

Dual N-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY					
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^a	Q _g (Typ.)		
	0.086 at $V_{GS} = 4.5 \text{ V}$	2.6 ^a			
20	0.110 at V _{GS} = 2.5 V	2.5 ^a	5.0 nC		
	0.180 at V _{GS} = 1.8 V	2.3 ^a			

FEATURES

 Halogen-free According to IEC 61249-2-21 Definition

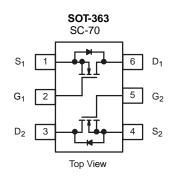


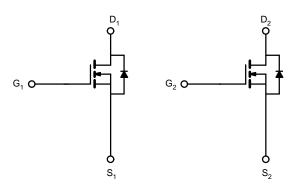
RoHS

- TrenchFET[®] Power MOSFET
- 100 % R_g Tested
- Typical ESD Protection 2100 V HBM
- Compliant to RoHS Directive 2002/95/EC

APPLICATIONS

· Load Switch for Portable Applications





ABSOLUTE MAXIMUM RATINGS	S (T _A = 25 °C, unle	ess otherwise not	ed)		
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	20	V		
Gate-Source Voltage		V _{GS}			± 12
	T _C = 25 °C		2.6 ^a		
Continuous Prais Comment /T 450 %C\	T _C = 70 °C		2.2 ^a		
Continuous Drain Current (T _J = 150 °C)	T _A = 25 °C	I _D	2.3 ^{a, b, c}		
	T _A = 70 °C		1.8 ^{b, c}	A	
Pulsed Drain Current		I _{DM}	8		
Continuous Source-Drain Diode Current	T _C = 25 °C	1	2.3		
	T _A = 25 °C	l _s —	2.10 ^{b, c}	1	
Maximum Power Dissipation	T _C = 25 °C		2.70		
	T _C = 70 °C	В	1.70	10/	
	T _A = 25 °C	P _D	1.5 ^{b, c}	W	
	T _A = 70 °C		1.0 ^{b, c}		
Operating Junction and Storage Temperature Ra	T _J , T _{stg}	- 55 to 150	°C		

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^{b, d}	t ≤ 5 s	R _{thJA}	130	170	°C/W	
Maximum Junction-to-Foot (Drain)	Steady State	R _{thJF}	80	100		

Notes:

- a. Package limited.
- b. Surface mounted on 1" x 1" FR4 board.
- c.t = 5.s.
- d. Maximum under steady state conditions is 220 °C/W.

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V, I}_{D} = 250 \mu\text{A}$	20			V	
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	In = 250 µA		20		mV/°C	
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 2.3			
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	0.5		2.0	V	
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 8 V			± 25	μА	
		$V_{DS} = 0 \text{ V}, V_{GS} = \pm 4.5 \text{ V}$			1		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V			1	μA	
		$V_{DS} = 20 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 \text{ °C}$			10		
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \le 5 \text{ V}, V_{GS} = 4.5 \text{ V}$	4			Α	
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, I_D = 1 \text{ A}$		0.086			
		$V_{GS} = 2.5 \text{ V}, I_D = 1 \text{ A}$		0.110		Ω	
		$V_{GS} = 1.8 \text{ V}, I_D = 0.2 \text{ A}$		0.180			
Forward Transconductance ^a	9 _{fs}	$V_{DS} = 4 \text{ V}, I_{D} = 1.5 \text{ A}$		4		S	
Dynamic ^b							
Total Gate Charge	Q_g	$V_{DS} = 10 \text{ V}, V_{GS} = 8 \text{ V}, I_{D} = 1.5 \text{ A}$		5.0		nC	
				3.0			
Gate-Source Charge	Q_{gs}	$V_{DS} = 10 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 1.5 \text{ A}$		1.0			
Gate-Drain Charge	Q_{gd}			2.0			
Gate Resistance	R _g	f = 1 MHz	0.4	1.9	3.8	kΩ	
Turn-On Delay Time	t _{d(on)}			43	65		
Rise Time	t _r	V_{DD} = 10 V, R_L = 8.3 Ω		80	120	ns	
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 1.2 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \Omega$		480	720		
Fall Time	t _f			220	330		
Turn-on Delay Time	t _{d(on)}			22	33		
Rise Time	tr	V_{DD} = 10 V, R_L = 8.3 Ω		46	70		
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 1.2 \text{ A}, V_{GEN} = 8 \text{ V}, R_g = 1 \Omega$		645	968		
Fall Time	tr			215	323		
Drain-Source Body Diode Characteristic	cs						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C		2.6		۸	
Pulse Diode Forward Current	I _{SM}			4		A	
Body Diode Voltage	V_{SD}	I _S = 1.2 A, V _{GS} = 0 V		0.8	1.2	V	
Body Diode Reverse Recovery Time	t _{rr}			9	18	ns	
Body Diode Reverse Recovery Charge	Q _{rr}			2	4	nC	
Reverse Recovery Fall Time	t _a	$I_F = 1.2 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 °C$		5		ns	
Reverse Recovery Rise Time	t _b			4			

Notes:

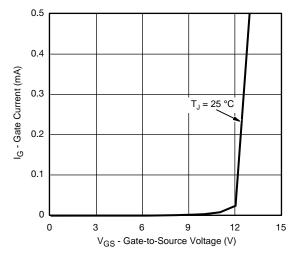
- a. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.
- b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

