

Datasheet

# FS8820

Dual N-Channel Enhancement Mode Power MOSFET

FORTUNE,  
Properties  
For Reference Only

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**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

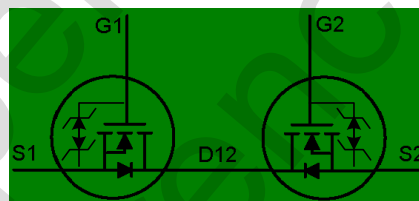
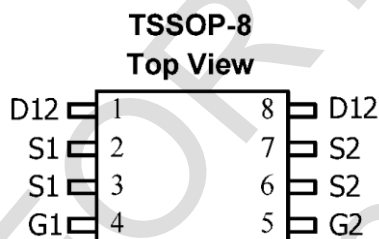
**2. Applications**

- Li-ion battery management applications

**3. Ordering Information**

Product Number	Description	Package Type	Quantity/Reel
FS8820	TSSOP8 package version	TSSOP-8	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<sub>j</sub> = 25°C ( unless otherwise specified )

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	20	-	-	V
Δ BV <sub>DSS</sub> /Δ T <sub>j</sub>	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	-	0.1	-	V/°C
R <sub>DS(ON)</sub> <sup>1</sup>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A	-	19	24	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 5A	-	25	32	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA	0.5	0.7	1.0	V
I <sub>DSS</sub>	Drain-Source Leakage Current (T <sub>j</sub> = 25°C)	V <sub>DS</sub> =16 V <sub>GS</sub> = 0V	-	-	1	uA
	Drain-Source Leakage Current (T <sub>j</sub> = 85°C)	V <sub>DS</sub> =16 V <sub>GS</sub> = 0V	-	-	30	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> = ±10V	-	-	±10	uA
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>1</sup>	Diode Forward Voltage	I <sub>SD</sub> =1.7A, V <sub>GS</sub> =0V		0.7	1.0	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =6A, dI <sub>SD</sub> /dt=100A/μ		27		Ns
Q <sub>rr</sub>	Reverse Recovery Charge	s		15		nC
<b>Dynamic Characteristics<sup>2</sup></b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =V <sub>DS</sub> =0V, F=1MHz		4		Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V Frequency=1MHz		1110		pF
C <sub>oss</sub>	Output Capacitance			240		
C <sub>rss</sub>	Reverse Transfer Capacitance			200		
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =10V, V <sub>GEN</sub> =4.5V, R <sub>G</sub> =6Ω, R <sub>L</sub> =10Ω, I <sub>DS</sub> =1A		6	12	ns
t <sub>r</sub>	Turn-on Rise Time			13	24	
t <sub>d(off)</sub>	Turn-off Delay Time			67	122	
t <sub>f</sub>	Turn-off Rise Time			37	68	
<b>Gate Charge Characteristics<sup>2</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>DS</sub> =6A		15	21	nC
Q <sub>gs</sub>	Gate-Source Charge			1.5		
Q <sub>gd</sub>	Gate-Drain Charge			4.7		

