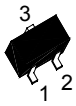
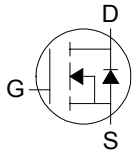
H2N7002SN

N-Channel MOSFET (60V, 0.2A)

H2N7002SN Pin Assignment & Symbol



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



Description

N-channel enhancement-mode MOS transistor.

Absolute Maximum Ratings

Drain-Source Voltage ..... 60 V
Drain-Gate Voltage (R_{GS}=1MΩ) ..... 60 V
Gate-Source Voltage ..... ±20 V
Continuous Drain Current (T_A=25°C)(1) ..... 200 mA
Continuous Drain Current (T_A=100°C)(1) ..... 115 mA
Pulsed Drain Current (T_A=25°C)(2) ..... 800 mA
Total Power Dissipation (T_C=25°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

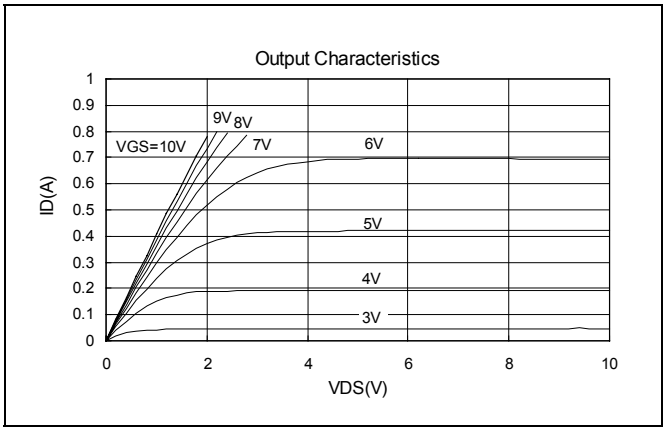
Thermal Resistance, Junction-to-Ambient ..... 625 °C / W

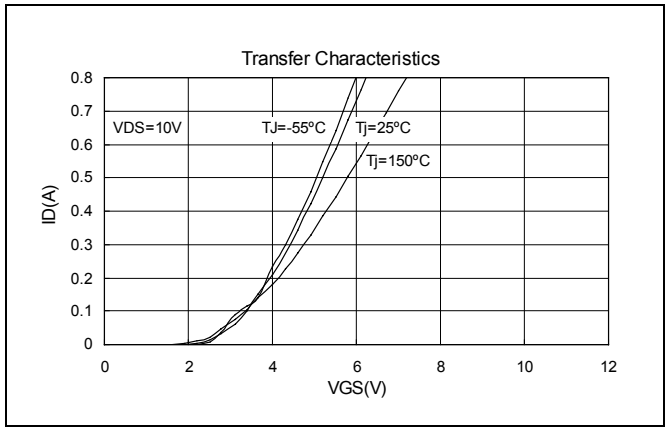
Electrical Characteristics (T_A=25°C)

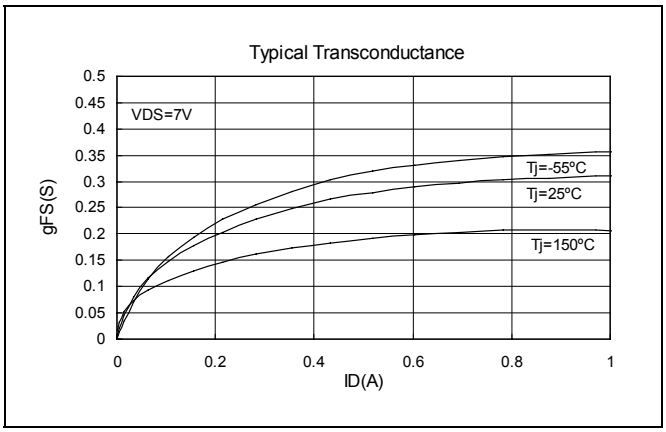
Parameter	Symbol	Test Conditions	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0, I_D=10uA	60	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=2.5V, I_D=0.25mA	1	-	2.5	V
Gate Source Leakage Current, Forward	$I_{GSS/F}$	V_{GS}=+20V, V_{DS}=0	-	-	100	nA
Gate Source leakage Current, Reverse	$I_{GSS/R}$	V_{GS}=-20V, V_{DS}=0	-	-	-100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0	-	-	1	uA
On-State Drain Current	$I_{D(ON)}$	V_{DS}>2$V_{DS(ON)}$, 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}>2$V_{DS(ON)}$, I_D=200mA	80	-	-	mS
Turn-on Delay Time	$t_{d(on)}$	(V_{DD}=50V, R_D=250Ω, V_{GS}=10V, R_G=50Ω)	-	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

