                     |      |
| Continuous Drain Current @V <sub>GS</sub> =10V, T <sub>A</sub> =70°C  |                                   | 2.4                   |      |
| Pulsed Drain Current                                                  | I <sub>DM</sub>                   | 16 *1                 |      |
| Total Power Dissipation                                               | P <sub>D</sub>                    | T <sub>C</sub> =25°C  | W    |
|                                                                       |                                   | T <sub>C</sub> =100°C |      |
|                                                                       |                                   | T <sub>A</sub> =25°C  |      |
|                                                                       |                                   | T <sub>A</sub> =100°C |      |
| Operating Junction and Storage Temperature Range                      | T <sub>j</sub> , T <sub>stg</sub> | -55~+150              | °C   |

## Thermal Data

| Parameter                                    | Symbol              | Value | Unit |
|----------------------------------------------|---------------------|-------|------|
| Thermal Resistance, Junction-to-case, max    | R <sub>th,j-c</sub> | 15    | °C/W |
| Thermal Resistance, Junction-to-ambient, max | R <sub>th,j-a</sub> | 45 *3 |      |

- 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, 120°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>      | 150  | -    | -    | V    | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                        |
| V <sub>GS(th)</sub>    | 2.0  | -    | 4.0  |      | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA         |
| G <sub>FS</sub> *1     | -    | 4.5  | -    | S    | V <sub>DS</sub> =10V, I <sub>D</sub> =1.6A                        |
| I <sub>GSS</sub>       | -    | -    | ±100 | nA   | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                        |
| I <sub>DSS</sub>       | -    | -    | 1    | μA   | V <sub>DS</sub> =120V, V <sub>GS</sub> =0V                        |
|                        | -    | -    | 25   |      | V <sub>DS</sub> =120V, V <sub>GS</sub> =0V, T <sub>j</sub> =125°C |
| R <sub>DS(ON)</sub> *1 | -    | 119  | 160  | mΩ   | V <sub>GS</sub> =10V, I <sub>D</sub> =2.8A                        |
| <b>Dynamic</b>         |      |      |      |      |                                                                   |
| C <sub>iss</sub>       | -    | 536  | -    | pF   | V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz                 |
| C <sub>oss</sub>       | -    | 57   | -    |      |                                                                   |
| C <sub>rss</sub>       | -    | 21   | -    |      |                                                                   |

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

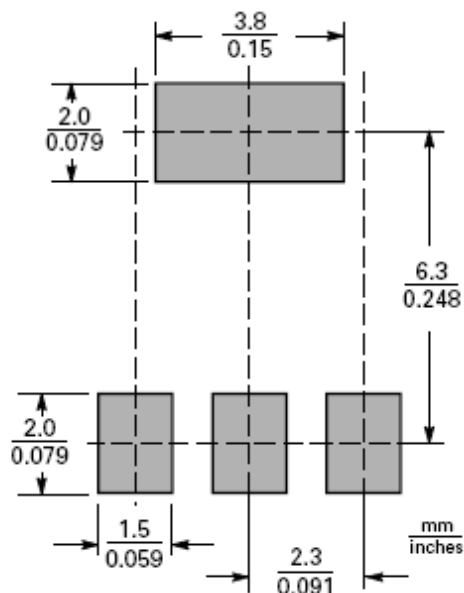
| Symbol                     | Min. | Typ. | Max. | Unit | Test Conditions                                                                     |
|----------------------------|------|------|------|------|-------------------------------------------------------------------------------------|
| Qg *1, 2                   | -    | 12   | -    | nC   | V <sub>DS</sub> =75V, V <sub>GS</sub> =10V, I <sub>D</sub> =3A                      |
| Qgs *1, 2                  | -    | 2.2  | -    |      |                                                                                     |
| Qgd *1, 2                  | -    | 4.9  | -    |      |                                                                                     |
| t <sub>d</sub> (ON) *1, 2  | -    | 6    | -    | ns   | V <sub>DS</sub> =25V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V, R <sub>GS</sub> =6Ω |
| tr *1, 2                   | -    | 12   | -    |      |                                                                                     |
| t <sub>d</sub> (OFF) *1, 2 | -    | 17   | -    |      |                                                                                     |
| t <sub>f</sub> *1, 2       | -    | 4    | -    |      |                                                                                     |
| Source-Drain Diode         |      |      |      |      |                                                                                     |
| I <sub>S</sub> *1          | -    | -    | 2.1  | A    |                                                                                     |
| I <sub>SM</sub> *3         | -    | -    | 8.4  |      |                                                                                     |
| V <sub>SD</sub> *1         | -    | 0.76 | 1.3  | V    | I <sub>F</sub> =I <sub>S</sub> , V <sub>GS</sub> =0V                                |
| trr                        | -    | 40   | -    | ns   | I <sub>F</sub> =I <sub>S</sub> , dI <sub>F</sub> /dt=100A/μs                        |
| Q <sub>rr</sub>            | -    | 100  | -    | nC   |                                                                                     |

