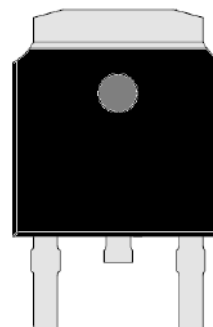


N -Channel Enhancement Mode Power MOSFET

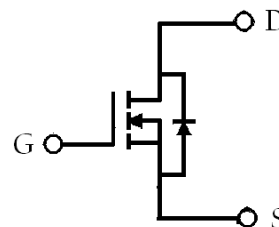
Features:

- Low Gate Charge
- Simple Drive Requirement
- Pb-free lead plating and halogen-free package

TO-252(DPAK)



| | |
|---|-------------------|
| BV_{DSS} | 300V |
| I_D@ V_{GS}=10V, T_C=25°C | 13A |
| R_{DS(ON)}@ V_{GS}=10V, I_D=6A | 249mΩ(typ) |



G : Gate D : Drain S :
Source

Ordering Information

| Device | Package | Shipping |
|---------|---|------------------------|
| KJ12N30 | TO-252 (Pb-free lead plating and halogen-free package) | 2500 pcs / Tape & Reel |

Absolute Maximum Ratings (T_c=25°C, unless otherwise noted)

| Parameter | Symbol | Limits | Unit |
|---|-----------------------------------|----------|------|
| Drain-Source Voltage | V _{DS} | 300 | V |
| Gate-Source Voltage | V _{GS} | ±30 | |
| Continuous Drain Current @ T _c =25°C, V _{GS} =10V | I _D | 13 | A |
| Continuous Drain Current @ T _c =100°C, V _{GS} =10V | | 9.2 | |
| Pulsed Drain Current *1 | I _{DM} | 36 | |
| Avalanche Current @ L=0.1mH | I _{AS} | 5 | |
| Avalanche Energy @ L=10mH, I _{AS} =4A, V _{DD} =30V, V _{GS} =10V *3 | E _{AS} | 80 | mJ |
| Repetitive Avalanche Energy @ L=0.05mH *1, *2 | E _{AR} | 5 | |
| Total Power Dissipation @T _c =25°C | P _D | 150 | W |
| Total Power Dissipation @T _c =100°C | | 75 | |
| Total Power Dissipation @T _A =25°C *4 | | 3 | |
| Total Power Dissipation @T _A =70°C *4 | | 2.1 | |
| Operating Junction and Storage Temperature Range | T _j , T _{stg} | -55~+175 | °C |

Thermal Data

| Parameter | Symbol | Value | Unit |
|---|------------------|-------|------|
| Thermal Resistance, Junction-to-case, max | R _{θJC} | 1 | °C/W |
| Thermal Resistance, Junction-to-ambient, max *4 | R _{θJA} | 50 | |
| Thermal Resistance, Junction-to-ambient, max | | 110 | |

- Note : *1. Pulse width limited by maximum junction temperature
 *2. Duty cycle ≤ 1%
 *3. 100% tested by conditions of L=10mH, I_{AS}=2A, V_{GS}=10V, V_{DD}=30V
 *4. Surface mounted on 1 in²copper pad of FR-4 board

Characteristics (T_c=25°C, unless otherwise specified)

| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|-------------------------------------|------|------|------|------|---|
| Static | | | | | |
| BV _{DSS} | 300 | - | - | V | V _{GS} =0V, I _D =250μA |
| ΔBV _{DSS} /ΔT _j | - | 0.3 | - | V/°C | Reference to 25°C, I _D =250μA |
| V _{GS(th)} | 2.3 | - | 4.5 | V | V _{DS} =V _{GS} , I _D =250μA |
| G _{FS} *1 | - | 4.6 | - | S | V _{DS} =40V, I _D =5A |
| I _{GSS} | - | - | ±100 | nA | V _{GS} =±30V, V _{DS} =0V |
| I _{DSS} | - | - | 1 | μA | V _{DS} =240V, V _{GS} =0V |
| | - | - | 25 | | V _{DS} =240V, V _{GS} =0V, T _j =125°C |
| R _{DS(ON)} *1 | - | 249 | 330 | mΩ | V _{GS} =10V, I _D =6A |
| Dynamic | | | | | |
| Q _g *1, 2 | - | 24.3 | - | nC | I _D =12A, V _{DS} =240V, V _{GS} =10V |
| Q _{gs} *1, 2 | - | 5.7 | - | | |
| Q _{gd} *1, 2 | - | 10.1 | - | | |

