



# 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 .....	$\pm 20$ V
Continuous Drain Current ( $T_A=25^\circ C$ ) <sup>(1)</sup> .....	200 mA
Continuous Drain Current ( $T_A=100^\circ C$ ) <sup>(1)</sup> .....	115 mA
Pulsed Drain Current ( $T_A=25^\circ C$ ) <sup>(2)</sup> .....	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

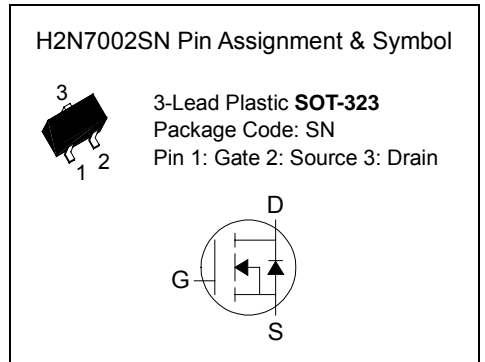
Thermal Resistance, Junction-to-Ambient..... 625 °C / W

## 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	$\mu A$
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	$\Omega$
		$V_{GS}=5V, I_D=50mA$	-	2.8	5	$\Omega$
		$V_{GS}=10V, I_D=500mA$	-	2.3	5	$\Omega$
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

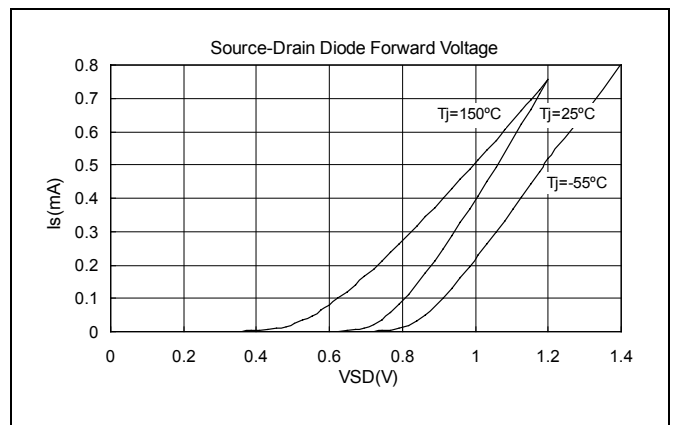
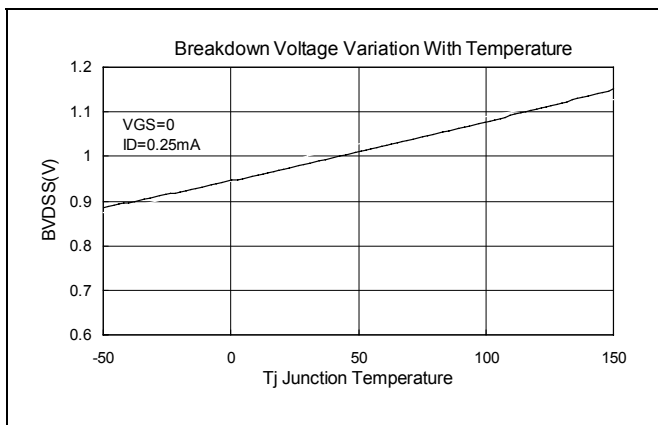
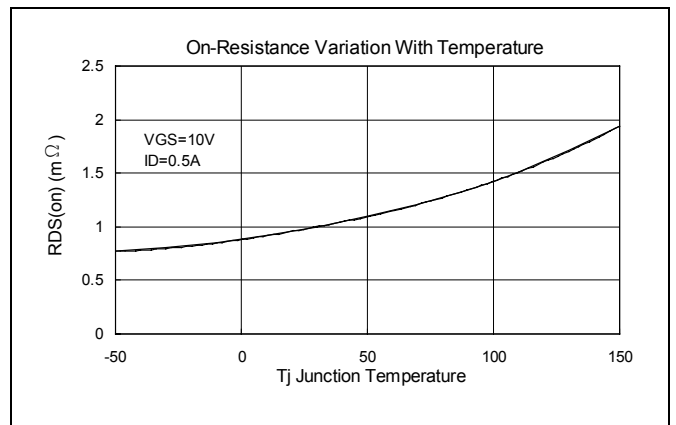
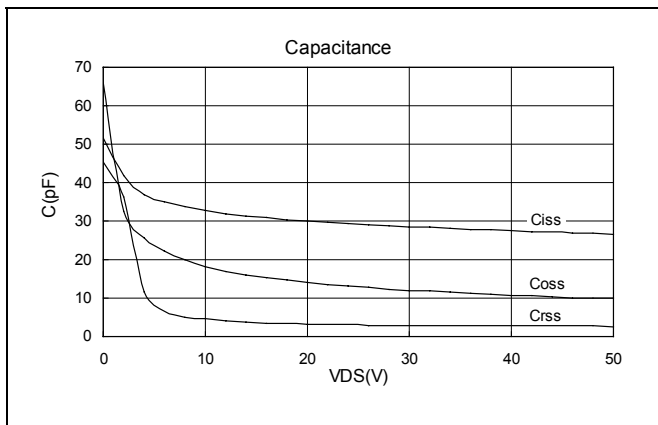
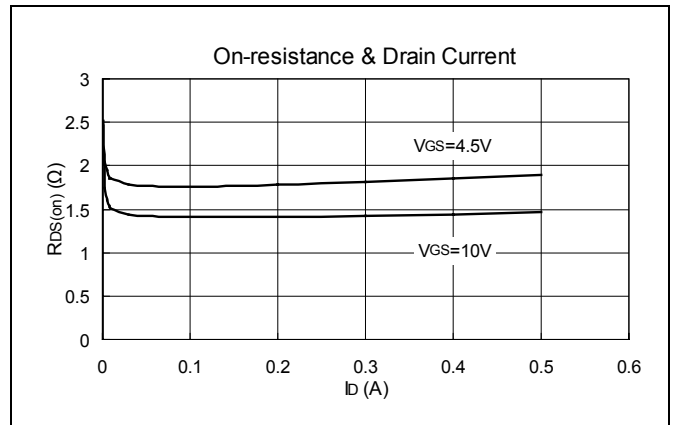
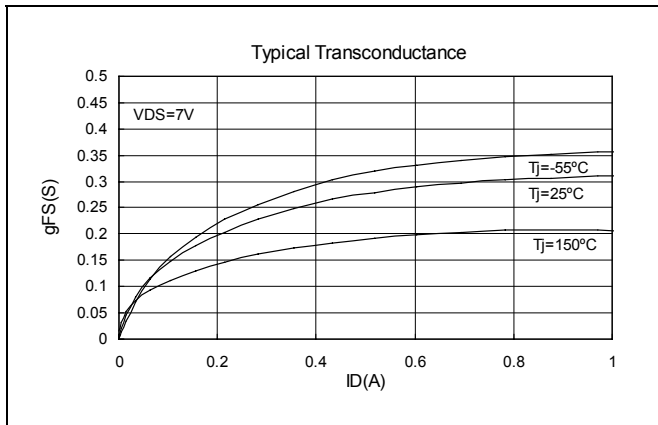
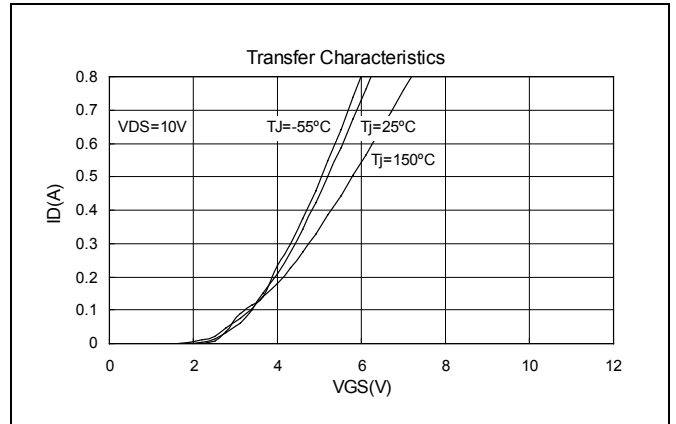
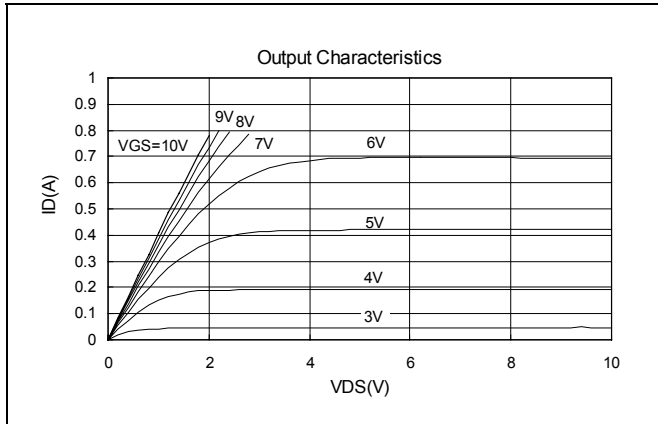
(1)The Power Dissipation of the package may result in a continuous drain current.