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

\*2.Independent of operating temperature

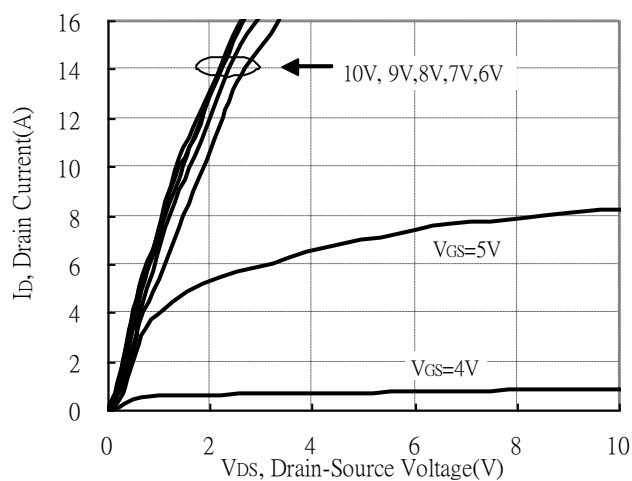
\*3.Pulse width limited by maximum junction temperature.

## Recommended soldering footprint

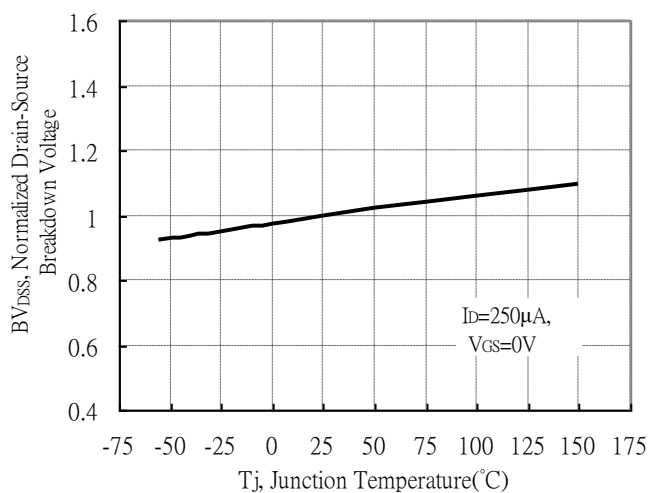


## Typical Characteristics

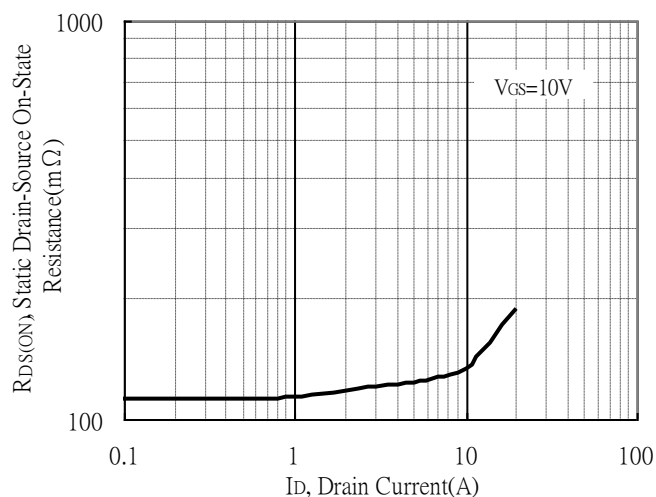