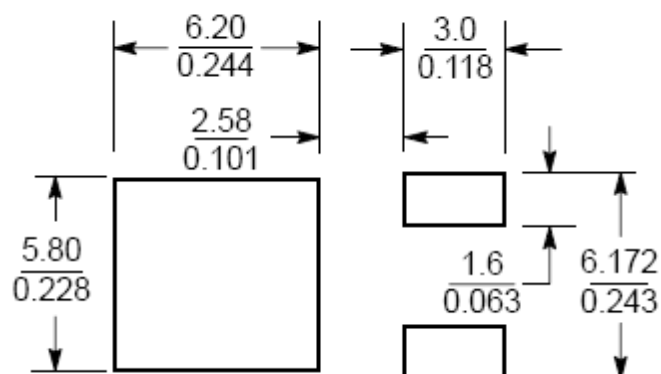
| | | | | | |
|---------------------------|---|------|-----|----------|--|
| $t_{d(ON)}$ *1, 2 | - | 15.2 | - | ns | $V_{DS}=150V, I_D=12A, V_{GS}=10V, R_G=25\Omega$ |
| t_r *1, 2 | - | 46.2 | - | | |
| $t_{d(OFF)}$ *1, 2 | - | 39.2 | - | | |
| t_f *1, 2 | - | 59.6 | - | | |
| C_{iss} | - | 1016 | - | pF | $V_{GS}=0V, V_{DS}=30V, f=1MHz$ |
| C_{oss} | - | 82 | - | | |
| C_{rss} | - | 45 | - | | |
| R_g | - | 1.4 | - | Ω | $f=1MHz$ |
| Source-Drain Diode | | | | | |
| I_s *1 | - | - | 9 | A | |
| I_{SM} *3 | - | - | 36 | | |
| V_{SD} *1 | - | 0.73 | 1.2 | V | $I_s=1A, V_{GS}=0V$ |
| t_{rr} | - | 121 | - | ns | $I_F=12A, dI_F/dt=100A/\mu s$ |
| Q_{rr} | - | 490 | - | nC | |

Note : *1.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

*2.Independent of operating temperature

*3.Pulse width limited by maximum junction temperature.

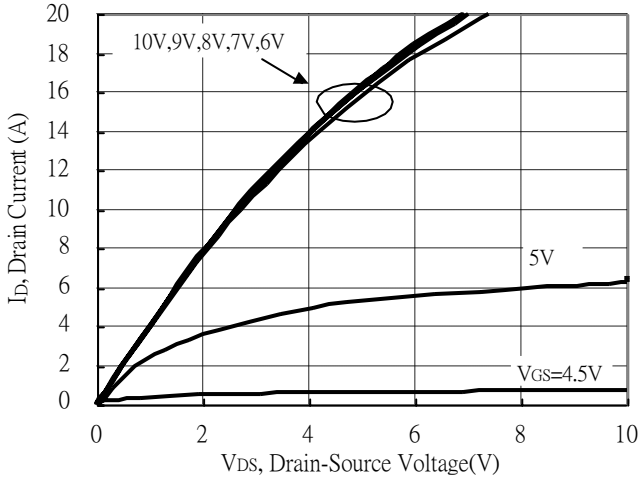
Recommended soldering footprint



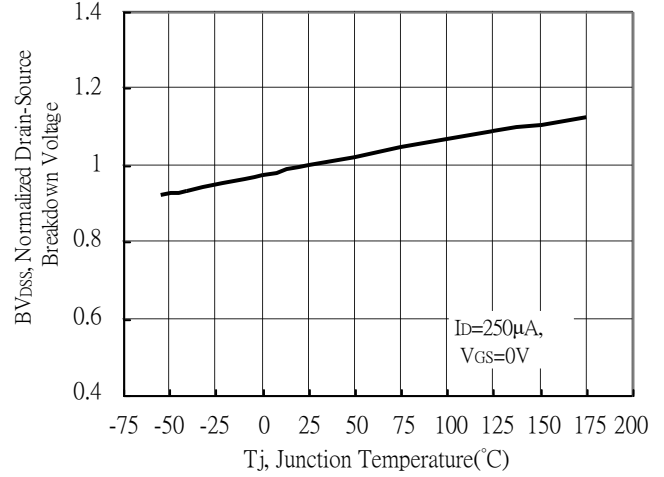
Unit ($\frac{mm}{inch}$)