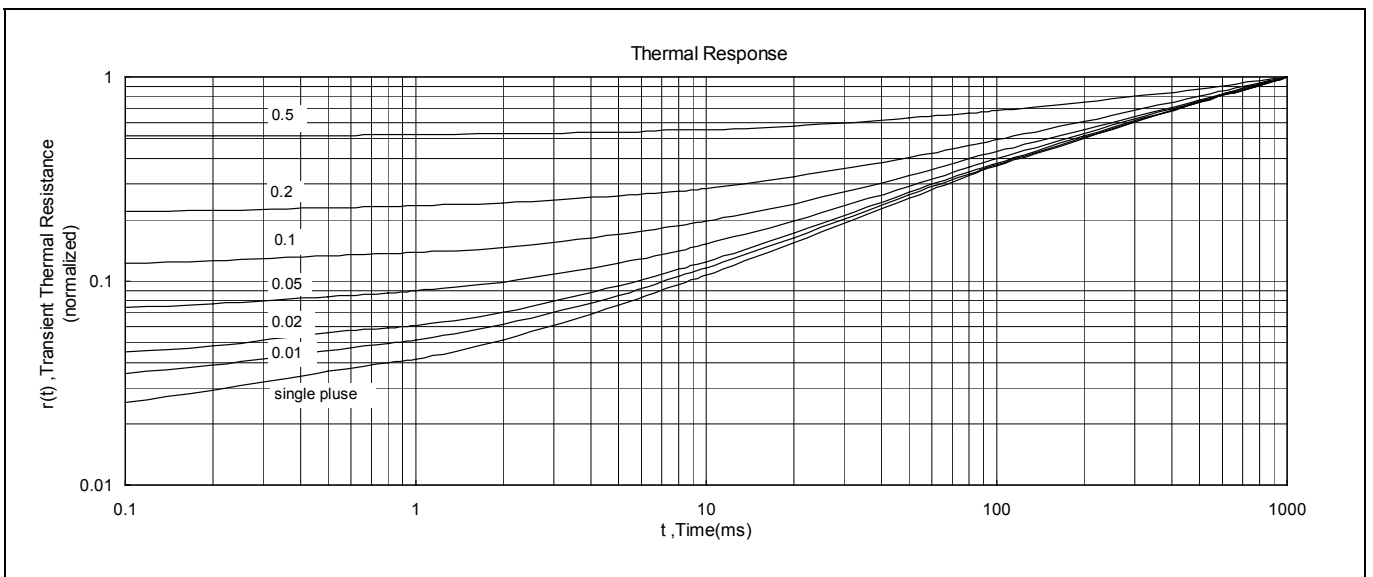
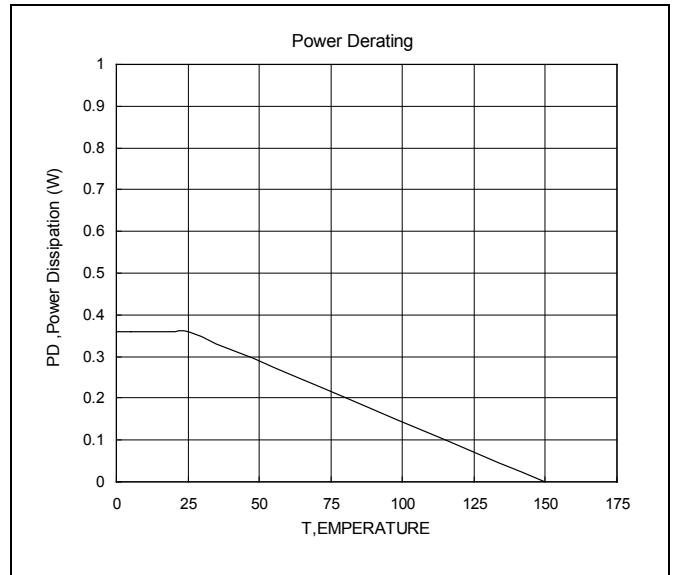
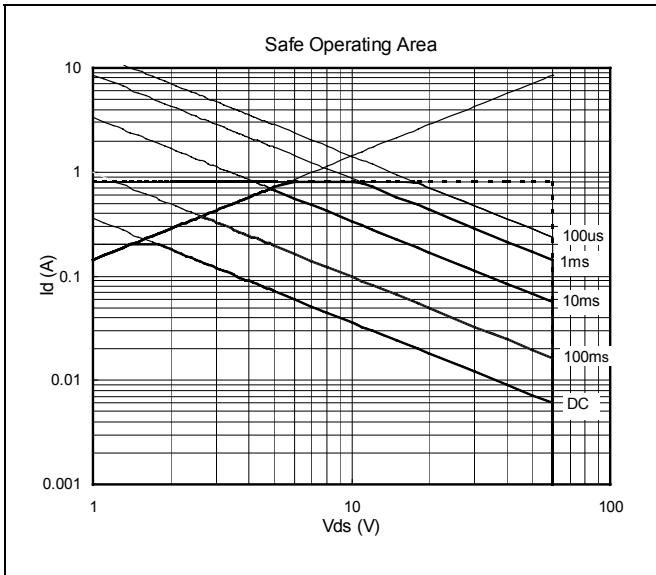
(2)Pulse Width $\leq 300\mu s$ , Duty cycle $\geq 2\%$ .