**Notes :**

1. Pulse width ≤ 300us, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing

### 8. Typical Characteristics

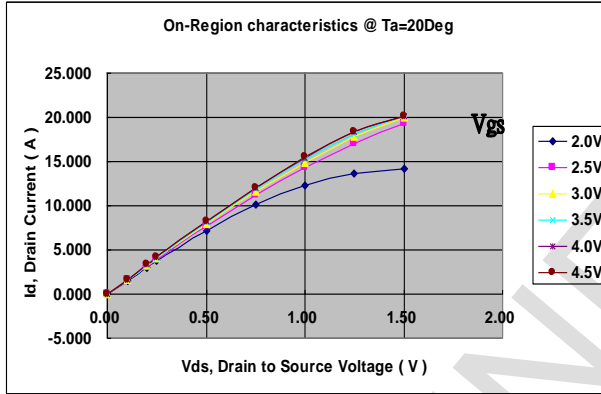


Fig 1. Typical Output Characteristics

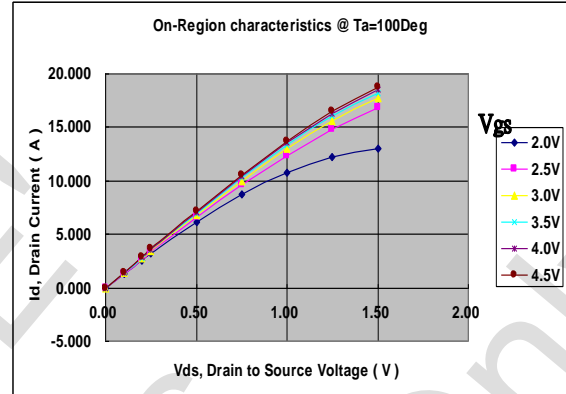


Fig 2. Typical Output Characteristics

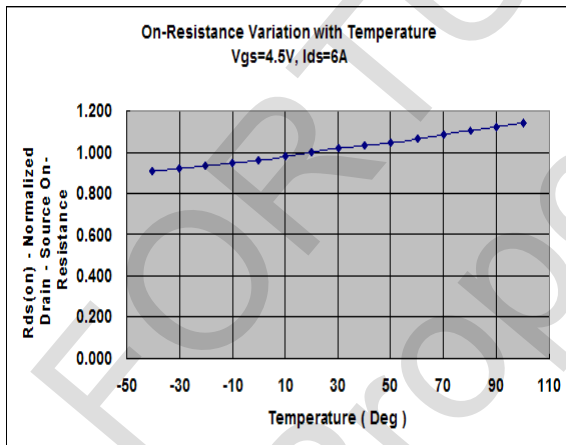


Fig 3. Normalized On-Resistance

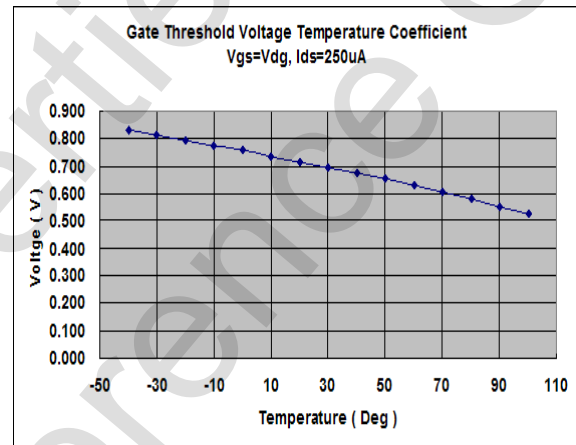


Fig 4. Gate Threshold Variation with Temperature

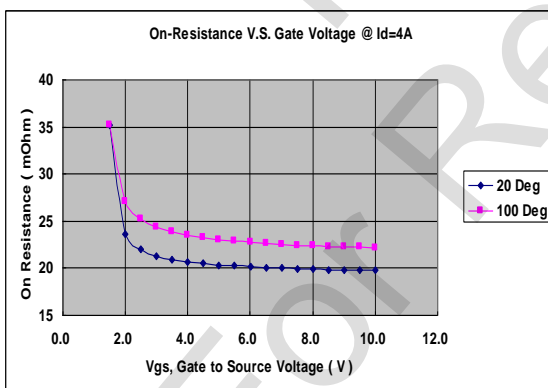
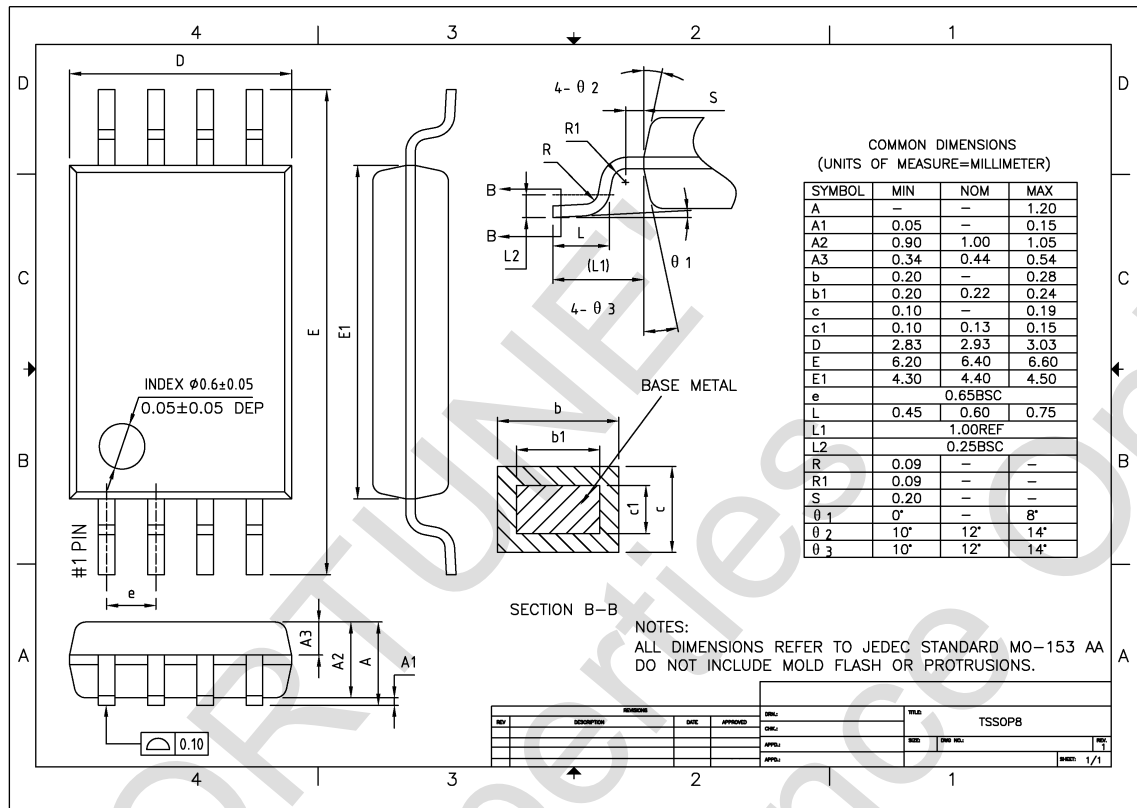


Fig 5. Forward Characteristic of Reverse Diode

9. Package Information



10. Revision History

Version	Date	Page	Description
1.0	2010/01/04	-	Version 1.0 released
1.1	2011/07/01	4	RDS45, VGS=4.5V, IDS=6A, Typ.=19mR, Max.=24mR RDS25, VGS=2.5V, IDS=5A, Typ.=25mR, Max.=32mR
1.2	2014/05/22	2	Revised company address