## "Yت / Descriptions

TO-251 N MOS N-CHANNEL MOSFET in a TO-251 Plastic Package.

## ◕ È / Features

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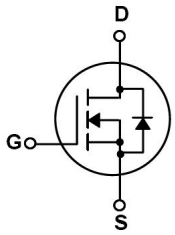
Low gate charge, low crss, fast switching.

## ४ ي / Applications

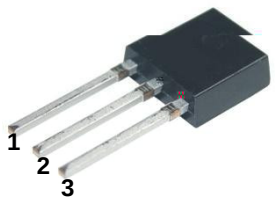
DC/DC

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies.

## Л ڤ ڳ ٭ ع / Equivalent Circuit




## ã ⅄ ʊ̃ / Pinning




PIN1 G PIN 2 D PIN 3 S

## ڳ ⅋ z Łˌ ʜ ɔ̇ / $h_{FE}$ Classifications & Marking

See Marking Instructions.

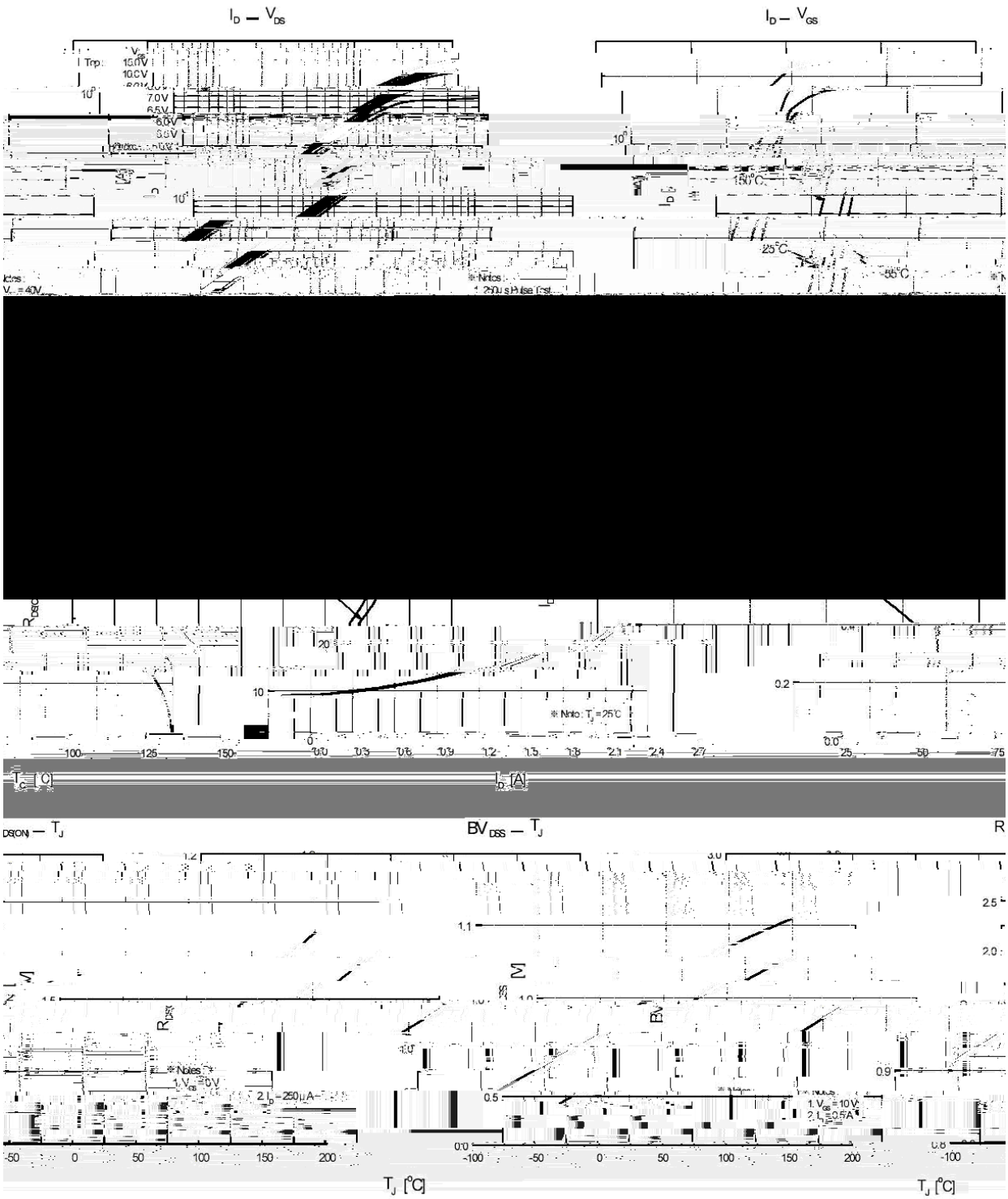
## ώ ۀ Ξ Ặ / Absolute Maximum Ratings(Ta=25 ﻝ)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | 600 | V |
| Drain Current | $I_D$(Tc=25 ) | 1.0 | A |
| Drain Current | $I_D$(Tc=100 ) | 0.6 | A |
| Drain Current - Pulsed | $I_{DM}$ | 3.0 | A |
| Gate-Source Voltage | $V_{GSS}$ | ±30 | V |
| Single Pulsed Avalanche Energy | $E_{AS}$ | 50 | mJ |
| Repetitive Avalanche Energy | $E_{AR}$ | 2.8 | mJ |
| Avalanche Current | $I_{AR}$ | 1.0 | A |
| Power Dissipation | $P_D$(Tc=25 ) | 30 | W |
| Operating and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 to 150 | |