Typical Output Characteristics



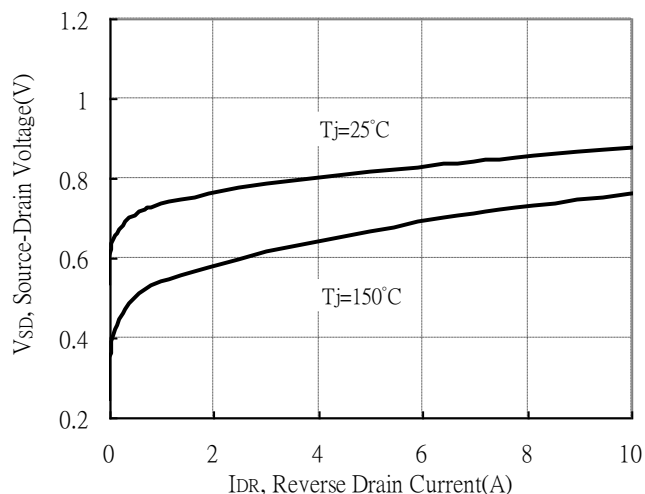
Breakdown Voltage vs Ambient Temperature



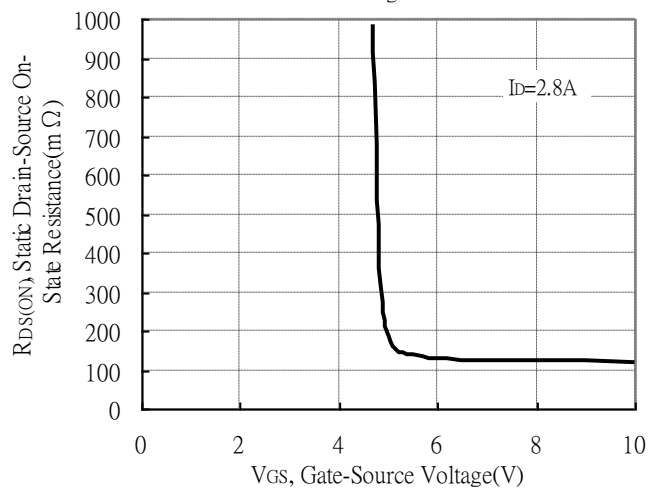
Static Drain-Source On-State resistance vs Drain Current



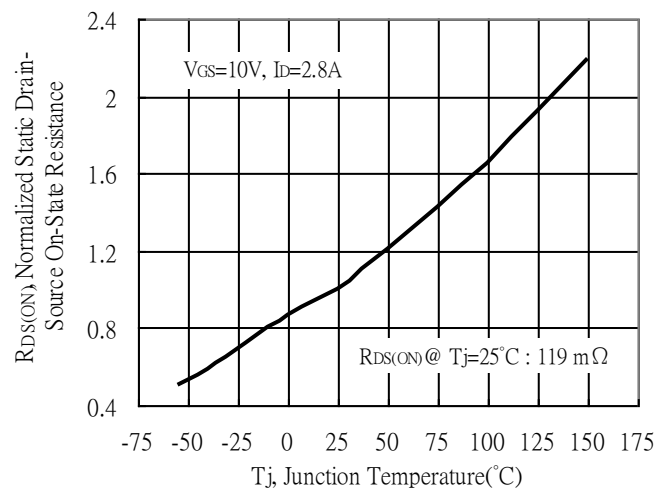
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