Typical Characteristics

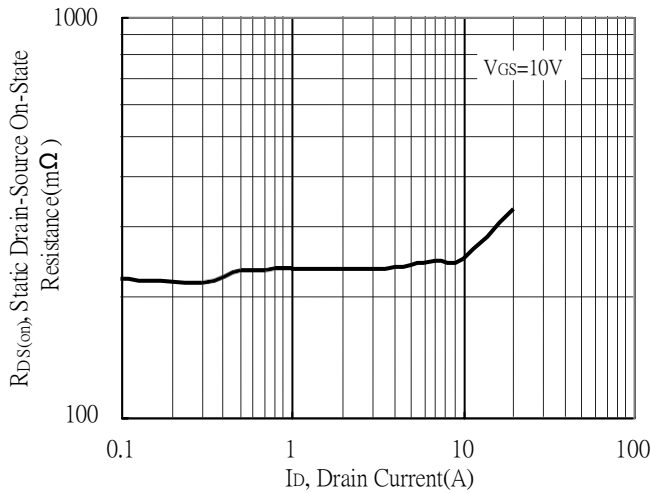
Typical Output Characteristics



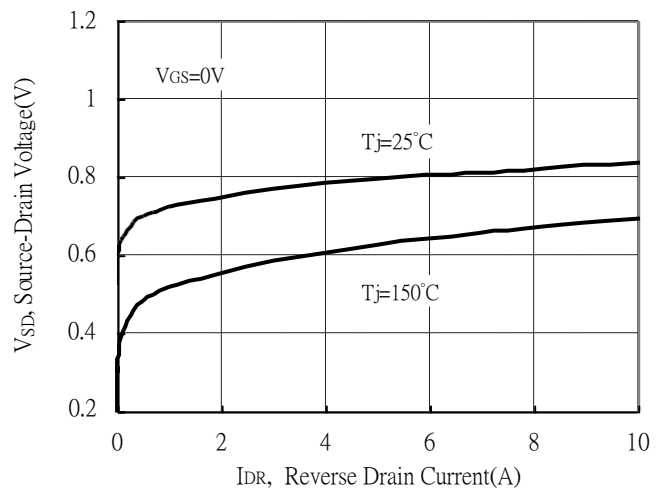
Brekdown Voltage vs Ambient Temperature



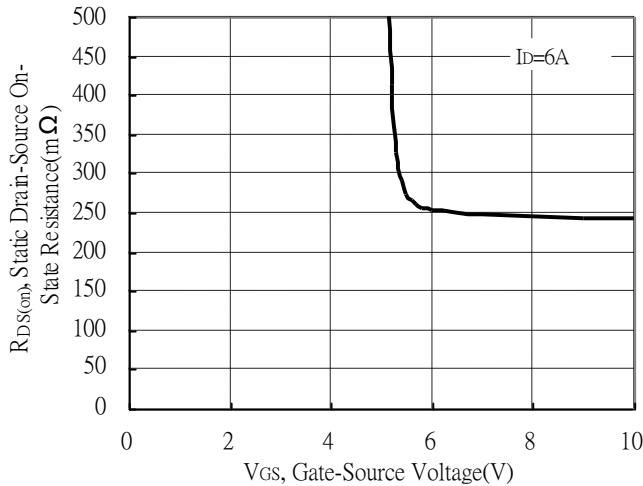
Static Drain-Source On-State resistance vs Drain Current



