



H2N7002SN

N-Channel MOSFET (60V, 0.2A)

Description

N-channel enhancement-mode MOS transistor.

Absolute Maximum Ratings

| | |
|---|---------------|
| Drain-Source Voltage | 60 V |
| Drain-Gate Voltage ($R_{GS}=1M\Omega$) | 60 V |
| Gate-Source Voltage | ± 20 V |
| Continuous Drain Current ($T_A=25^\circ C$) ⁽¹⁾ | 200 mA |
| Continuous Drain Current ($T_A=100^\circ C$) ⁽¹⁾ | 115 mA |
| Pulsed Drain Current ($T_A=25^\circ C$) ⁽²⁾ | 800 mA |
| Total Power Dissipation ($T_C=25^\circ C$) | 200 mW |
| Derate above 25°C | 0.16 mW / °C |
| Storage Temperature | -55 to 150 °C |
| Operating Junction Temperature | -55 to 150 °C |
| Lead Temperature, for 10 second Soldering | 260 °C |

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient..... 625 °C / W

Electrical Characteristics ($T_A=25^\circ C$)

| Parameter | Symbol | Test Conditions | Min | Typ. | Max | Unit |
|---|--------------|---|-----|------|-------|----------|
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0, I_D=10\mu A$ | 60 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=2.5V, I_D=0.25mA$ | 1 | - | 2.5 | V |
| Gate Source Leakage Current, Forward | $I_{GSS/F}$ | $V_{GS}=+20V, V_{DS}=0$ | - | - | 100 | nA |
| Gate Source leakage Current, Reverse | $I_{GSS/R}$ | $V_{GS}=-20V, V_{DS}=0$ | - | - | -100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=60V, V_{GS}=0$ | - | - | 1 | μA |
| On-State Drain Current | $I_{D(ON)}$ | $V_{DS}>2V_{DS(ON)}, V_{GS}=10V$ | 500 | - | - | mA |
| Static Drain-Source On-State Voltage | $V_{DS(ON)}$ | $I_D=50mA, V_{GS}=5V$ | - | - | 0.375 | V |
| | | $I_D=500mA, V_{GS}=10V$ | - | - | 3.75 | V |
| Static Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=4.5V, I_D=75mA$ | - | 3.3 | 5.3 | Ω |
| | | $V_{GS}=5V, I_D=50mA$ | - | 2.8 | 5 | Ω |
| | | $V_{GS}=10V, I_D=500mA$ | - | 2.3 | 5 | Ω |
| Forward Transconductance | G_{FS} | $V_{DS}>2V_{DS(ON)}, I_D=200mA$ | 80 | - | - | mS |
| Turn-on Delay Time | $t_{d(on)}$ | $(V_{DD}=50V, R_D=250\Omega, V_{GS}=10V, R_G=50\Omega)$ | - | 20 | - | nS |
| Turn-off Delay Time | $t_{d(off)}$ | | - | 40 | - | nS |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0, f=1MHz$ | - | - | 50 | pF |
| Output Capacitance | C_{oss} | | - | - | 25 | pF |
| Reverse Transfer Capacitance | C_{rss} | | - | - | 5 | pF |

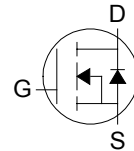
(1)The Power Dissipation of the package may result in a continuous drain current.

(2)Pulse Width \leq 300 μ s, Duty cycle \geq 2%.