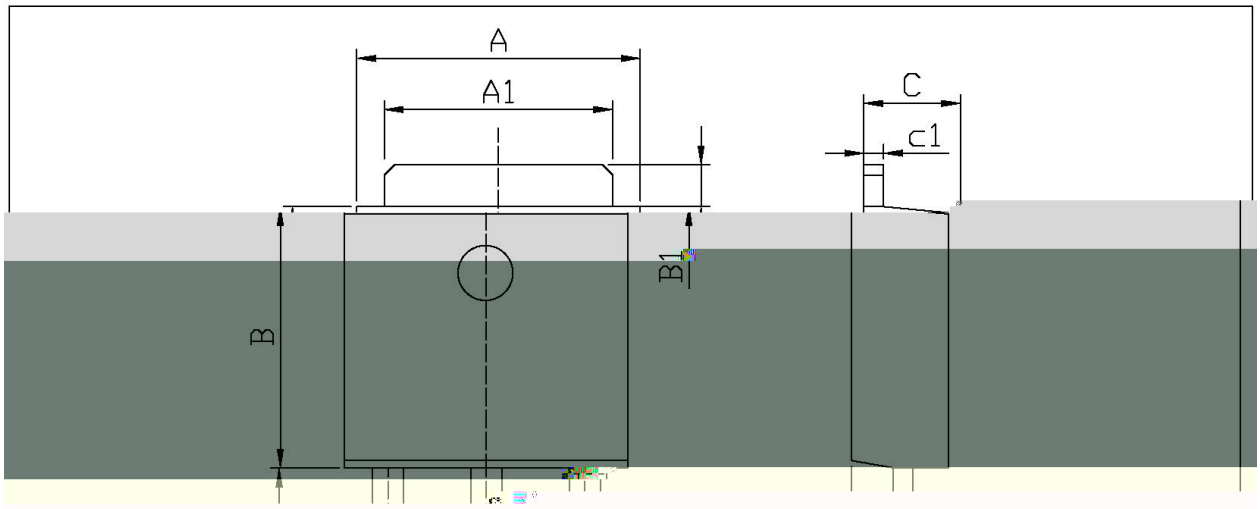
## ≠ ﾊ Ξ Ặ / Electrical Characteristics(Ta=25 ﻝ)

| Parameter | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V | $I_D$=250μA | 600 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=600V | $V_{GS}$=0V | | | 10 | μA |
| | | $V_{DS}$=480V | $T_C$=125 | | | 100 | μA |
| Gate-Body Leakage Current, Forward | $I_{GSS}$ | $V_{GS}$=±30V | $V_{DS}$=0V | | | ±0.1 | μA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ | $I_D$=250μA | 2.0 | | 4.0 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=10V | $I_D$=0.5A | | 9.7 | 12 | Ω |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=40V | $I_D$=0.5A | | 0.97 | | S |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V | $I_S$=1.0A | | | 1.4 | V |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V f=1.0MHz | $V_{GS}$=0V | | 155 | 200 | pF |
| Output Capacitance | $C_{oss}$ | | | | 20 | 26 | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | | 3.0 | 4.0 | pF |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$=300V $R_G$=50Ω | $I_D$=1.2A | | 10 | 30 | ns |
| Turn-On Rise Time | $t_r$ | | | | 20 | 50 | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | | | 16 | 45 | ns |
| Turn-Off Fall Time | $t_f$ | | | | 25 | 60 | ns |

