

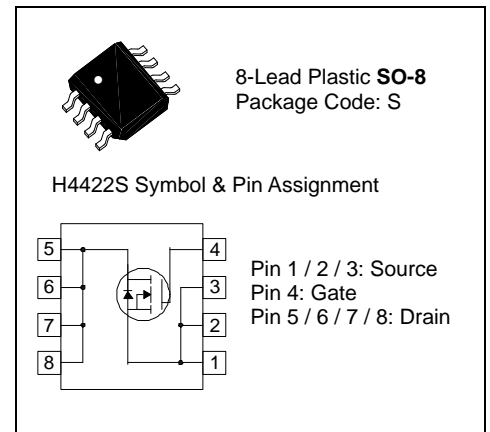


# H4422S

N-Channel Enhancement-Mode MOSFET (30V, 11A)

## Features

- $R_{DS(on)}=13.5m\Omega@V_{GS}=10V, I_D=11A$
- $R_{DS(on)}=24m\Omega@V_{GS}=4.5V, I_D=5A$
- Advanced trench process technology
- High Density Cell Design for Ultra Low On-Resistance



## Absolute Maximum Ratings (T<sub>A</sub>=25°C, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V <sub>DS</sub>	Drain-Source Voltage	30	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current (Continuous)	11	A
I <sub>DM</sub>	Drain Current (Pulsed) <sup>*1</sup>	50	A
P <sub>D</sub>	Total Power Dissipation @T <sub>A</sub> =25°C	2.5	W
T <sub>j</sub> , T <sub>stg</sub>	Operating and Storage Temperature Range	-55 to +150	°C
R <sub>θJA</sub>	Thermal Resistance Junction to Ambient (PCB mounted) <sup>*2</sup>	50	°C/W

