

N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)(Max.)	I_D (A) ^a	Q_g (Typ.)
30	1.5 at $V_{GS} = 4.5$ V	0.5	1.15 nC
	2 at $V_{GS} = 2.5$ V		

FEATURES

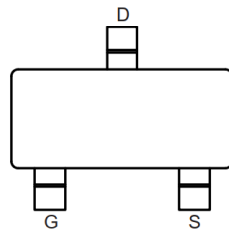
- DT-Trench Power MOSFET
- Low $R_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- EU RoHS Compliant


RoHS
 COMPLIANT

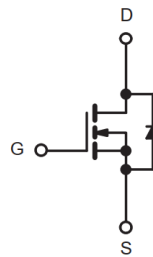
APPLICATIONS

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

SOT-23 Pin Configuration



Top View



N-Channel MOSFET

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	30	V
Gate-Source Voltage		V _{GS}	±20	
Continuous Drain Current ¹ Steady State	T _A =25°C	I _D	0.5	A
	T _A =85°C		0.37	
Continuous Drain Current ¹ t < 10 s	T _A =25°C		0.56	
	T _A =85°C		0.4	
Pulsed Drain Current tp = 10 us		I _{DM}	1.7	
Power Dissipation ¹ Steady State		P _D	0.69	W
Power Dissipation ¹ t < 5 s			0.83	
Thermal Resistance.Junction- to-Ambient- Steady State ¹		R _{thJA}	180	°C/W
Thermal Resistance.Junction- to-Ambient- t < 10 s ¹			150	
Thermal Resistance.Junction- to-Ambient- Steady State ²			300	
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)		T _L	260	°C
Junction Temperature		T _J	150	
Storage Temperature Range		T _{stg}	-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 _{DSS}	I _D =100 μA, V _{GS} =0V	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V, T _J =25°C			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±1	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μA	0.8		1.4	V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V _{DSS} /T _J			40		mV/°C
Negative Threshold Temperature Coefficient	V _{GS(th)} /T _J			3.4		
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4V, I _D =10mA			1.5	Ω
		V _{GS} =2.5V, I _D =10mA			2	
Forward Transconductance	g _{FS}	V _{DS} =3V, I _D =10mA		0.33		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =5V, f=1MHz		21		pF
Output Capacitance	C _{oss}			19.7		
Reverse Transfer Capacitance	C _{rss}			8.1		
Total Gate Charge	Q _{g(TOT)}	V _{GS} =5V, V _{DS} =24V, I _D =0.1A		1.15		nC
Threshold Gate Charge	Q _{g(TH)}			0.15		
Gate Source Charge	Q _{gs}			0.32		
Gate Drain Charge	Q _{gd}			0.23		
Turn-On DelayTime	t _{d(on)}	V _{GS} =4.5V, V _{DS} =5V, I _D =0.1A, R _{GEN} =50 Ω		16.7		ns
Turn-On Rise Time	t _r			47.9		
Turn-Off DelayTime	t _{d(off)}			65.1		
Turn-Off Fall Time	t _f			64.2		
Body Diode Reverse Recovery Time	t _{rr}	I _S = 10mA, dI _S /dt= 8A/ μs		14		
Maximum Body-Diode Continuous Current	I _S				1	A
Diode Forward Voltage	V _{SD}	I _S =10mA, V _{GS} =0V	T _J =25°C		0.7	V
			T _J =125°C	0.45		