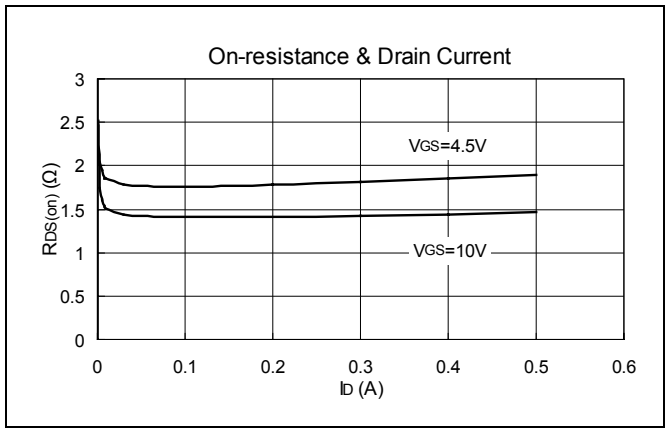
(1)The Power Dissipation of the package may result in a continuous drain current.
(2)Pulse Width≤300us, Duty cycle≥2%.

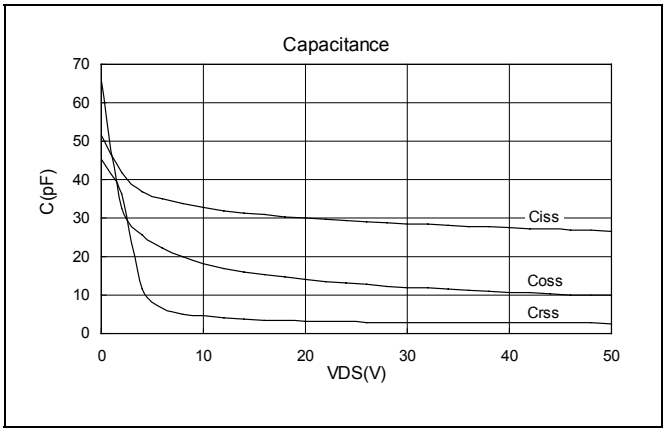
Characteristics Curve

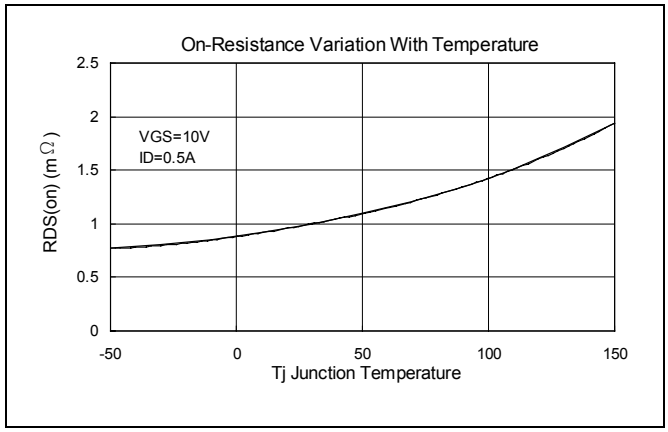


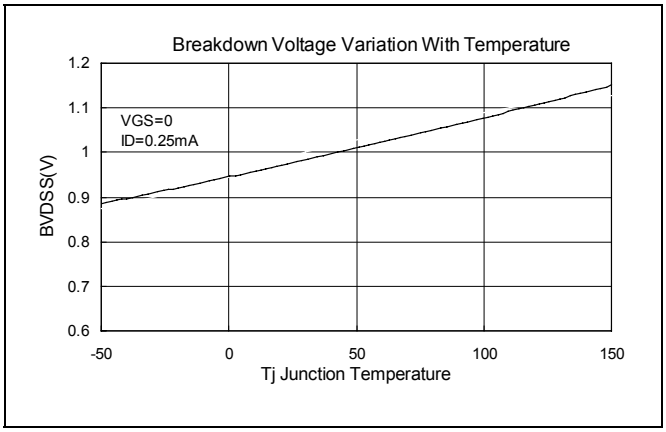


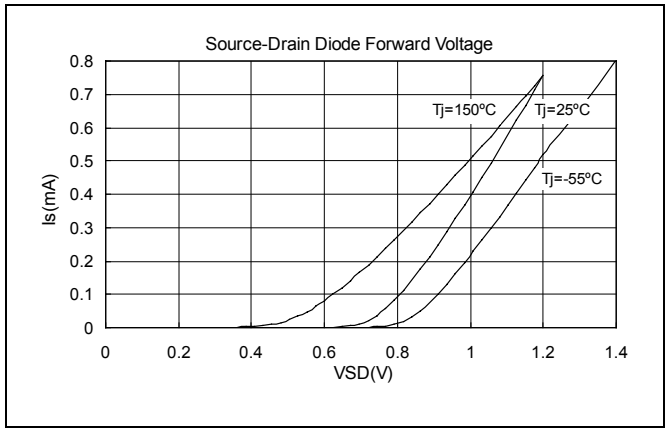


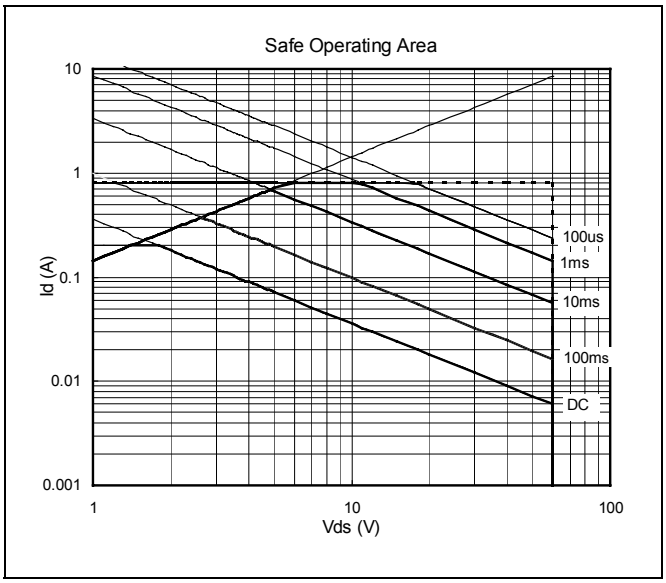


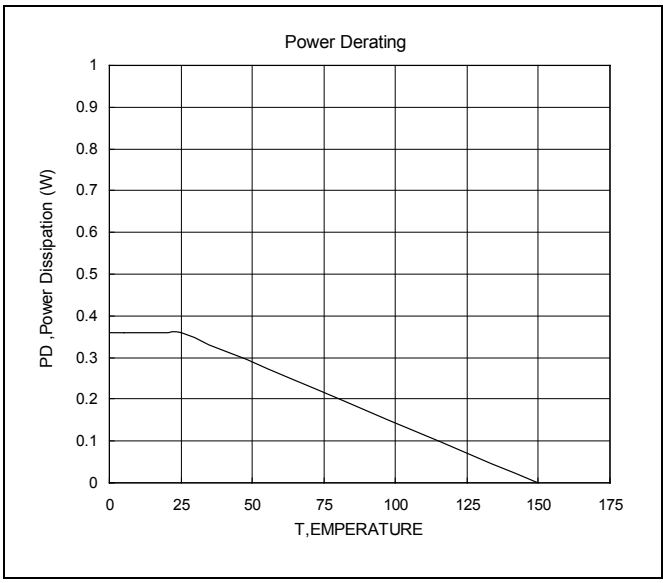


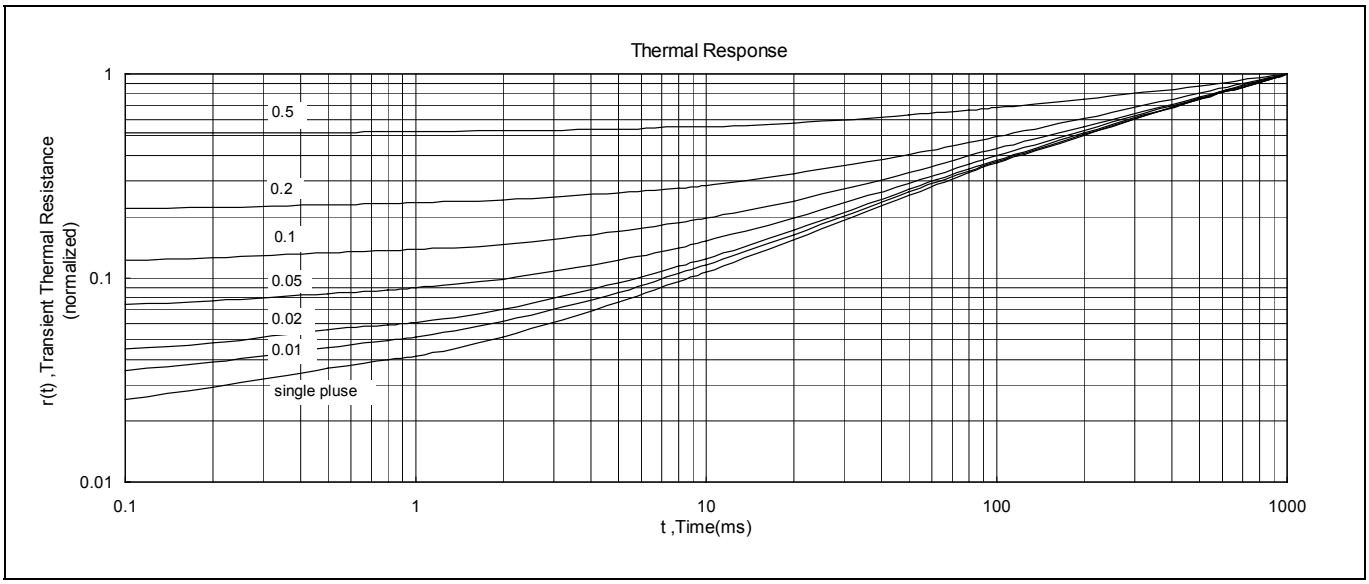




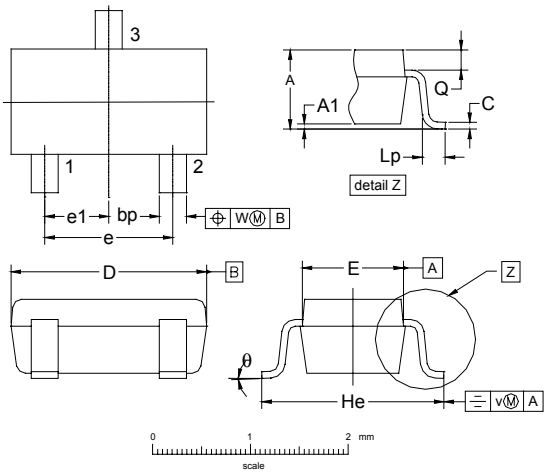



Safe Operating Area
Id (A)
Vds (V)
10
1
0.1
0.01
0.001
1
10