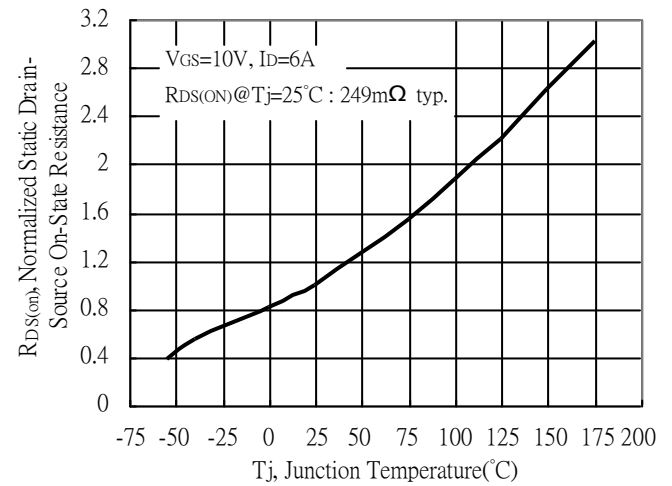
Reverse Drain Current vs Source-Drain Voltage



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

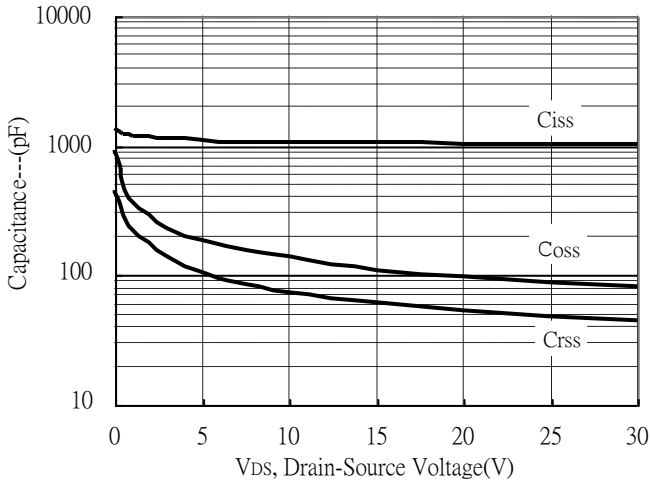


Drain-Source On-State Resistance vs Junction Temperature

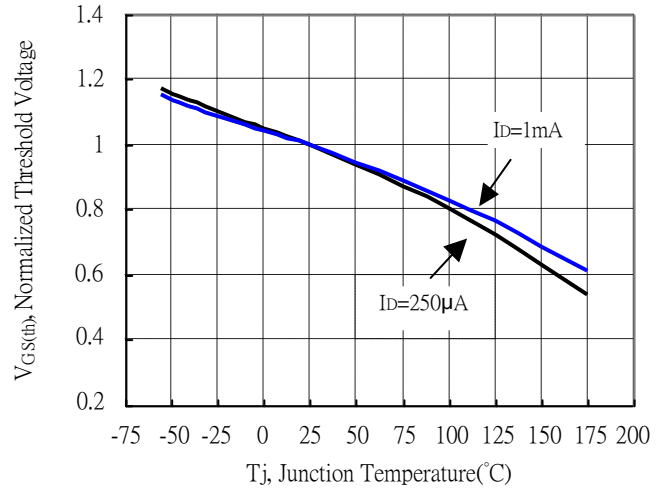


Typical Characteristics(Cont.)