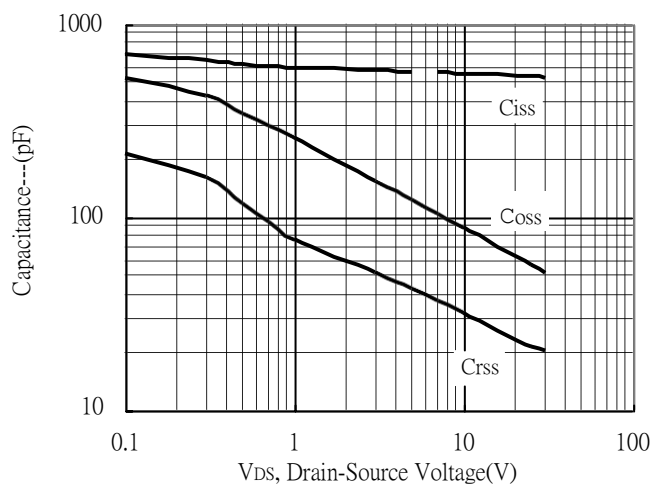


Drain-Source On-State Resistance vs Junction Temperature

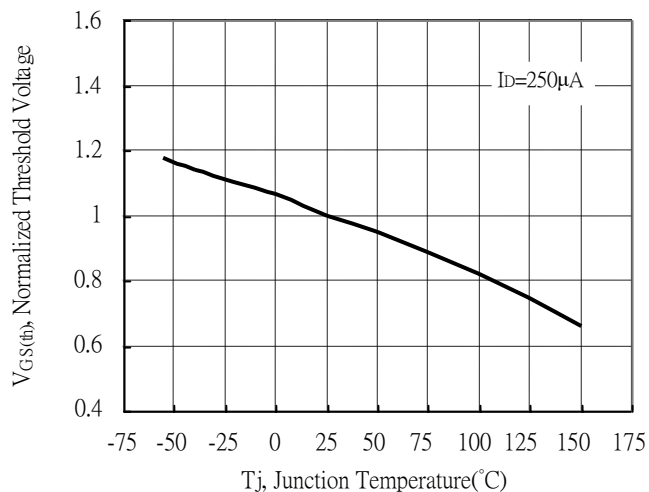


## Typical Characteristics(Cont.)

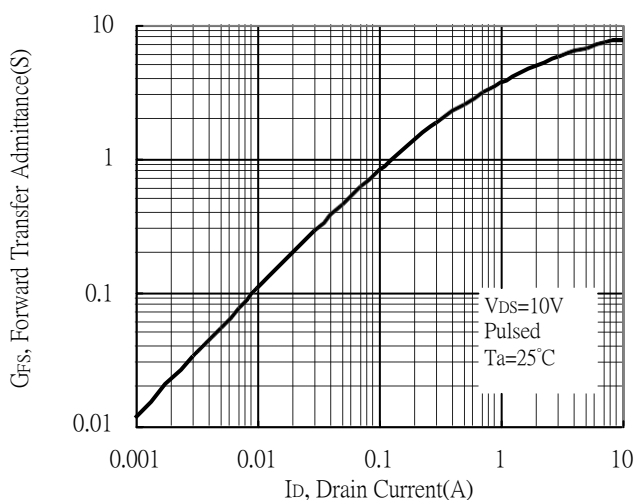
Capacitance vs Drain-to-Source Voltage



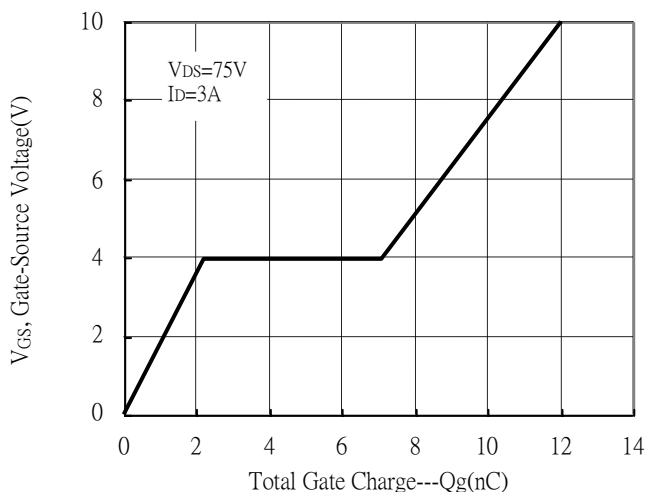
Threshold Voltage vs Junction Temperature



