

Datasheet

# FS8820S

Dual N-Channel Enhancement Mode Power MOSFET

FORTUNE,  
Properties  
For Reference Only

**Fortune Semiconductor Corporation**

富晶電子股份有限公司  
28F, No. 27, Sec. 2, Zhongzheng E. Rd.,  
Danshui Dist, New Taipei City 251, Taiwan  
Tel. : 886-2-28094742  
Fax : 886-2-28094874  
www.ic-fortune.com

This manual contains new product information. **Fortune Semiconductor Corporation** reserves the rights to modify the product specification without further notice. No liability is assumed by **Fortune Semiconductor Corporation** as a result of the use of this product. No rights under any patent accompany the sale of the product

**1. Features**

1.1 Low on-resistance

1.1.1  $R_{DS(ON)} = 24\text{ m}\Omega$  MAX. ( $V_{GS} = 4.5\text{V}$ ,  $I_D = 6\text{A}$ )

1.1.2  $R_{DS(ON)} = 32\text{ m}\Omega$  MAX. ( $V_{GS} = 2.5\text{V}$ ,  $I_D = 5\text{A}$ )

1.1.3 ESD Rating:  $\geq 2000\text{V}$  HBM

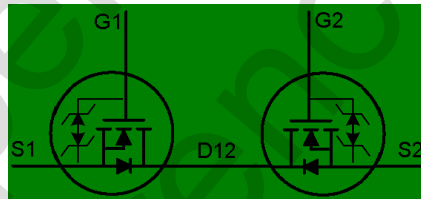
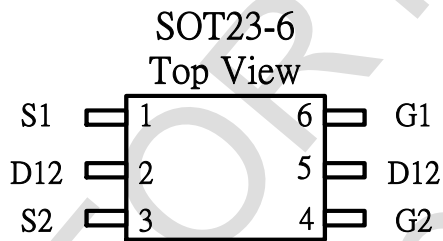
**2. Applications**

- Li-ion battery management applications

**3. Ordering Information**

Product Number	Description	Package Type	Quantity/Reel
FS8820S	SOT-23-6 version	SOT-23-6	3,000

**4. Pin Assignment**



**5. Limiting Values**

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	20	V
VGS	Gate-Source Voltage	$\pm 12$	V
ID @TA = 25°C	Continuous Drain Current <sup>3</sup>	6.5	A
ID @TA = 100°C	Continuous Drain Current <sup>3</sup>	4	A
IDM	Pulsed Drain Current <sup>1</sup>	20	A
PD @TA = 25°C	Total Power Dissipation	1.25	W
TSTG	Storage Temperature Range	-55 to 150	°C
TJ	Operating Junction Temperature Range	-55 to 150	°C
Is	Diode Forward Current	1.7	A

**6. Thermal Data**

Symbol	Parameter	Value	Unit
Rthj-a	Thermal Resistance Junction-ambient <sup>3</sup>	Max. 125	°C/W

**7. Electrical Characteristics**

Electrical Characteristics @ $T_A = 25^{\circ}C$  ( unless otherwise specified )

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	20	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to $25^{\circ}C, I_D = 1mA$	-	0.1	-	$V/^{\circ}C$
$R_{DS(ON)}^1$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS} = 4.5V, I_D = 6A$	-	19	24	$m\Omega$
		$V_{GS} = 2.5V, I_D = 5A$	-	25	32	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	0.7	1.0	V
$I_{DSS}$	Drain-Source Leakage Current ( $T_j = 25^{\circ}C$ )	$V_{DS} = 16V, V_{GS} = 0V$	-	-	1	$\mu A$
	Drain-Source Leakage Current ( $T_j = 85^{\circ}C$ )	$V_{DS} = 16V, V_{GS} = 0V$	-	-	30	$\mu A$
$I_{GSS}$	Gate-Source Leakage	$V_{GS} = \pm 10V$	-	-	$\pm 10$	$\mu A$
<b>Diode Characteristics</b>						
$V_{SD}^1$	Diode Forward Voltage	$I_{SD} = 1.7A, V_{GS} = 0V$		0.7	1.0	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = 6A, dI_{SD}/dt = 100A/\mu s$		27		Ns
$Q_{rr}$	Reverse Recovery Charge			15		nC
<b>Dynamic Characteristics<sup>2</sup></b>						
$R_G$	Gate Resistance	$V_{GS} = V_{DS} = 0V, F = 1MHz$		4		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS} = 0V, V_{DS} = 10V$ Frequency = 1MHz		1110		pF
$C_{oss}$	Output Capacitance			240		
$C_{rss}$	Reverse Transfer Capacitance			200		
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 10V, V_{GEN} = 4.5V,$ $R_G = 6\Omega, R_L = 10\Omega,$ $I_{DS} = 1A$		6	12	ns
$t_r$	Turn-on Rise Time			13	24	
$t_d(off)$	Turn-off Delay Time			67	122	
$t_f$	Turn-off Rise Time			37	68	
<b>Gate Charge Characteristics<sup>2</sup></b>						
$Q_g$	Total Gate Charge	$V_{GS} = 4.5V, V_{DS} = 10V,$ $I_{DS} = 6A$		15	21	nC
$Q_{gs}$	Gate-Source Charge			1.5		
$Q_{gd}$	Gate-Drain Charge			4.7		