## ƒ Ã ´E ¼ ƒ / Electrical Characteristic Curve



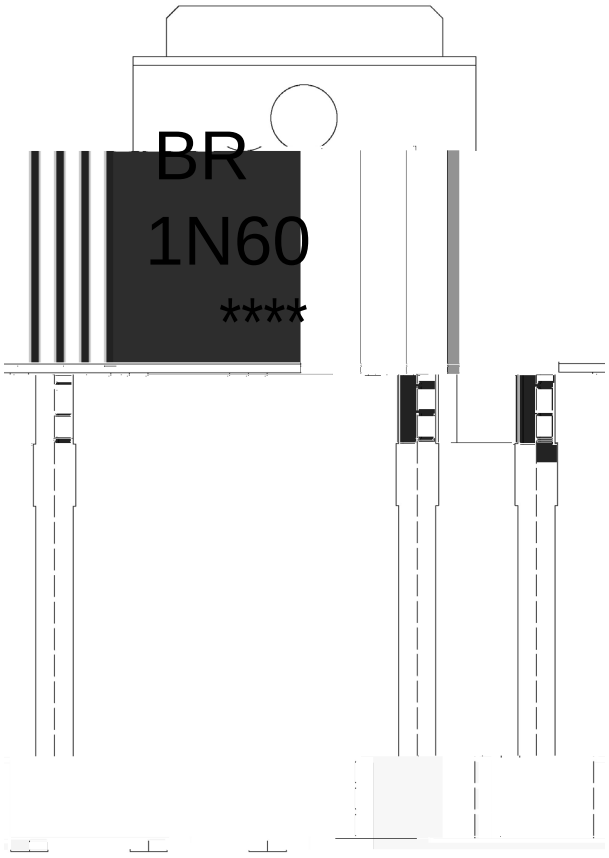
## ᵘ ĖÒĻ ʃ / Package Dimensions




| Symbol | Min | Max |
|---|---|---|
| a | 0.50 | 0.70 |
| b | 9.00 | 9.40 |

| | Min | Max |
|---|---|---|
| A | 6.45 | 6.75 |
| A1 | 5.10 | 5.50 |

## Ł. L Ω / Marking Instructions




BR

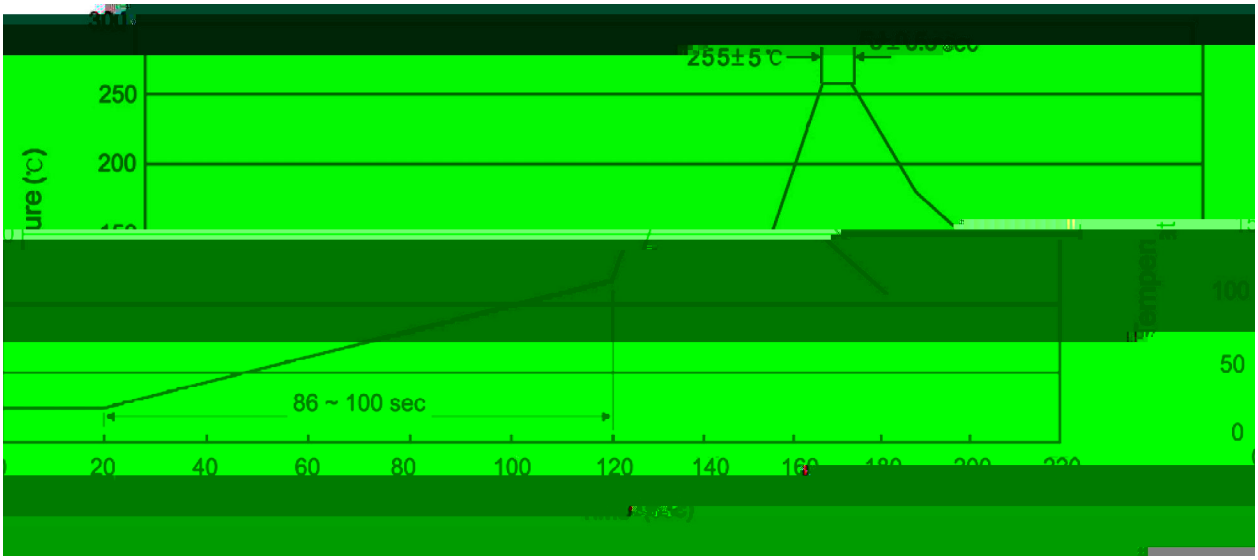
1N60

****

Note:

| | |
|---|---|
| BR: | Company Code |
| 1N60: | Product Type. |
| ****: | Lot No. Code, code change with Lot No. |

## ↓ ṣ ╗ ẘ´E ⅵ ƒ (ᾠ̌ ᴗ) / Temperature Profile for Dip Soldering(Pb-Free)




| | | | | |
|---|---|---|---|---|
| 1 | 25 150 | 60 | 90sec; | Note: 1.Preheating:25~150 , Time:60~90sec. |
| 2 | 255±5 | | 5±0.5sec; | 2.Peak Temp.:255±5 , Duration:5±0.5sec. |
| 3 | | 2 10 | /sec. | 3. Cooling Speed: 2~10 /sec. |

## ⅃ ǖ ɑ ˝ ˋY Ţ / Resistance to Soldering Heat Test Conditions

| | | | |
|---|---|---|---|
| 270±5 | 10±1 sec. | Temp.:270±5 | Time:10±1 sec |

## ɒ ᴇ ᴄ— / Packaging SPEC.

/ BULK

| Package Type 封装形式 | Units 包装数量 | | | | | Dimension 包装尺寸 (unit: $mm^3$) | | |
|---|---|---|---|---|---|---|---|---|
| | Units/Bag 只/袋 | Bags/Inner Box 袋/盒 | Units/Inner Box 只/盒 | Inner Boxes/Outer Box 盒/箱 | Units/Outer Box 只/箱 | Bag 袋 | Inner Box 盒 | Outer Box 箱 |
| TO-251 | 1,000 | 10 | 10,000 | 5 | 50,000 | 135×190 | 237×172×102 | 560×245×195 |

/ TUBE

| Package Type 封装形式 | Units 包装数量 | Dimension 包装尺寸 (unit: $mm^3$) |
|---|---|---|
| | Units/Tube 只/套管 | |