H2N7002SN Pin Assignment & Symbol

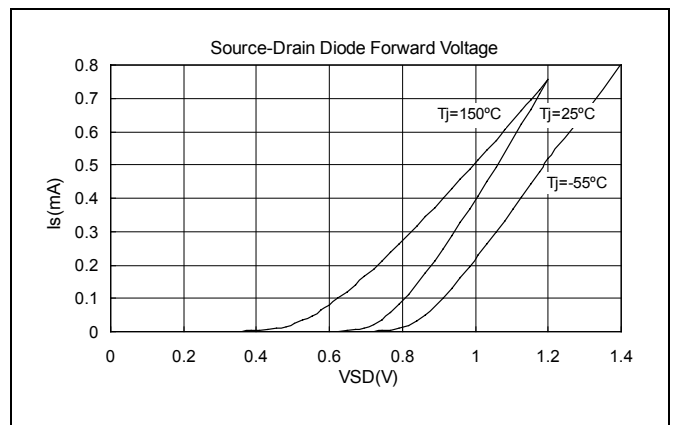
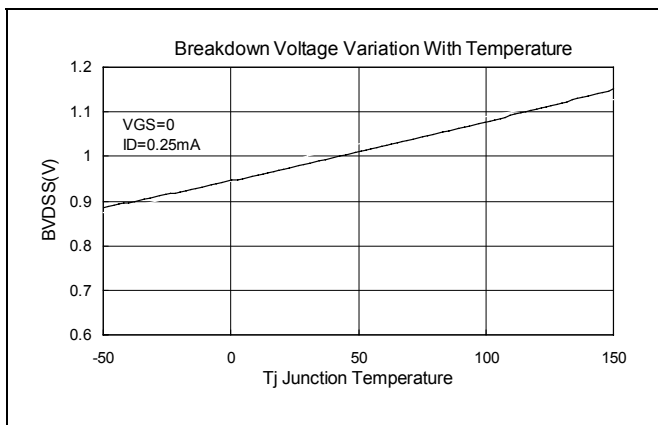
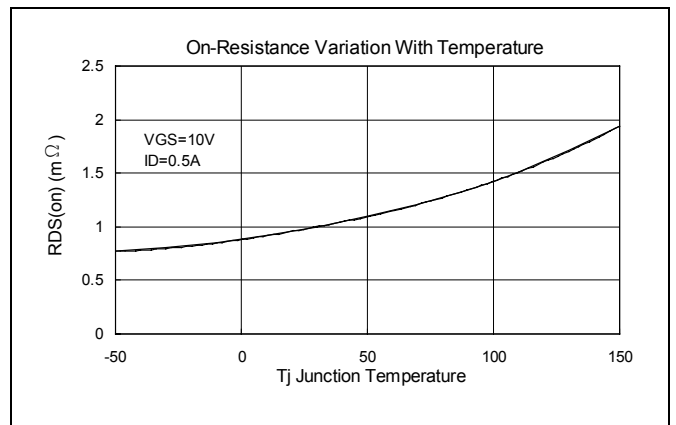
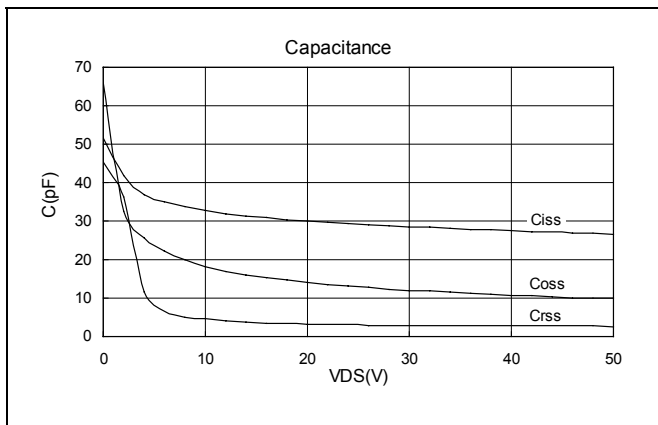