■ Typical Characteristics

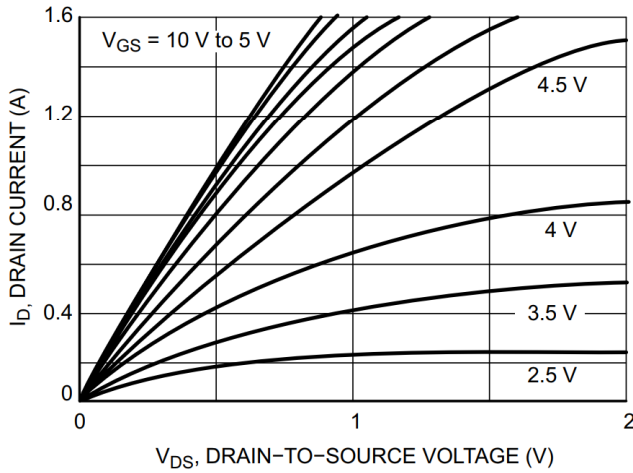


Figure 1. On-Region Characteristics

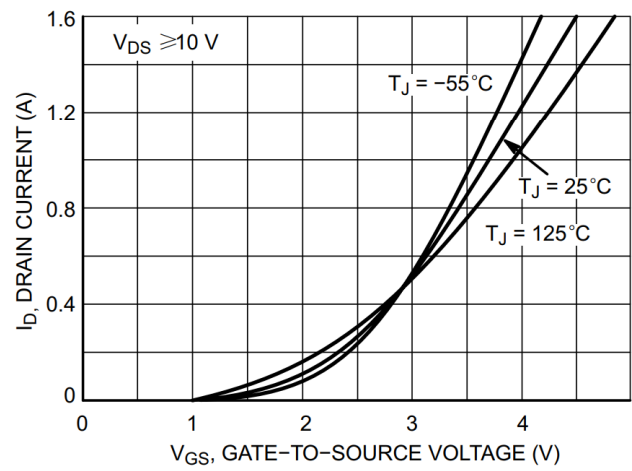


Figure 2. Transfer Characteristics

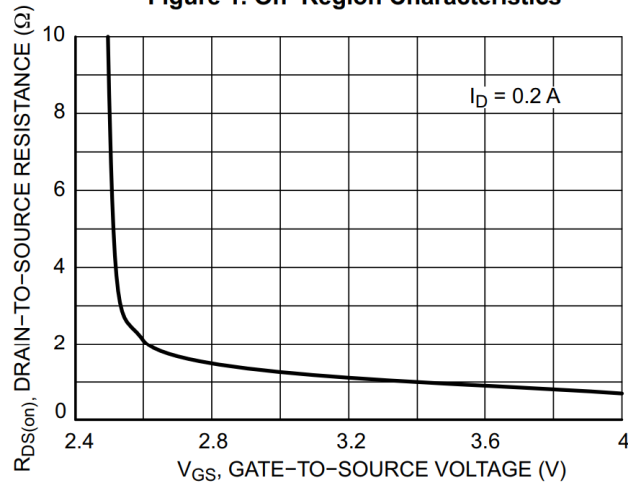


Figure 3. On-Resistance vs. Gate-to-Source Voltage

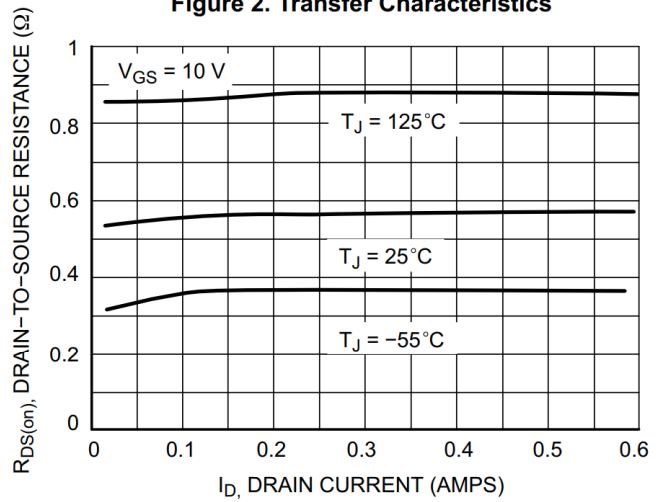