**Notes :**

1. Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
2. Guaranteed by design, not subject to production testing

### 8. Typical Characteristics

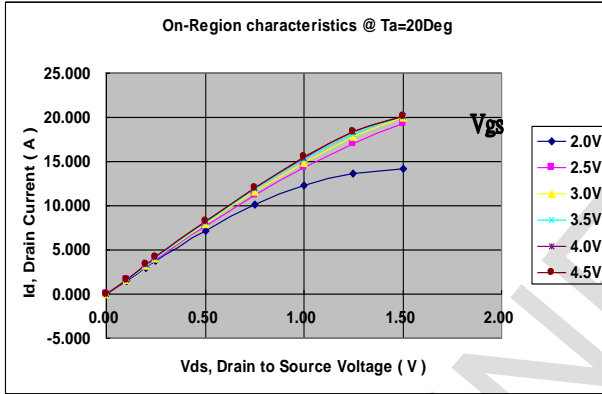


Fig 1. Typical Output Characteristics

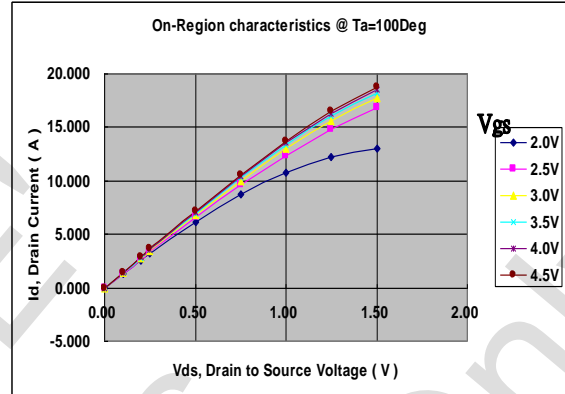


Fig 2. Typical Output Characteristics

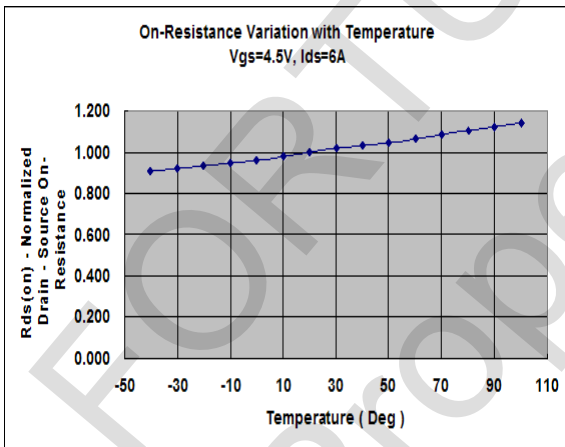