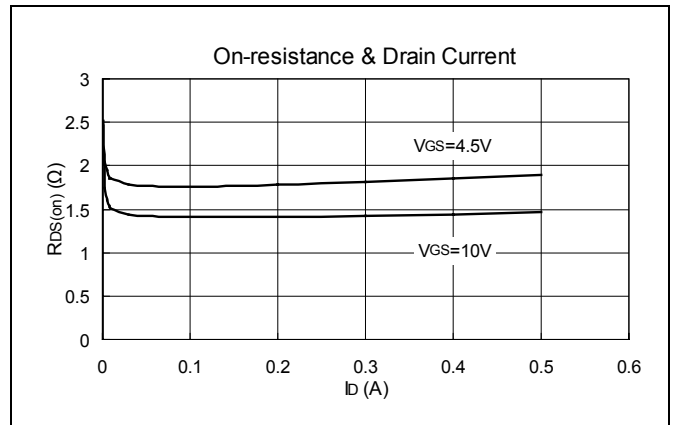
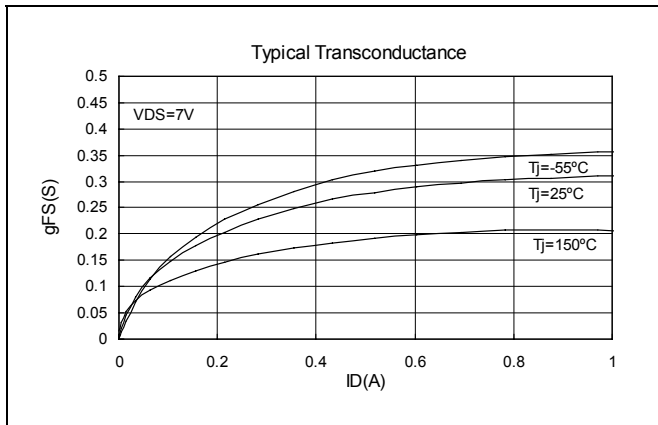
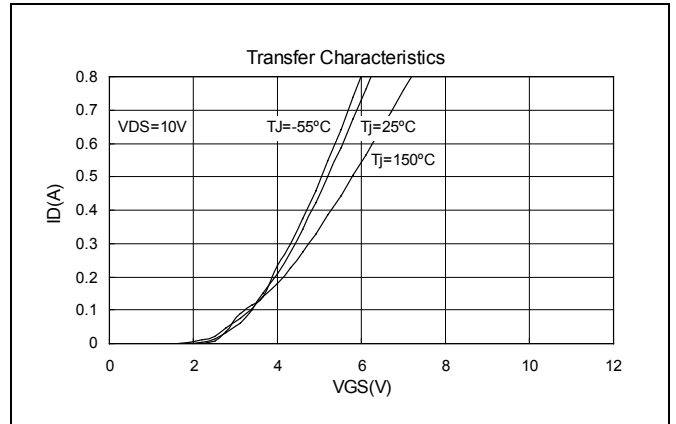
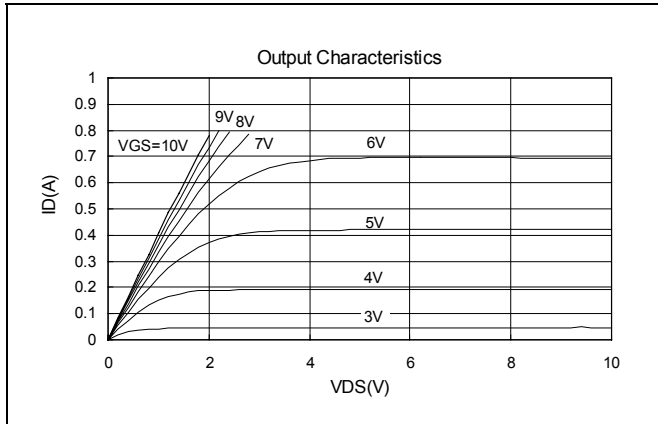