Figure 4. On-Resistance vs. Drain Current and Temperature

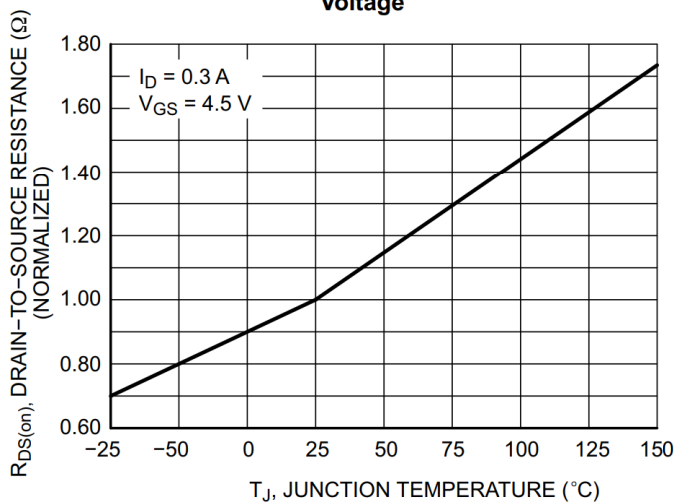


Figure 5. On-Resistance Variation with Temperature

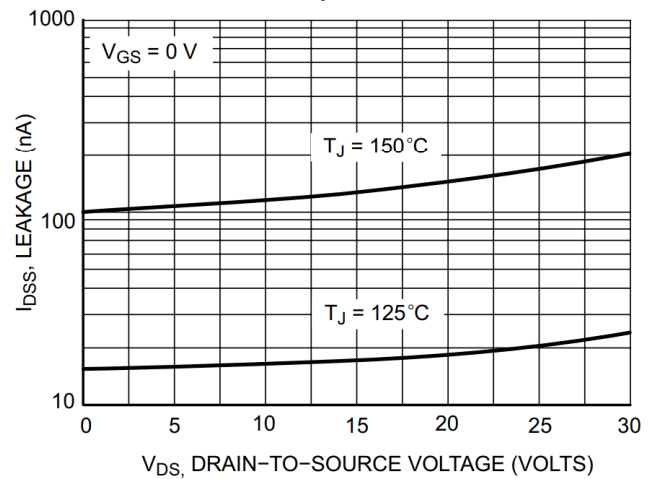


Figure 6. Drain-to-Source Leakage Current vs. Voltage

■ Typical Characteristics

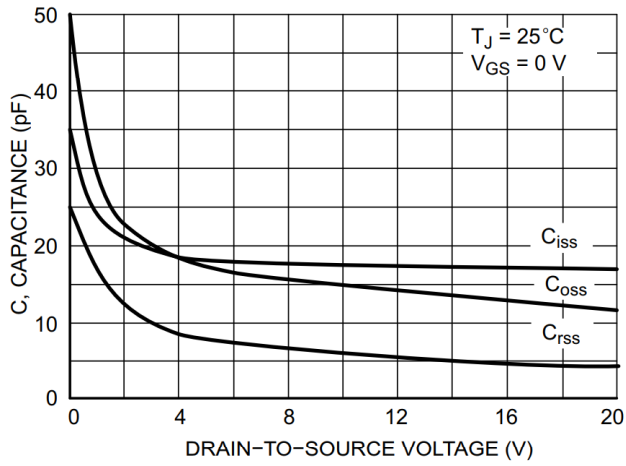


Figure 7. Capacitance Variation