100
100us
1ms
10ms
100ms
DC


Power Derating
PD ,Power Dissipation (W)
T,EMPERATURE
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
25
50
75
100
125
150
175

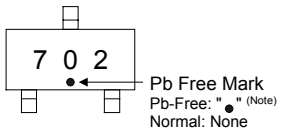

Thermal Response
r(t) ,Transient Thermal Resistance
(normalized)
t ,Time(ms)
1
0.1
0.01
0.1
1
10
100
1000
0.5
0.2
0.1
0.05
0.02
0.01
single pluse

SOT-323(SC-70) Dimension



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

Marking:



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

Head Office And Factory:

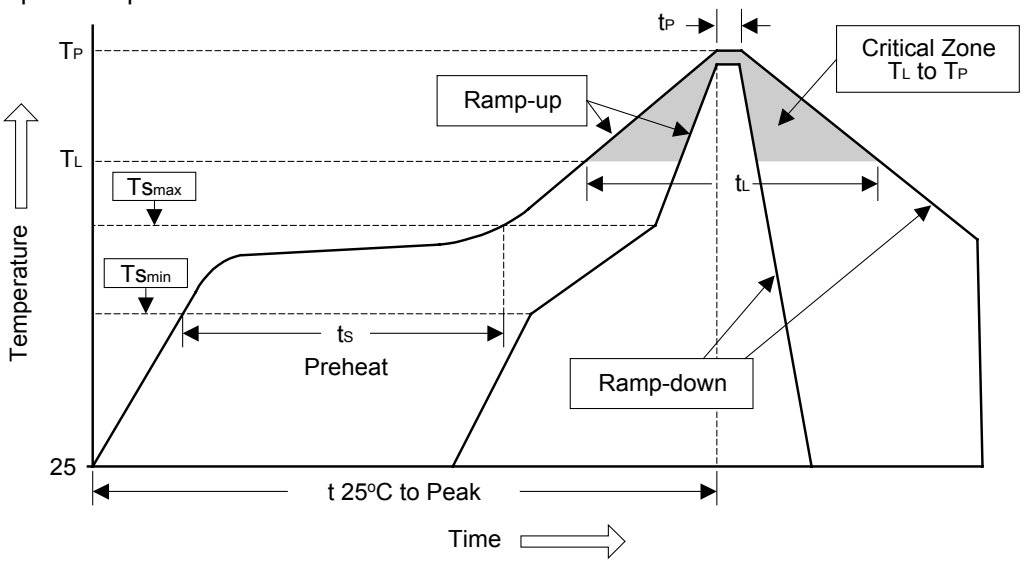
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
  Tel: 886-2-2521-2056 Fax: 886-2-2563-2712
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-598-3621~5 Fax: 886-3-598-2931

Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%

2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



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 (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60~120 sec	 150°C 200°C 60~180 sec
Tsmax to T_L - Ramp-up Rate	 <3°C/sec	 <3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60~150 sec	 217°C 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