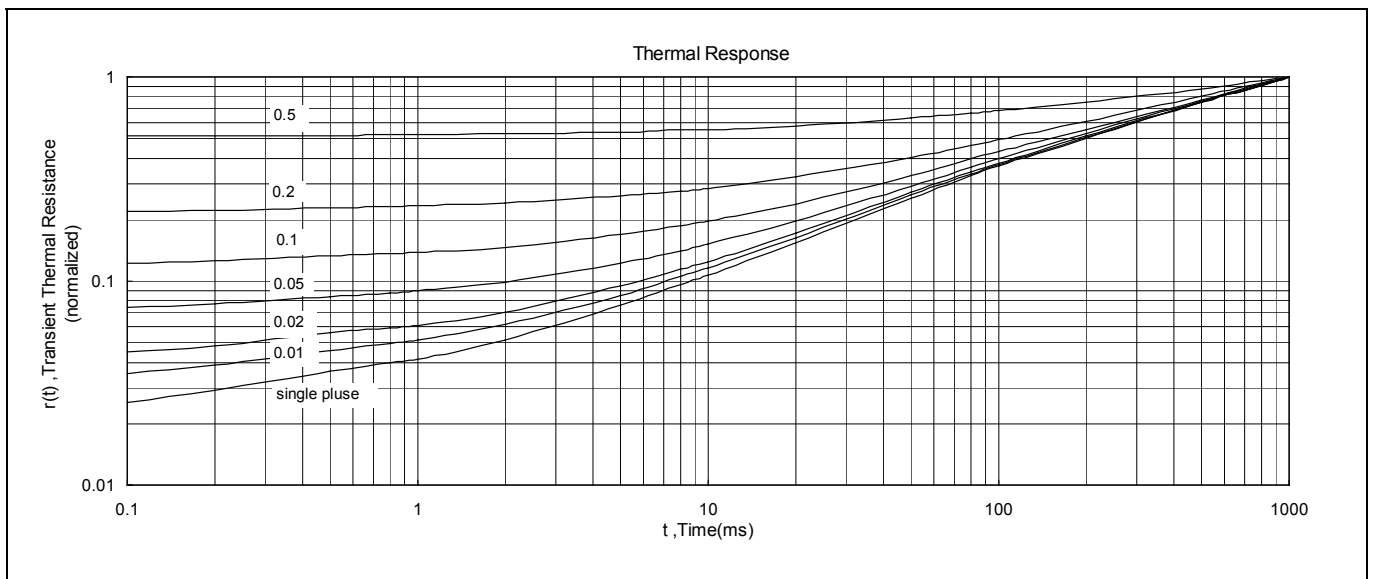
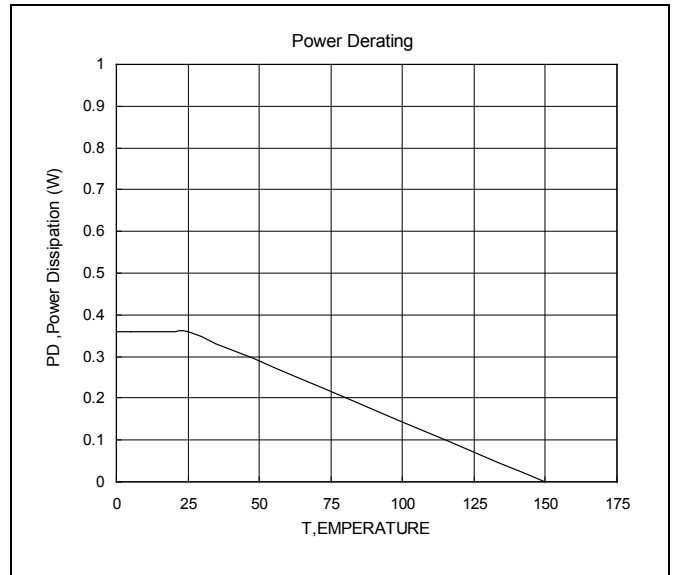
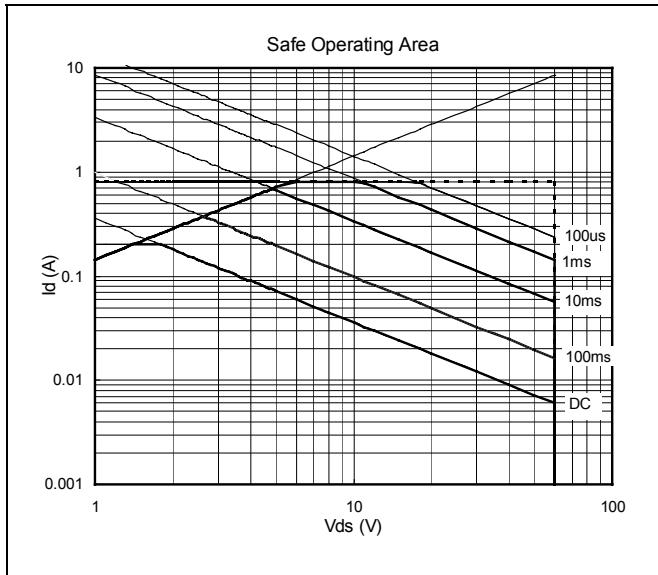
3-Lead Plastic **SOT-323**
Package Code: SN
Pin 1: Gate 2: Source 3: Drain