Fig 3. Normalized On-Resistance

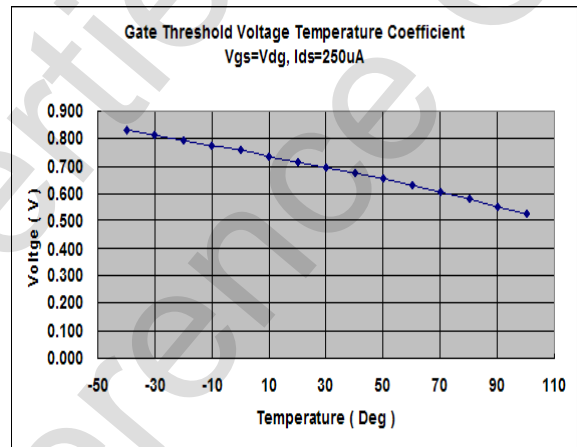


Fig 4. Gate Threshold Variation with Temperature

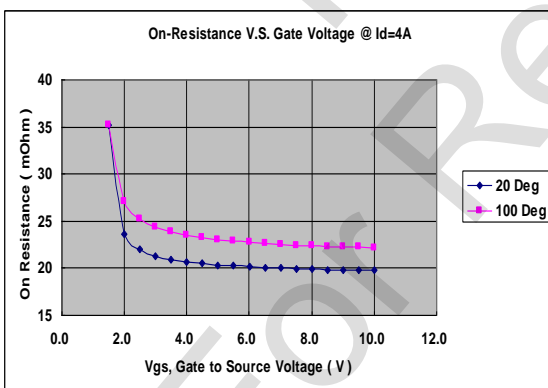
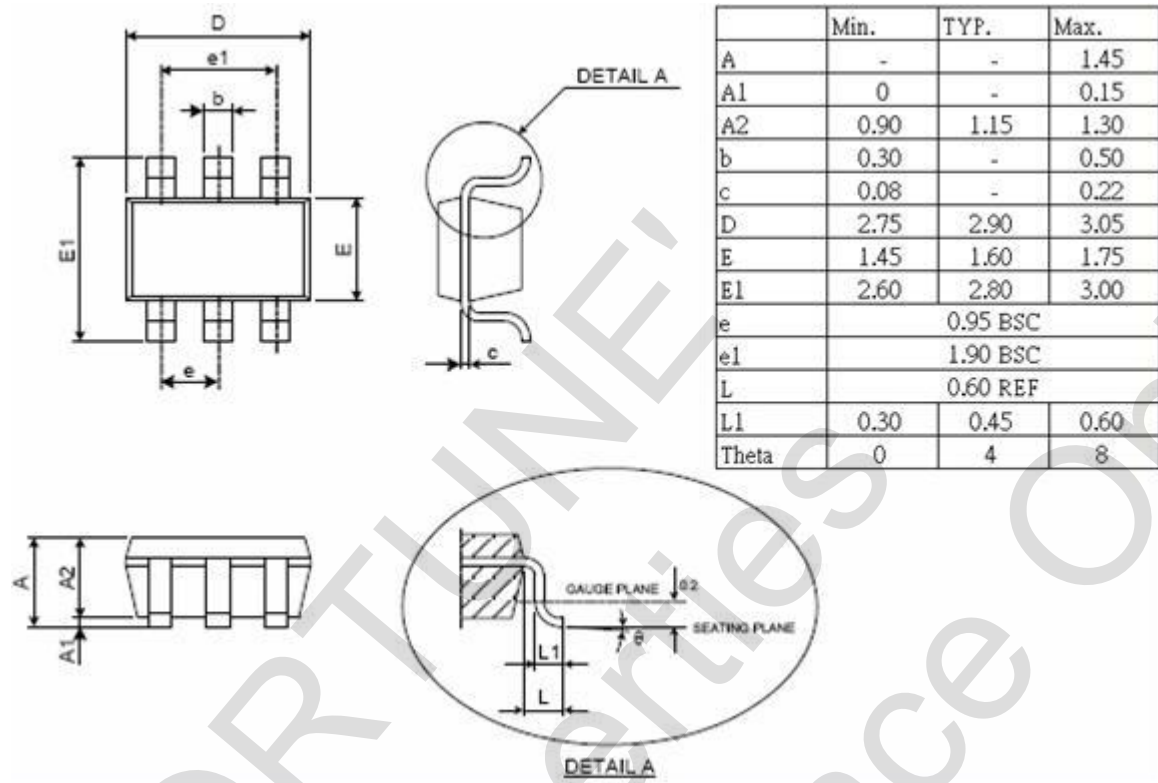


Fig 5. Forward Characteristic of Reverse Diode

9. Package Information



10. Revision History

Version	Date	Page	Description
1.0	2011/12/26	-	Version 1.0 released