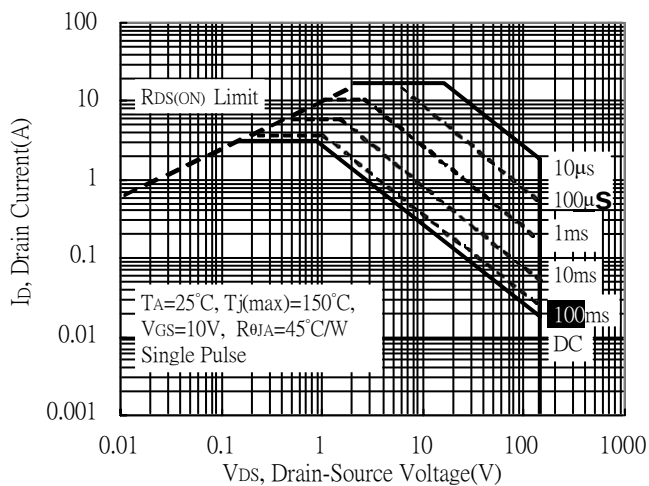
Forward Transfer Admittance vs Drain Current



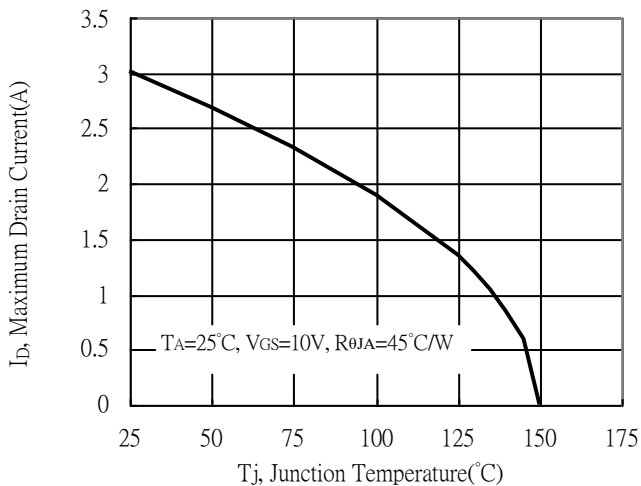
Gate Charge Characteristics



Maximum Safe Operating Area

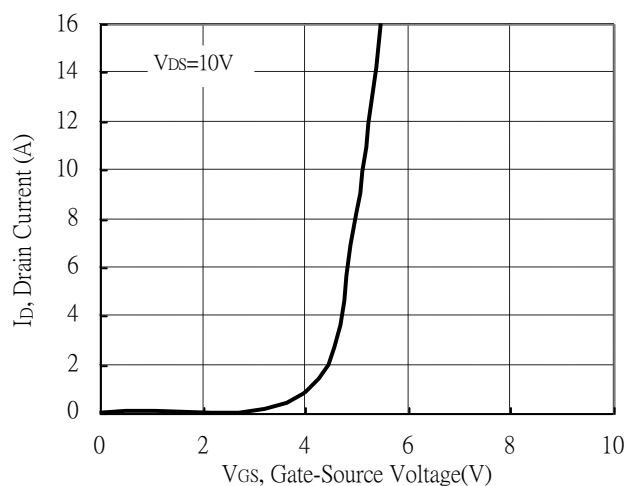


Maximum Drain Current vs Junction Temperature

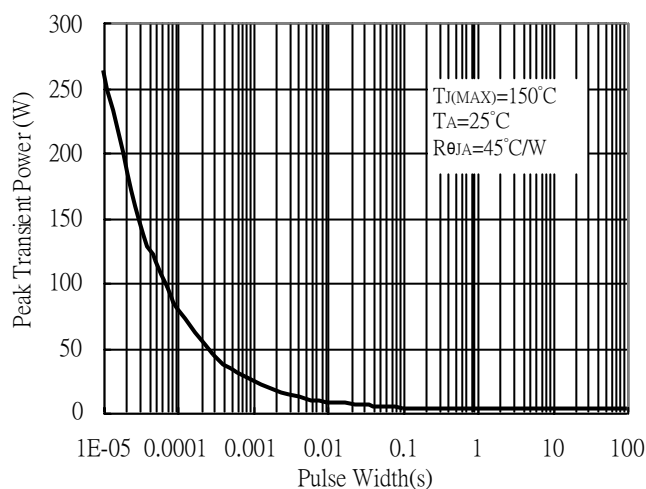


## Typical Characteristics(Cont.)

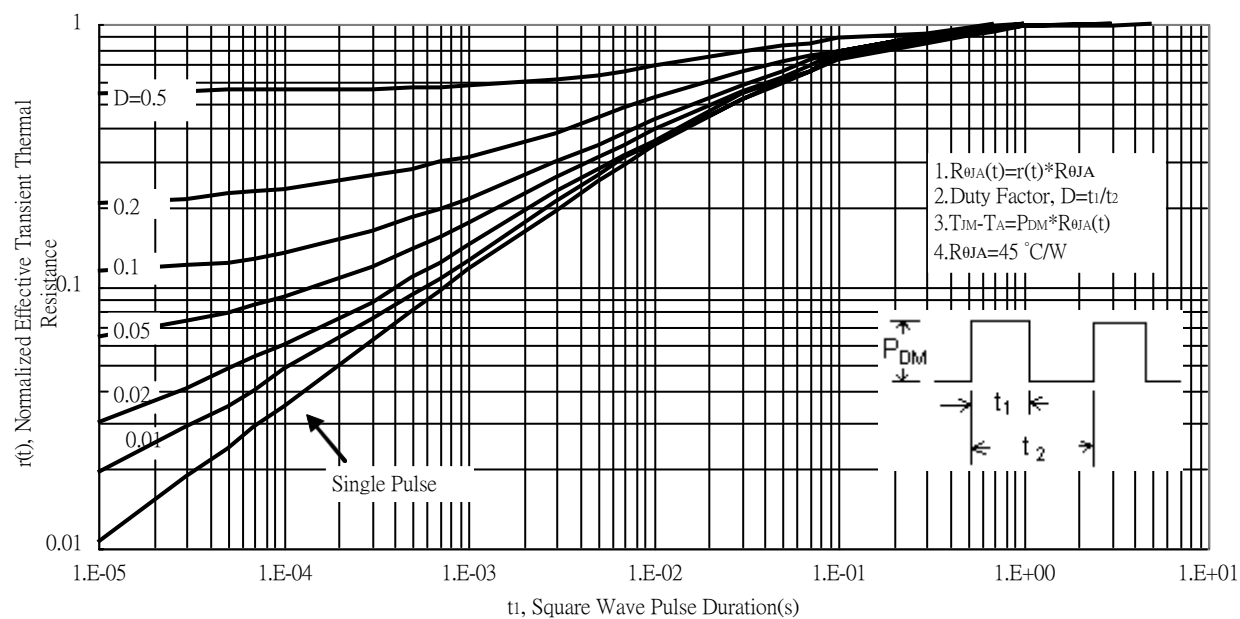
Typical Transfer Characteristics



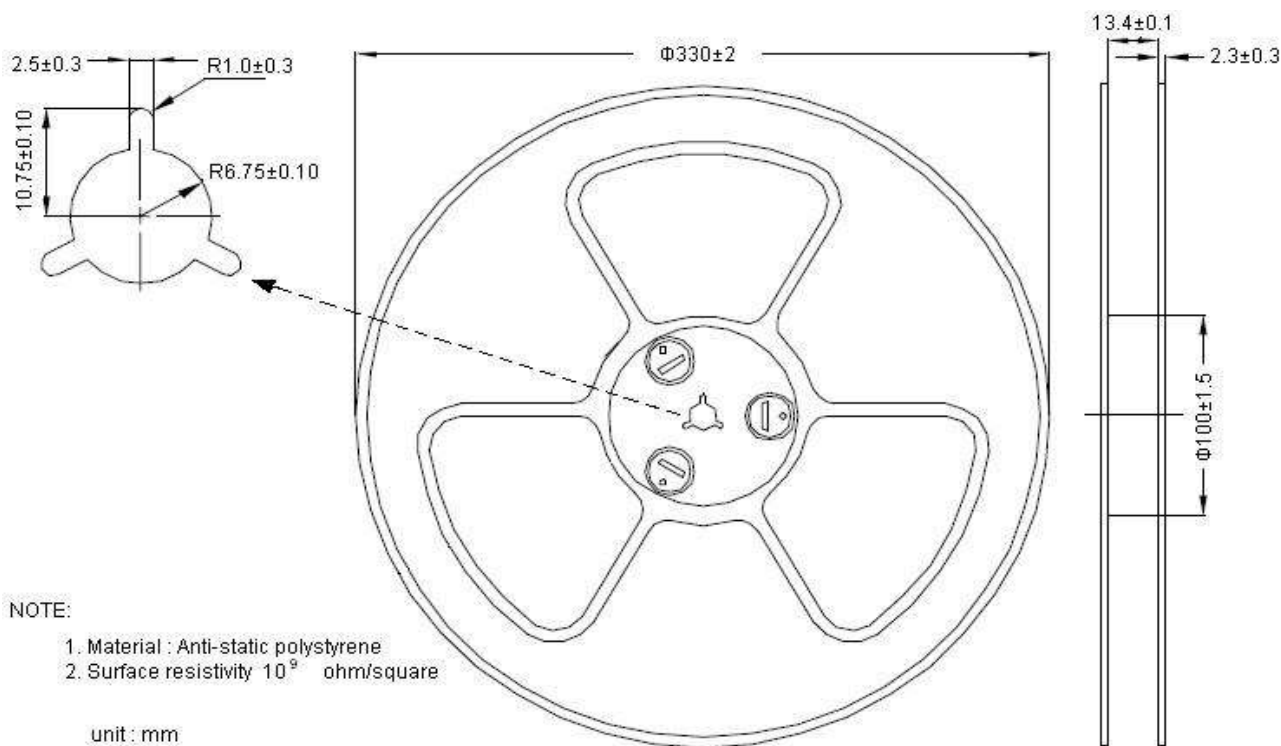
Single Pulse Maximum Power Dissipation