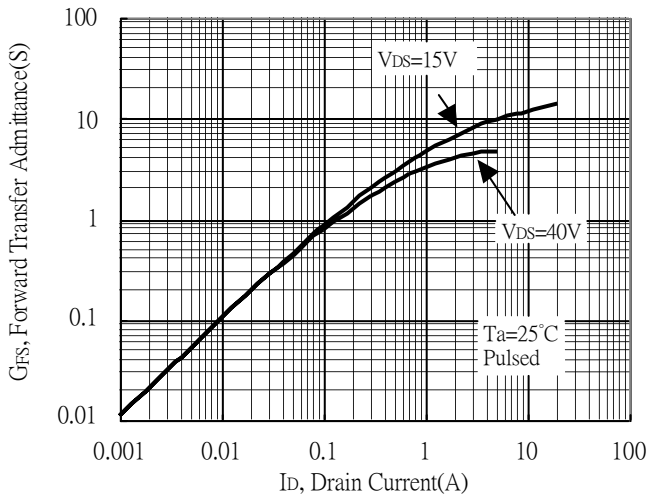
Capacitance vs Drain-to-Source Voltage



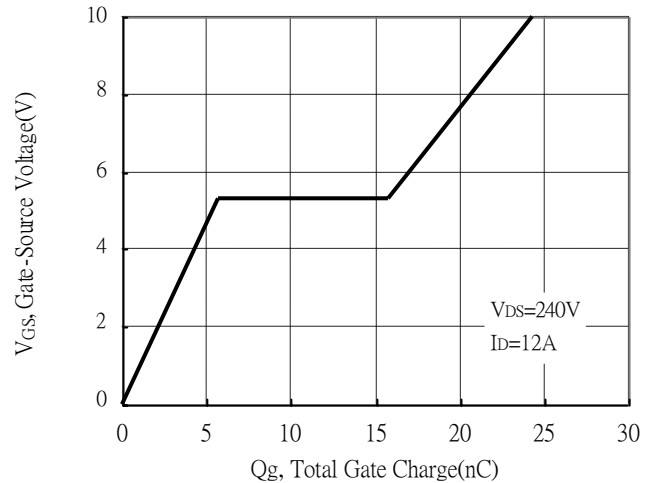
Threshold Voltage vs Junction Temperature



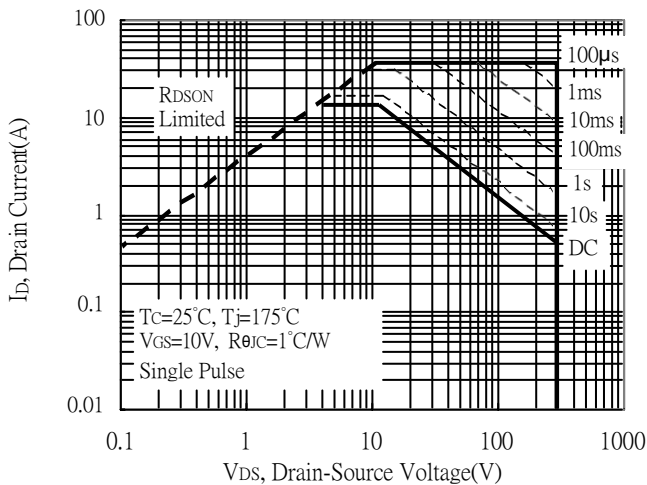
Forward Transfer Admittance vs Drain Current