Characteristics Curve







SOT-323(SC-70) Dimension

3-Lead SOT-323 Plastic
Surface Mounted Package
HSMC Package Code: SN

Marking:

Pb Free Mark
Pb-Free: * (Note)
Normal: None

Note: Pb-free product can distinguish by the green label or the extra description on the right side of the label.

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

Material:

- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

| DIM | Min. | Max. |
|-----|------|------|
| A | 0.80 | 1.10 |
| A1 | 0.00 | 0.10 |
| bp | 0.30 | 0.40 |
| C | 0.10 | 0.25 |
| D | 1.80 | 2.20 |
| E | 1.15 | 1.35 |
| e | 1.3 | - |
| e1 | 0.65 | - |
| He | 2.00 | 2.25 |
| Lp | 0.15 | 0.45 |
| Q | 0.13 | 0.23 |
| v | 0.2 | - |
| w | 0.2 | - |
| θ | 10° | 0° |

*: Typical, Unit: mm

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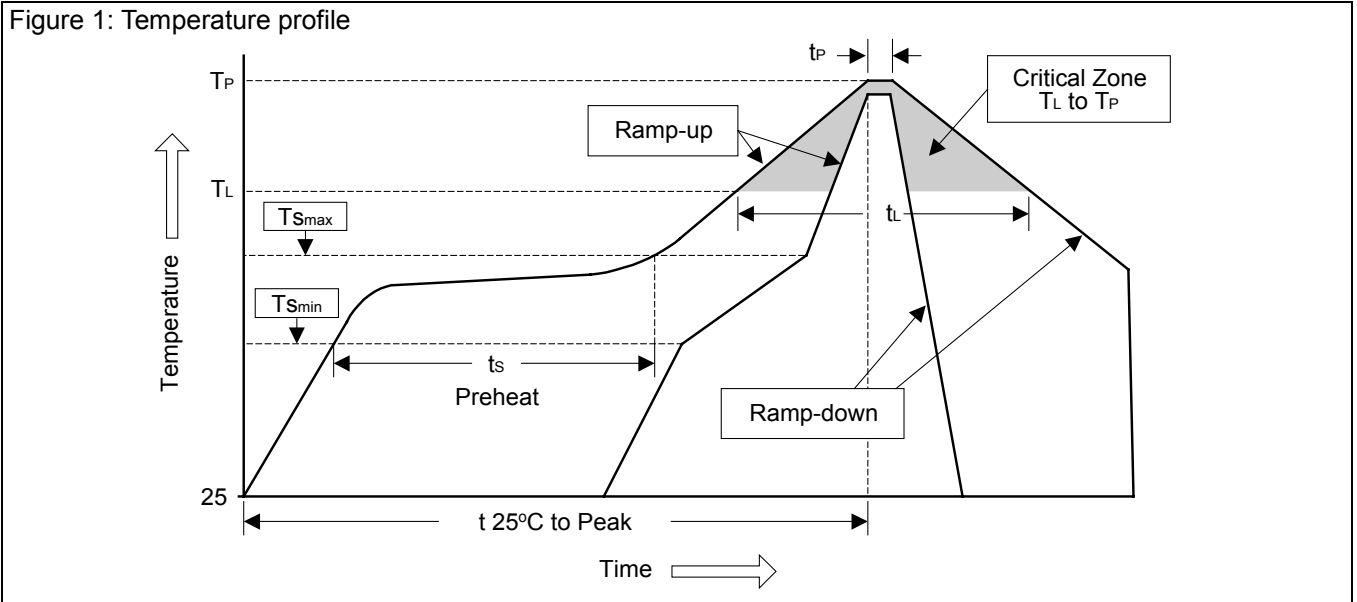
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Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices



| Profile Feature | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|--|-------------------------|------------------|
| Average ramp-up rate (T_L to T_P) | <3°C/sec | <3°C/sec |
| Preheat | | |
| - Temperature Min (T_{smin}) | 100°C | 150°C |
| - Temperature Max (T_{smax}) | 150°C | 200°C |
| - Time (min to max) (t_s) | 60~120 sec | 60~180 sec |
| T_{smax} to T_L | | |
| - Ramp-up Rate | <3°C/sec | <3°C/sec |
| Time maintained above: | | |
| - Temperature (T_L) | 183°C | 217°C |
| - Time (t_L) | 60~150 sec | 60~150 sec |
| Peak Temperature (T_P) | 240°C +0/-5°C | 260°C +0/-5°C |
| Time within 5°C of actual Peak Temperature (t_p) | 10~30 sec | 20~40 sec |
| Ramp-down Rate | <6°C/sec | <6°C/sec |
| Time 25°C to Peak Temperature | <6 minutes | <8 minutes |

3. Flow (wave) soldering (solder dipping)

| Products | Peak temperature | Dipping time |
|------------------|------------------|--------------|
| Pb devices. | 245°C ±5°C | 10sec ±1sec |
| Pb-Free devices. | 260°C ±5°C | 10sec ±1sec |