\*1: Maximum DC current limited by the package

\*2: 1-in<sup>2</sup> 2oz Cu PCB board



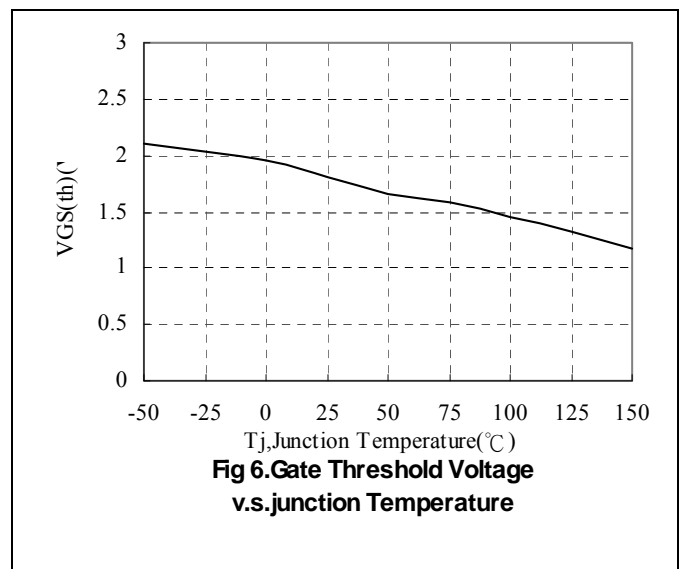
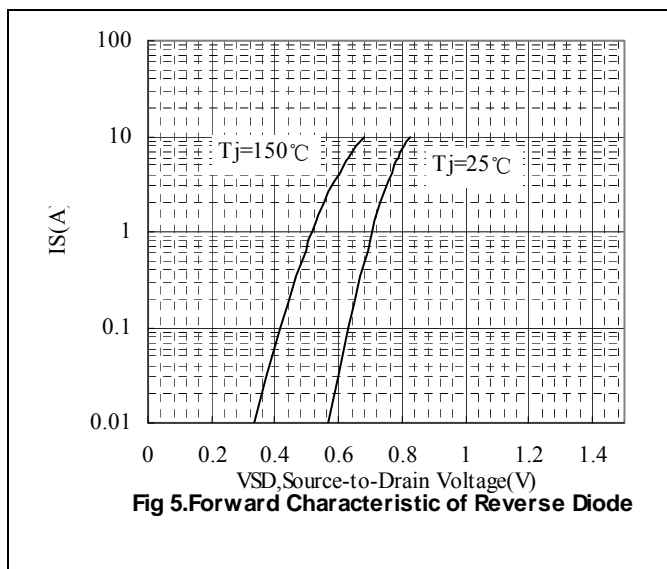
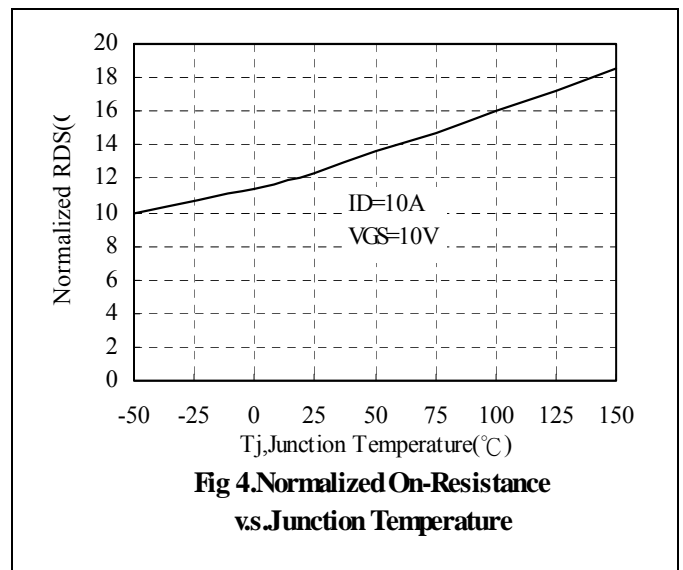
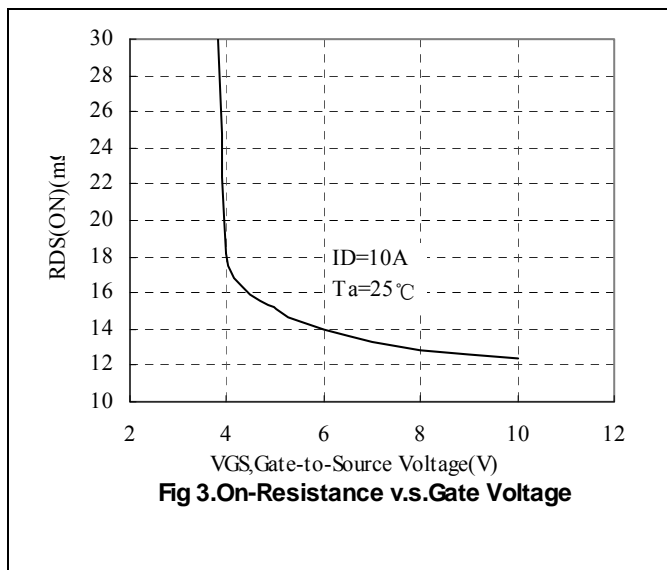
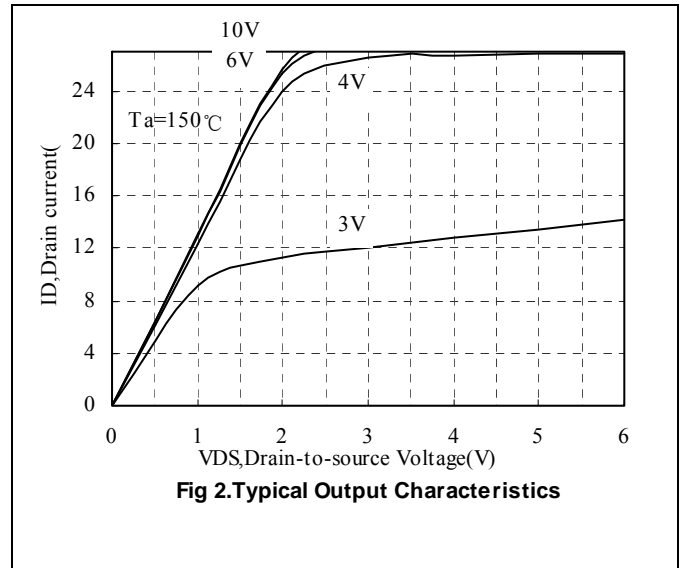
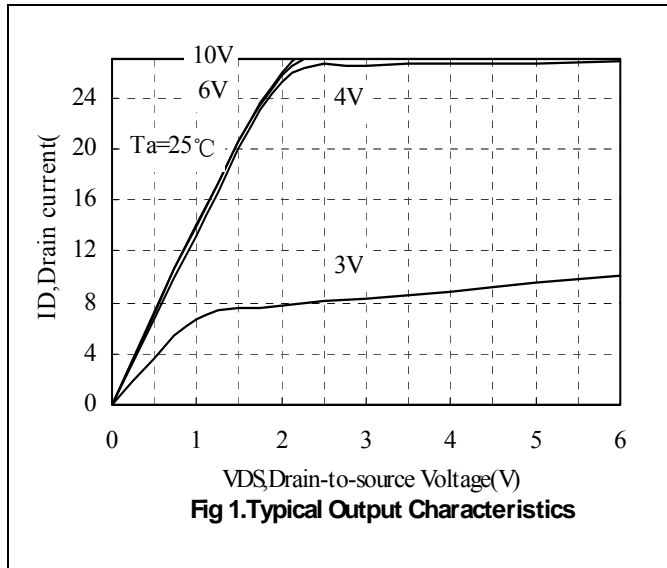
### Electrical Characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
<b>• Static</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=11A$			13.50	m $\Omega$
		$V_{GS}=4.5V, I_D=5.0A$			24	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	3	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	-	-	1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
$g_{FS}$	Forward Transconductance	$V_{DS}=10V, I_D=10A$		20	-	S
<b>• Drain-Source Diode Characteristics</b>						
$I_S$	Maximum Diode Forward Current		-	-	2.6	A
$V_{SD}$	Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=2.1A$	-	-	1.2	V