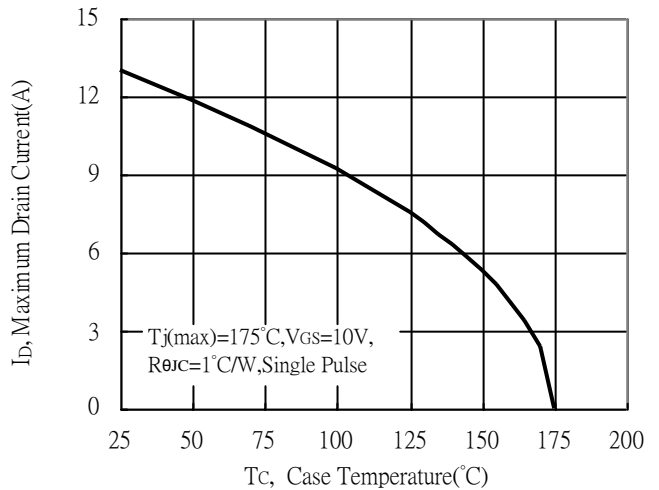
Gate Charge Characteristics



Maximum Safe Operating Area

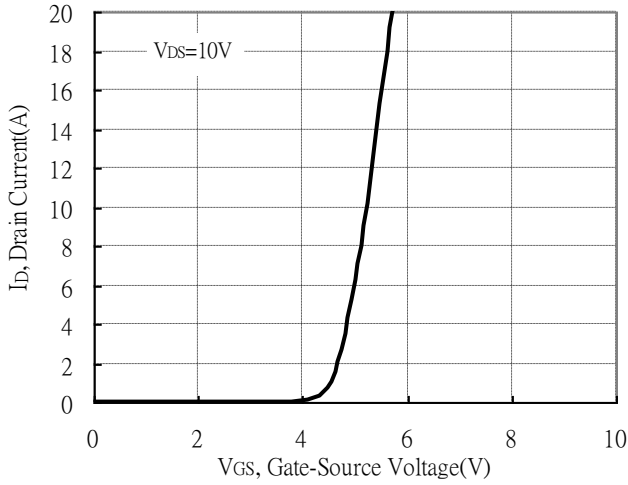


Maximum Drain Current vs Case Temperature

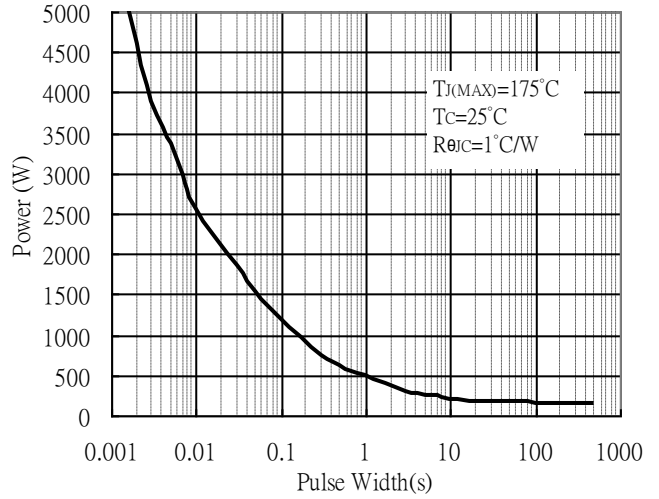


Typical Characteristics(Cont.)