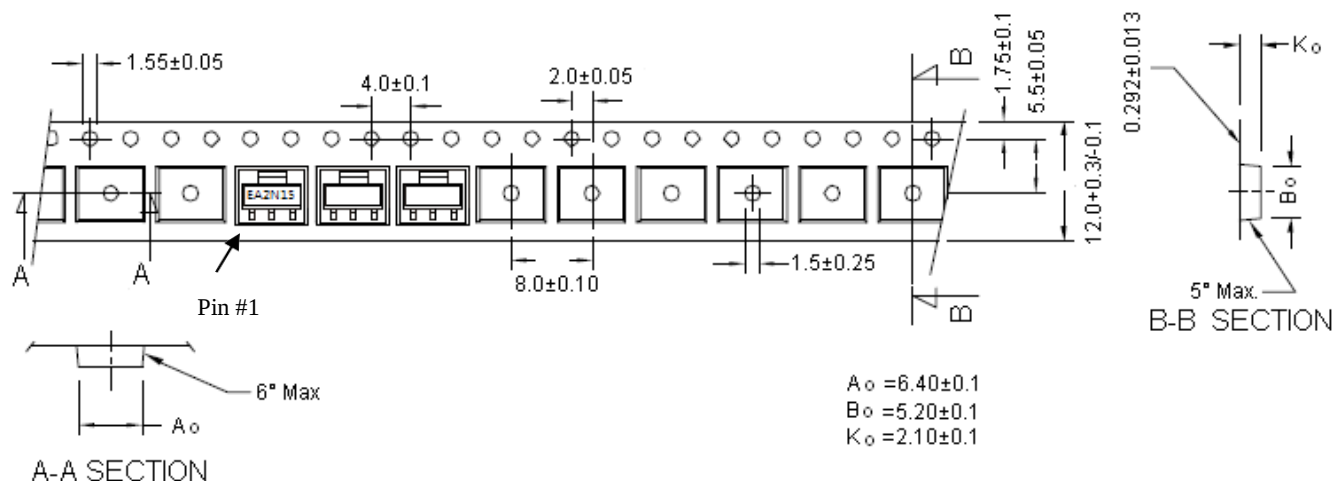
Transient Thermal Response Curves



## Reel Dimension



## Carrier Tape Dimension

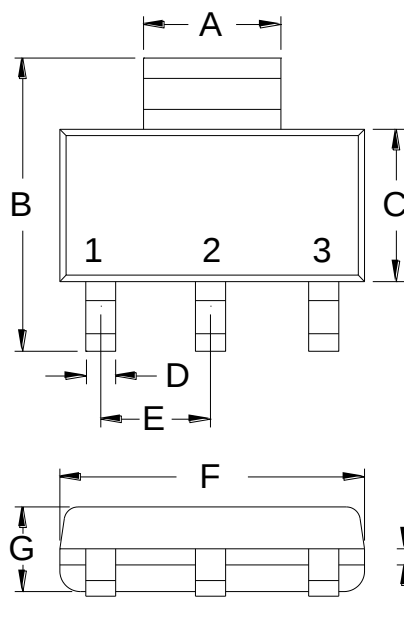


Notes:

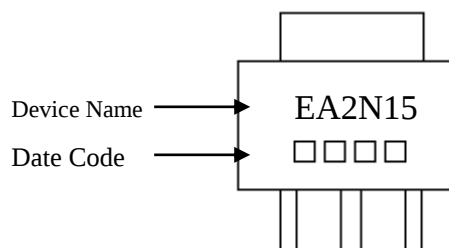
1. 10 sprocket hole pitch cumulative tolerance  $\pm 0.2$ .
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Uni : millimeter

## SOT-223 Dimension



Marking:



Style: Pin 1.Gate 2.Drain 3.Source

3-Lead SOT-223 Plastic  
Surface Mounted Package

Date Code (counting from left to right) :

1<sup>st</sup> code: year code, the last digit of Christian year