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



### Characteristics Curve





### SO-8 Dimension

8-Lead SO-8 Plastic  
Surface Mounted Package  
HSMC Package Code: S

**H9435S Marking:**

Pb Free Mark  
 Pb-Free: "●" (Note)  
 Normal: None

Pin Style: 1,2,3: Source 4: Gate 5,6,7,8: Drain

Note: Green label is used for pb-free packing

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	4.85	5.10
B	3.85	3.95
C	5.80	6.20
D	1.22	1.32
E	0.37	0.47
F	3.74	3.88
G	1.45	1.65
H	4.80	5.10
I	0.05	0.20
J	0.30	0.70
K	0.19	0.25
L	0.37	0.52
M	0.23	0.28
N	0.08	0.13
O	0.00	0.15

\*: Typical, Unit: mm

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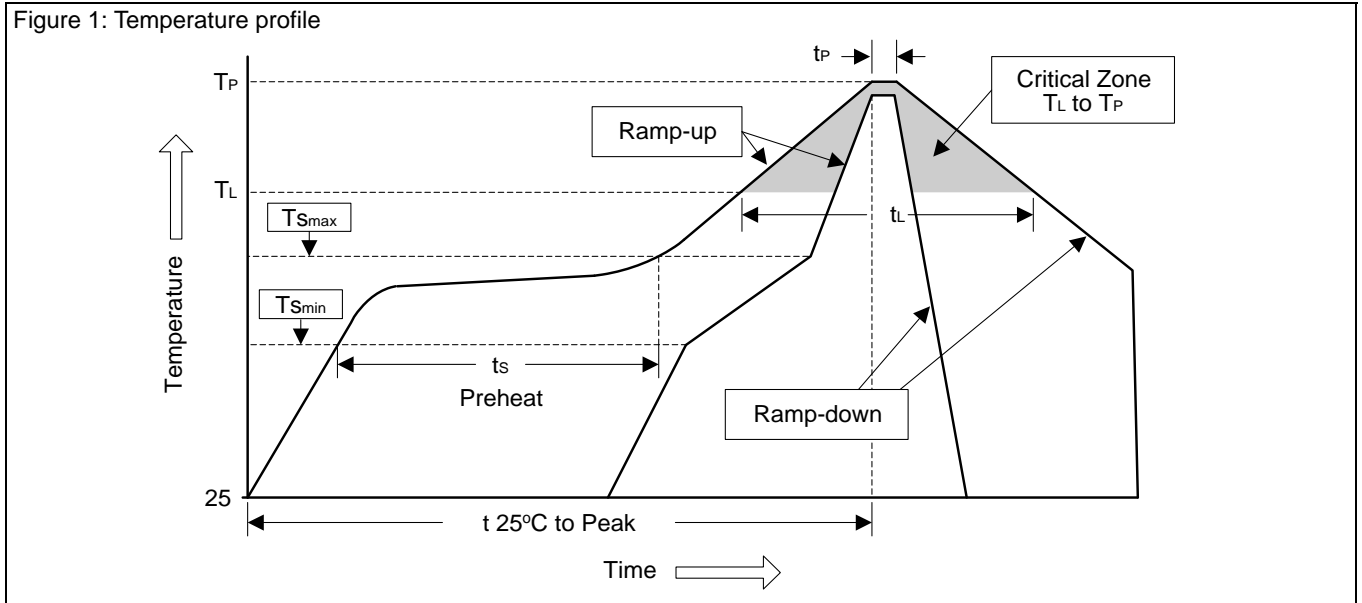
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### Soldering Methods for HSMC's Products

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

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 ( $T_{Smin}$ )	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	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec