

## N-Channel 30 V (D-S) MOSFET



**RoHS**  
COMPLIANT

PRODUCT SUMMARY			
V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (Ω)(Max.)	I <sub>D</sub> (A) <sup>a</sup>	Q <sub>g</sub> (Typ.)
30	1.5 at V <sub>GS</sub> = 4.5 V	0.5	1.15 nC
	2 at V <sub>GS</sub> = 2.5 V		

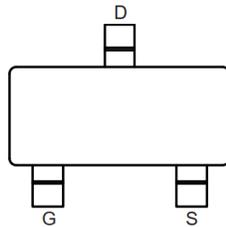
### FEATURES

- DT-Trench Power MOSFET
- Low R<sub>DS(on)</sub> Provides Higher Efficiency and Extends Battery Life
- EU RoHS Compliant

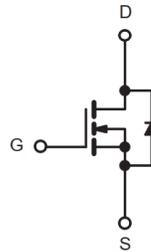
### APPLICATIONS

- Load/Power switch
- Battery management for ultra portable electronics

SOT-23 Pin Configuration



Top View



N-Channel MOSFET

### ■ Absolute Maximum Ratings Ta = 25°C

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	
Continuous Drain Current <sup>1</sup> Steady State	I <sub>D</sub>	T <sub>A</sub> =25°C	A
		T <sub>A</sub> =85°C	
Continuous Drain Current <sup>1</sup> t < 10 s		T <sub>A</sub> =25°C	
		T <sub>A</sub> =85°C	
Pulsed Drain Current tp = 10 us	I <sub>DM</sub>	1.7	
Power Dissipation <sup>1</sup> Steady State	P <sub>D</sub>	0.69	W
Power Dissipation <sup>1</sup> t < 5 s		0.83	
Thermal Resistance.Junction- to-Ambient- Steady State <sup>1</sup>	R <sub>thJA</sub>	180	°C/W
Thermal Resistance.Junction- to-Ambient- t < 10 s <sup>1</sup>		150	
Thermal Resistance.Junction- to-Ambient- Steady State <sup>2</sup>		300	
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)	T <sub>L</sub>	260	°C
Junction Temperature	T <sub>J</sub>	150	
Storage Temperature Range	T <sub>stg</sub>	-55 to 150	

Notes:1. Surface-mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces).

2. Surface-mounted on FR4 board using the minimum recommended pad size.

**Electrical Characteristics Ta = 25°C**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =100 μA, V <sub>GS</sub> =0V	30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±10V			±1	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA	0.8		1.4	V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V <sub>DSS</sub> /T <sub>J</sub>			40		mV/°C
Negative Threshold Temperature Coefficient	V <sub>GS(th)</sub> /T <sub>J</sub>			3.4		
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4V, I <sub>D</sub> =10mA			1.5	Ω
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =10mA			2	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =3V, I <sub>D</sub> =10mA		0.33		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =5V, f=1MHz		21		pF
Output Capacitance	C <sub>oss</sub>			19.7		
Reverse Transfer Capacitance	C <sub>rss</sub>			8.1		
Total Gate Charge	Q <sub>g(TOT)</sub>	V <sub>GS</sub> =5V, V <sub>DS</sub> =24V, I <sub>D</sub> =0.1A		1.15		nC
Threshold Gate Charge	Q <sub>g(TH)</sub>			0.15		
Gate Source Charge	Q <sub>gs</sub>			0.32		
Gate Drain Charge	Q <sub>gd</sub>			0.23		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =5V, I <sub>D</sub> =0.1A, R <sub>GEN</sub> =50 Ω		16.7		ns
Turn-On Rise Time	t <sub>r</sub>			47.9		
Turn-Off Delay Time	t <sub>d(off)</sub>			65.1		
Turn-Off Fall Time	t <sub>f</sub>			64.2		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>S</sub> =10mA, dI <sub>S</sub> /dt=8A/μs		14		
Maximum Body-Diode Continuous Current	I <sub>S</sub>				1	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =10mA, V <sub>GS</sub> =0V	T <sub>J</sub> =25°C		0.7	V
			T <sub>J</sub> =125°C		0.45	

■ Typical Characteristics

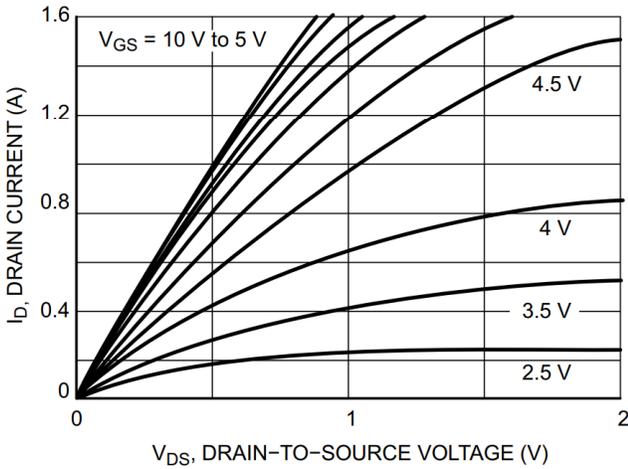


Figure 1. On-Region Characteristics

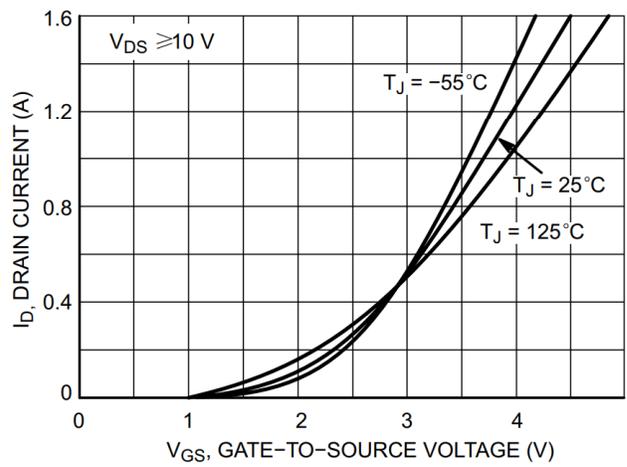


Figure 2. Transfer Characteristics

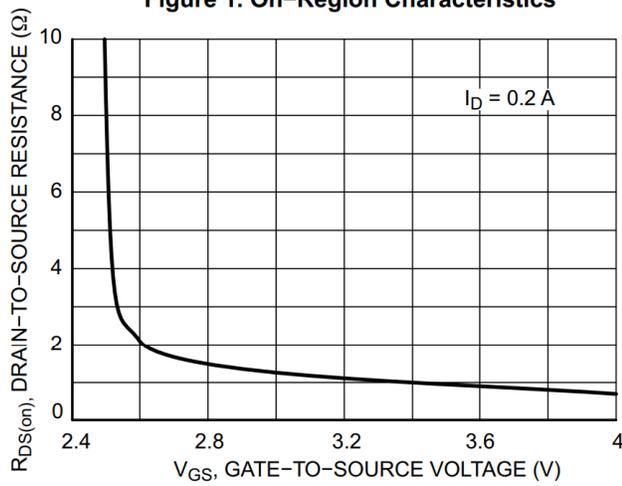


Figure 3. On-Resistance vs. Gate-to-Source Voltage

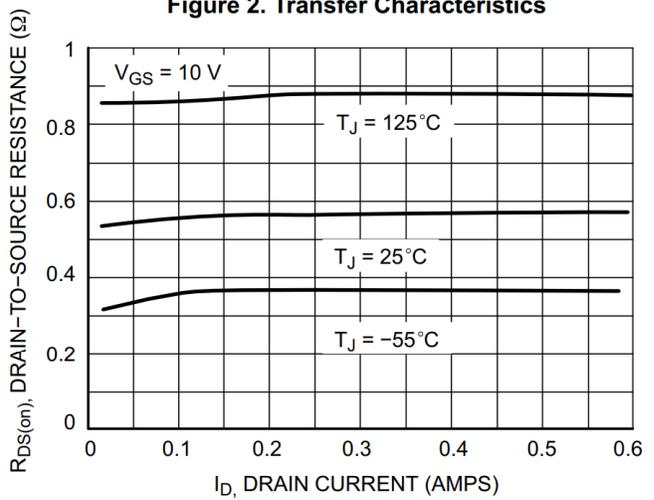


Figure 4. On-Resistance vs. Drain Current and Temperature

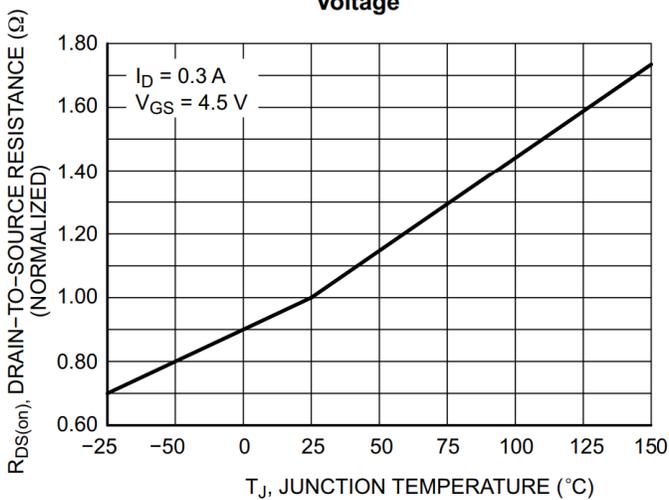


Figure 5. On-Resistance Variation with Temperature

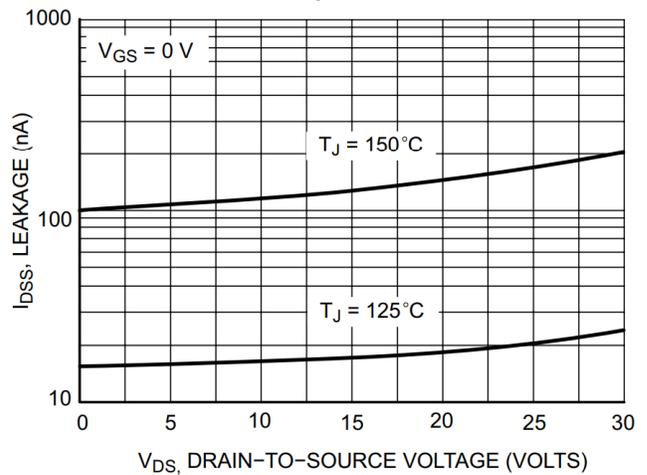


Figure 6. Drain-to-Source Leakage Current vs. Voltage

■ Typical Characteristics

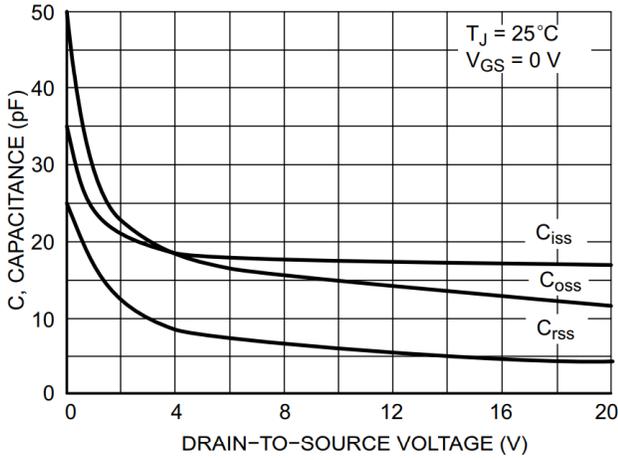


Figure 7. Capacitance Variation

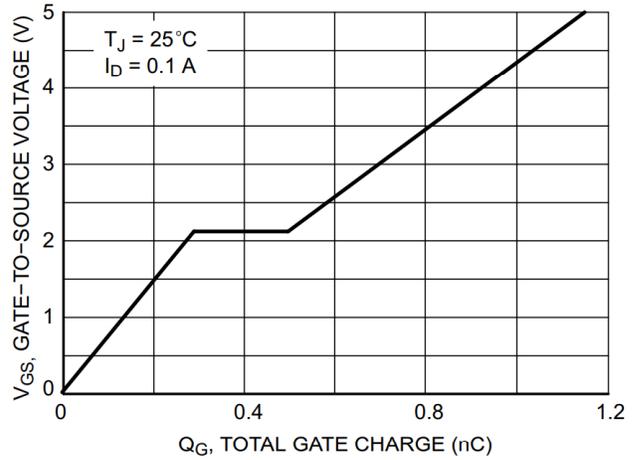


Figure 8. Gate-to-Source & Drain-to-Source Voltage vs. Total Charge

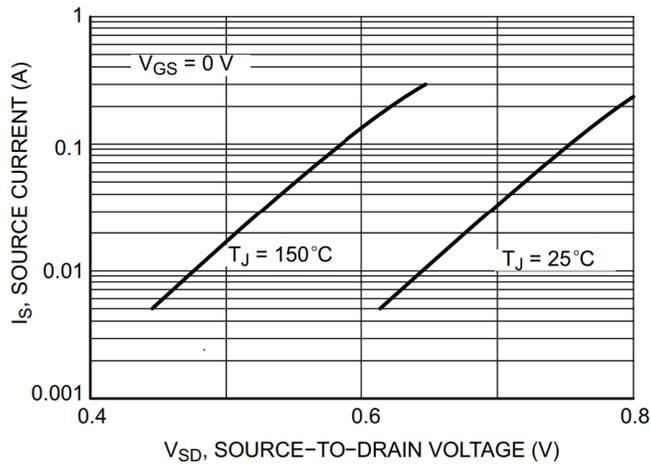