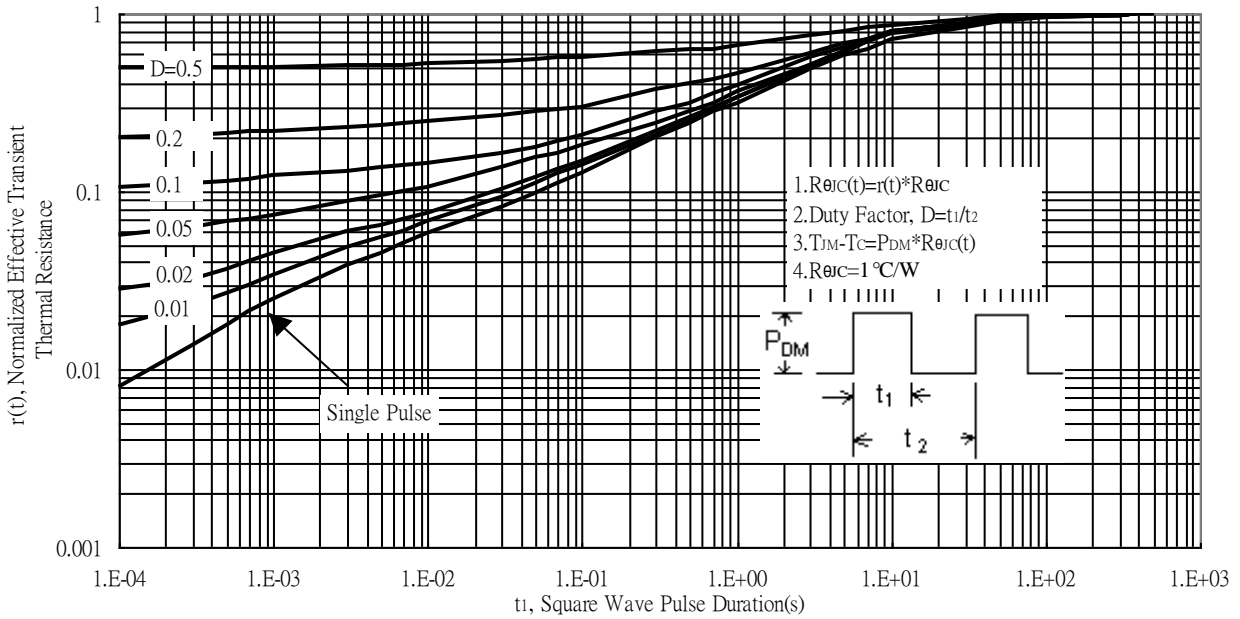
Typical Transfer Characteristics



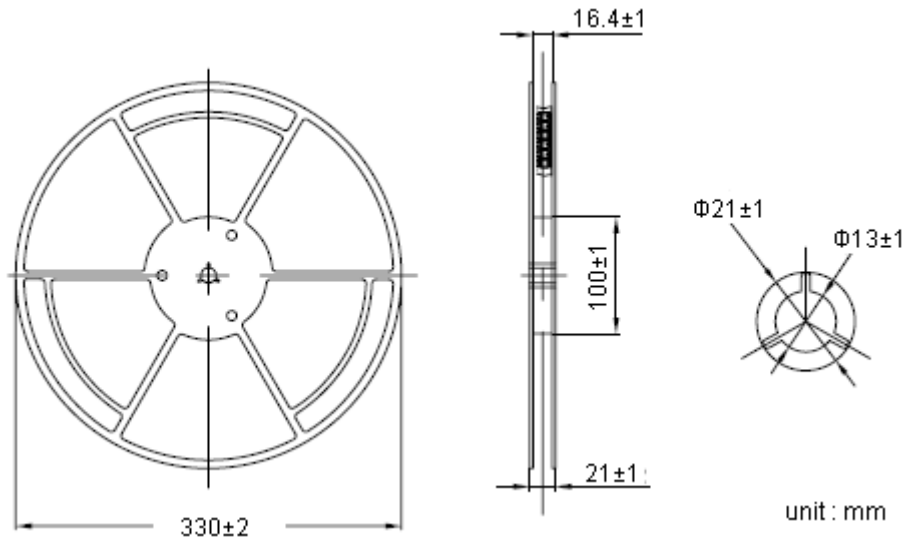
Single Pulse Power Rating, Junction to Case