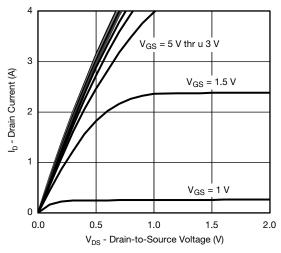
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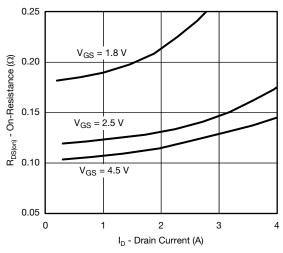
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



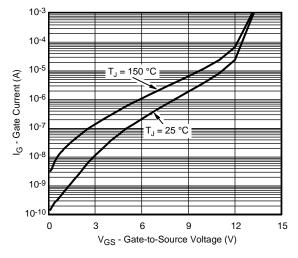
Gate Current vs. Gate-to-Source Voltage



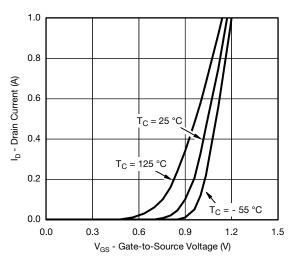
Output Characteristics



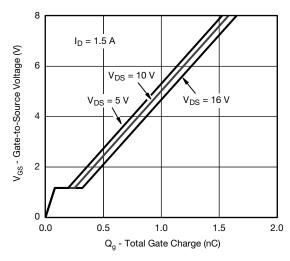
On-Resistance vs. Drain Current



Gate Current vs. Gate-to-Source Voltage



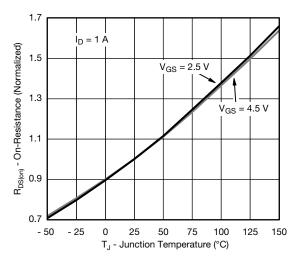
Transfer Characteristics



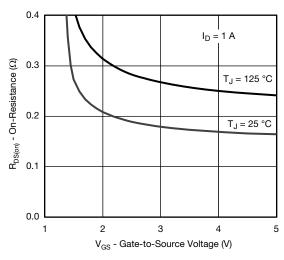
Gate Charge



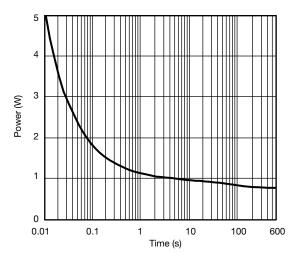
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



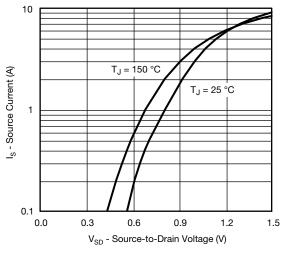
On-Resistance vs. Junction Temperature



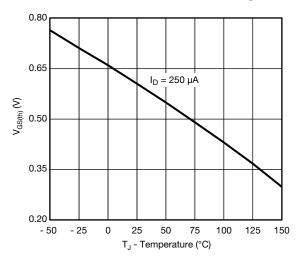
On-Resistance vs. Gate-to-Source Voltage



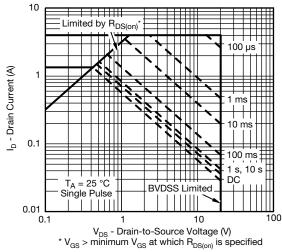
Single Pulse Power, Junction-to-Ambient



Source-Drain Diode Forward Voltage



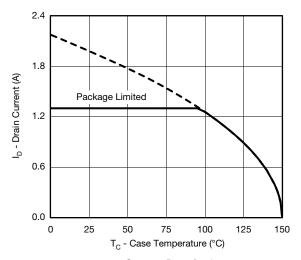
Threshold Voltage



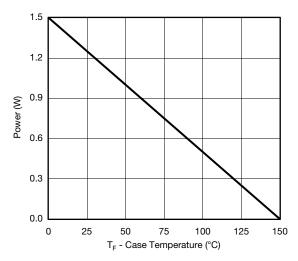
Safe Operating Area, Junction-to-Ambient



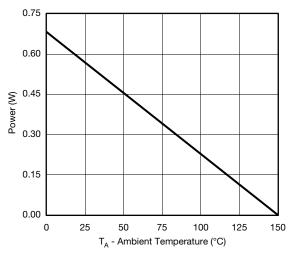
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating*







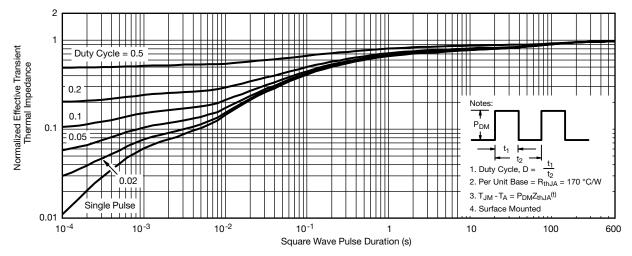
Power, Junction-to-Ambient

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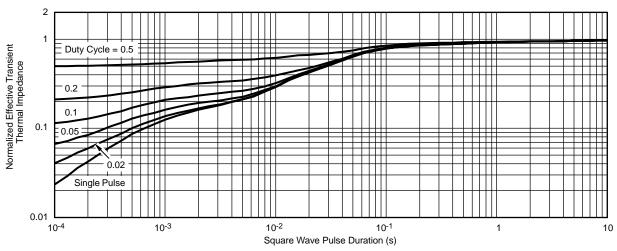
^{*} The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



TYPICAL CHARACTERISTICS (25 C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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