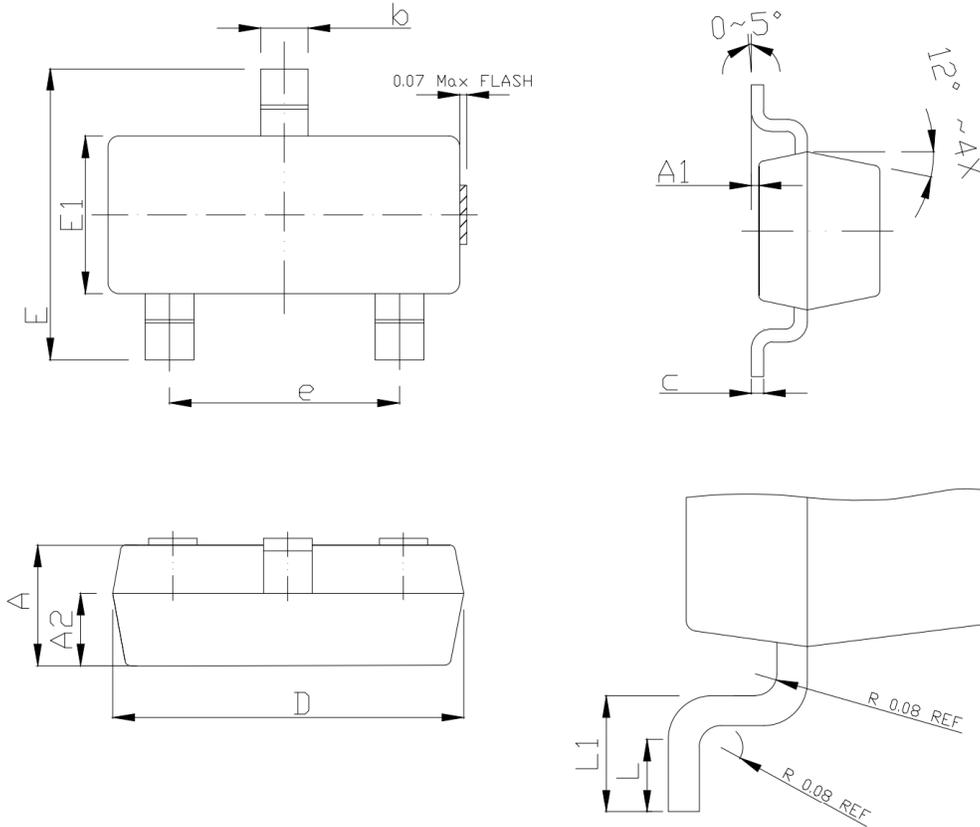


Figure 9. Diode Forward Voltage vs. Current

SOT-23 PACKAGE OUTLINE



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.80	1.00	1.30
A1	0.00	0.05	0.15
b	0.25	0.40	0.55
c	0.11 BSC		
D	2.60	2.90	3.20
E	2.10	2.40	2.70
E1	1.10	1.30	1.48
e	1.90 BSC		
L	0.17	-	-
L1	0.28	0.40	0.53
A2	0.60 REF		

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