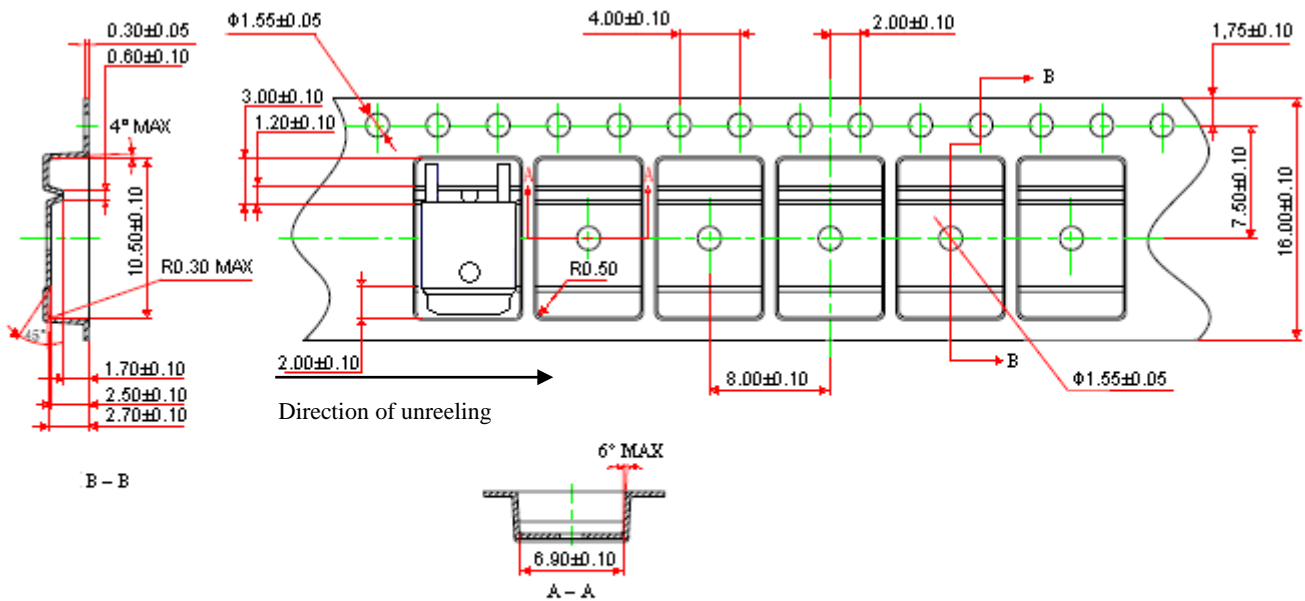
Transient Thermal Response Curves



Reel Dimension



Carrier Tape Dimension

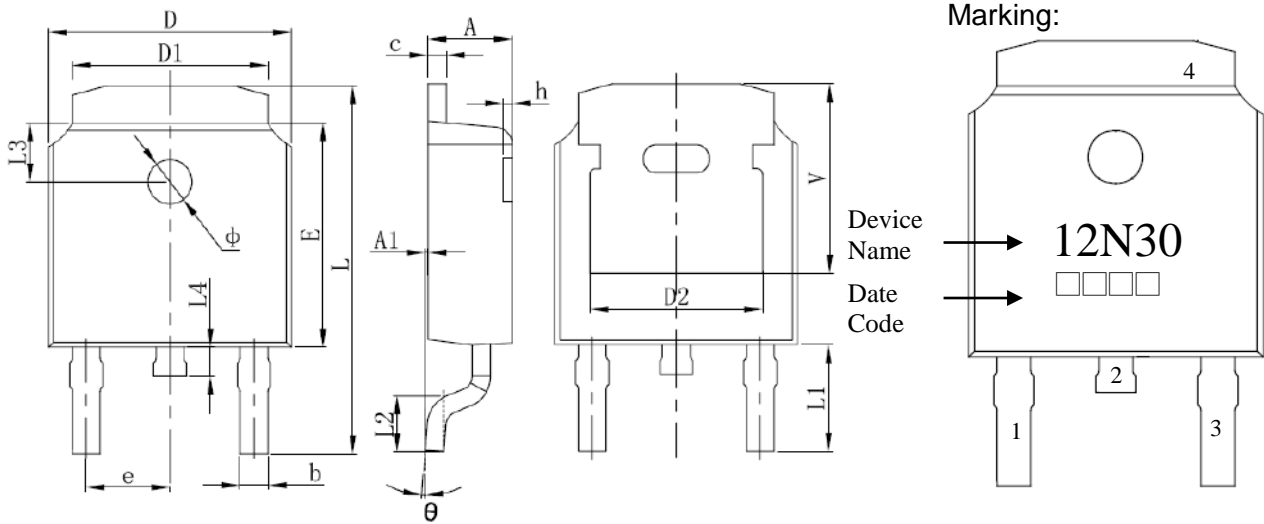


Notes:

1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene, antistatic coated : $10^5 \Omega/\square \sim 10^{11} \Omega/\square$

unit : mm

TO-252 Dimension



3-Lead TO-252 Plastic Surface Mount Package

Style: Pin 1.Gate 2.Drain 3.Source 4.Drain

| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|-----|--------|-------|-------------|-------|-----|--------|-------|-------------|--------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.087 | 0.094 | 2.200 | 2.400 | L | 0.382 | 0.406 | 9.712 | 10.312 |
| A1 | 0.000 | 0.005 | 0.000 | 0.127 | L1 | 0.114 | REF | 2.900 | REF |
| b | 0.025 | 0.030 | 0.635 | 0.770 | L2 | 0.055 | 0.067 | 1.400 | 1.700 |
| c | 0.018 | 0.023 | 0.460 | 0.580 | L3 | 0.063 | REF | 1.600 | REF |
| D | 0.256 | 0.264 | 6.500 | 6.700 | L4 | 0.024 | 0.039 | 0.600 | 1.000 |
| D1 | 0.201 | 0.215 | 5.100 | 5.460 | Φ | 0.043 | 0.051 | 1.100 | 1.300 |
| D2 | 0.190 | REF | 4.830 | REF | θ | 0° | 8° | 0° | 8° |
| E | 0.236 | 0.244 | 6.000 | 6.200 | h | 0.000 | 0.012 | 0.000 | 0.300 |
| e | 0.086 | 0.094 | 2.186 | 2.386 | v | 0.207 | REF | 5.250 | REF |