### Characteristics Curve







### SOT-323(SC-70) Dimension

**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

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

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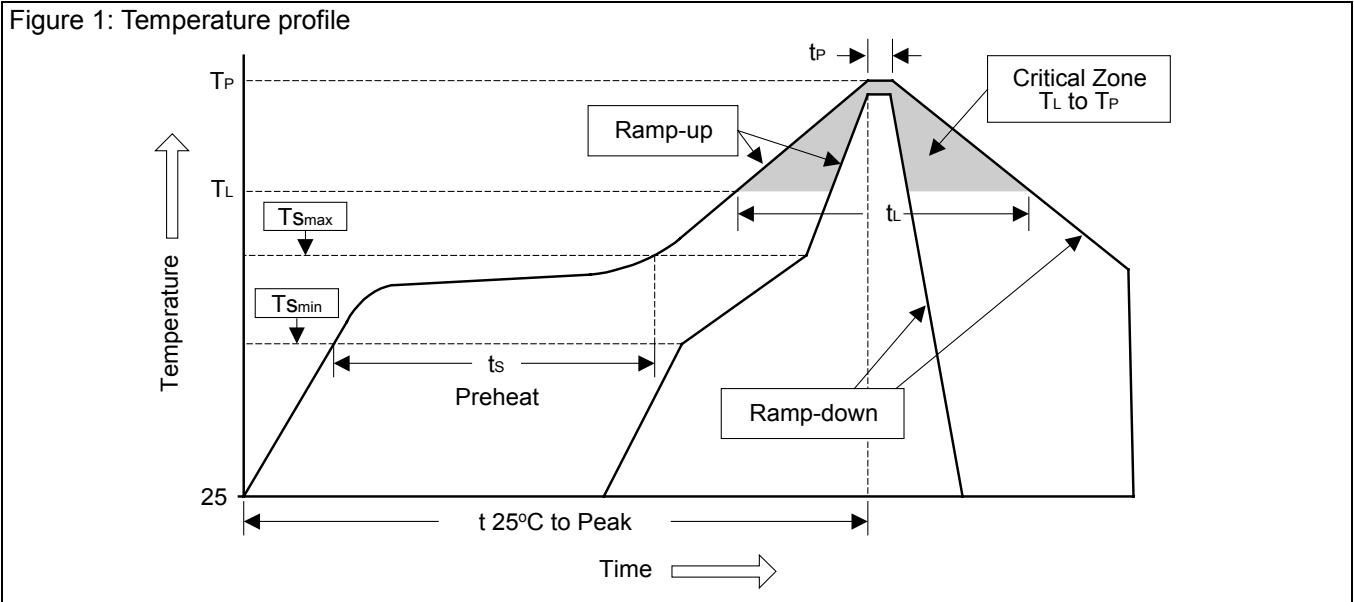
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### Soldering Methods for HSMC's Products

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 <sub>L</sub> to T <sub>P</sub> )	<3°C/sec	<3°C/sec
Preheat		
- Temperature Min (T <sub>smin</sub> )	100°C	150°C
- Temperature Max (T <sub>smax</sub> )	150°C	200°C
- Time (min to max) (ts)	60~120 sec	60~180 sec
T <sub>smax</sub> to T <sub>L</sub>		
- Ramp-up Rate	<3°C/sec	<3°C/sec
Time maintained above:		
- Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60~150 sec	60~150 sec
Peak Temperature (T <sub>P</sub> )	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	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