2<sup>nd</sup> code : month code, Jan→A, Feb→B, Mar→C, Apr→D, May→E, Jun→F, Jul→G, Aug→H, Sep→J, Oct→K, Nov→L,  
Dec→M

3<sup>rd</sup> and 4<sup>th</sup> codes : production serial number, 01~99

\*: Typical

| DIM | Inches  |        | Millimeters |      | DIM | Inches |        | Millimeters |      |
|-----|---------|--------|-------------|------|-----|--------|--------|-------------|------|
|     | Min.    | Max.   | Min.        | Max. |     | Min.   | Max.   | Min.        | Max. |
| A   | 0.1142  | 0.1220 | 2.90        | 3.10 | G   | 0.0551 | 0.0709 | 1.40        | 1.80 |
| B   | 0.2638  | 0.2874 | 6.70        | 7.30 | H   | 0.0098 | 0.0138 | 0.23        | 0.35 |
| C   | 0.1299  | 0.1457 | 3.30        | 3.70 | I   | 0.0008 | 0.0039 | 0.02        | 0.10 |
| D   | 0.0236  | 0.0315 | 0.60        | 0.80 | a1  | *13°   | -      | *13°        | -    |
| E   | *0.0906 | -      | *2.30       | -    | a2  | 0°     | 10°    | 0°          | 10°  |
| F   | 0.2480  | 0.2638 | 6.30        | 6.70 |     |        |        |             |      |