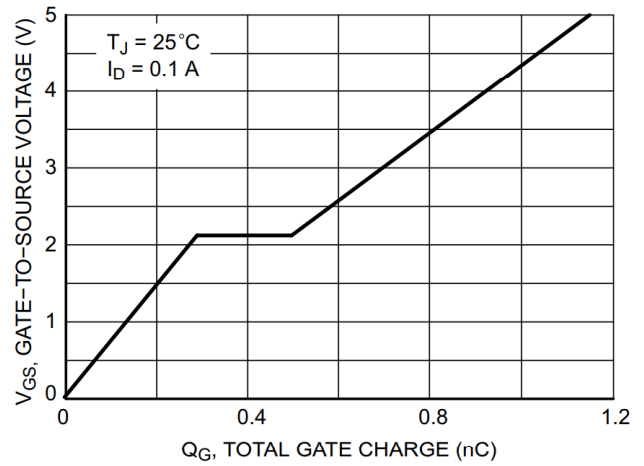


Figure 8. Gate-to-Source & Drain-to-Source Voltage vs. Total Charge

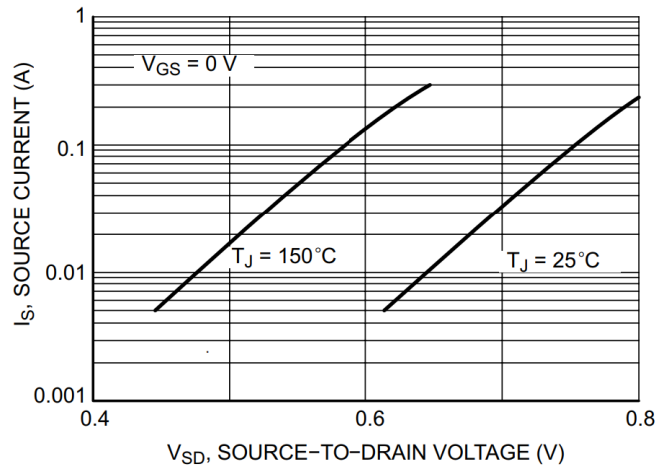
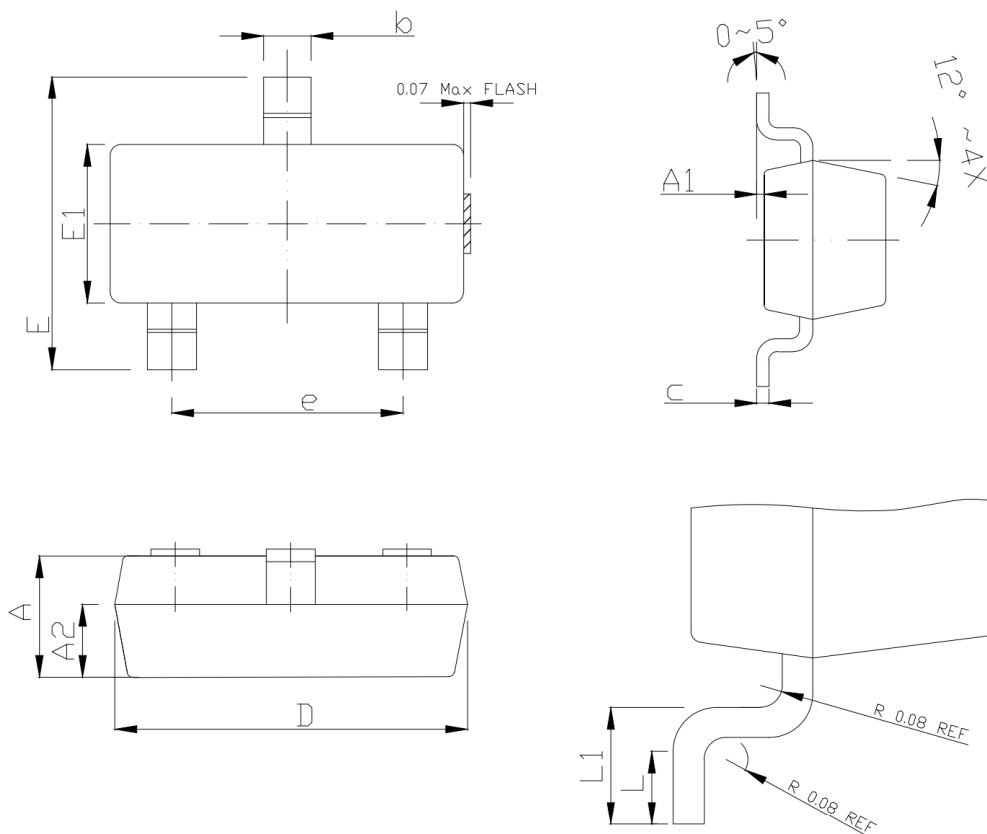


Figure 9. Diode Forward Voltage vs. Current

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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