

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

PRODUCT SUMMARY						
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^a	Q _g (Typ.)			
- 20	0.155 at V _{GS} = - 4.5V	- 1.8	2.7 nC			
	0.235 at V _{GS} = - 2.5 V	- 1.5	2.7 110			

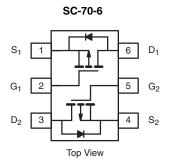
FEATURES

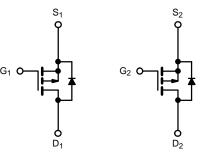
 Halogen-free According to IEC 61249-2-21 Definition



RoHS

- TrenchFET® Power MOSFET
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC





P-Channel MOSFET

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Parameter	Symbol	Limit	Unit		
Drain-Source Voltage		V _{DS}	- 20	V	
Gate-Source Voltage		V_{GS}	± 12	v	
	T _C = 25 °C		- 1.8		
Continuous Proin Current (T = 150 °C)	T _C = 70 °C	- I _D	- 1.5		
Continuous Drain Current (T _J = 150 °C)	T _A = 25 °C		- 1.6 ^{b, c}		
	T _A = 70 °C		-1.1 ^{b, c}	A	
Pulsed Drain Current		I _{DM}	- 2.5		
	T _C = 25 °C		- 1.17		
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	- 0.95 ^{b, c}		
Maximum Power Dissipation	T _C = 25 °C	P _D	1.4		
	T _C = 70 °C		0.9	10/	
	T _A = 25 °C		1.14 ^{b, c}	W	
	T _A = 70 °C		0.73 ^{b, c}		
Operating Junction and Storage Temperature Range		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}	93	110	°C/W	
Maximum Junction-to-Foot	Steady State	R _{thJF}	75	90		

Notes:

- a. $T_C = 25 \,^{\circ}C$.
- b. Surface mounted on 1" x 1" FR4 board.
- c. t = 5 s
- d. Maximum under steady state conditions is 150 °C/W.



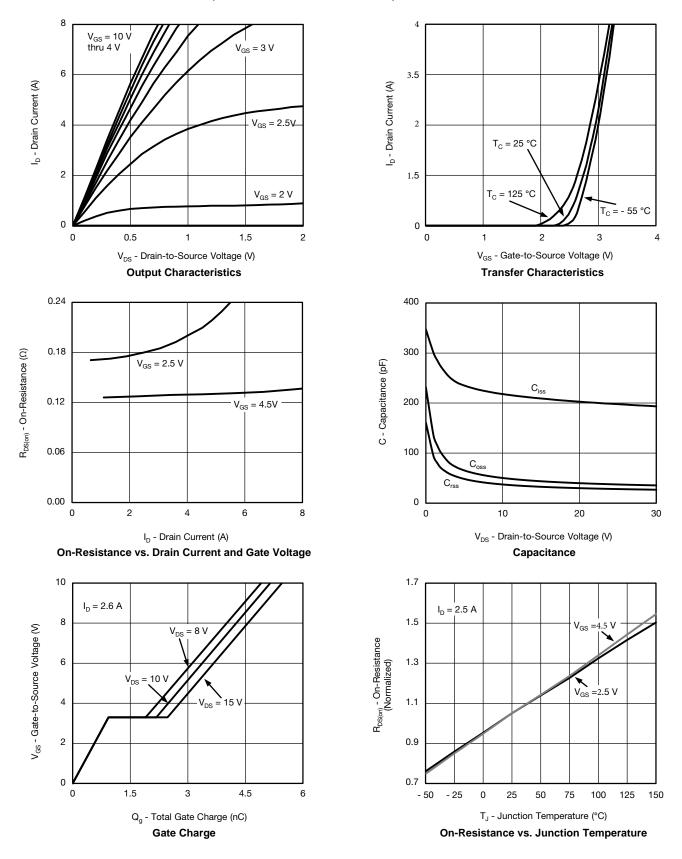
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static		<u> </u>			•	•	
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 20			V	
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	I _D = - 250 μΑ		- 17		mV/°C	
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_{J}$	ι _D = - 250 μΑ		3.5			
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}$, $I_{D} = -250 \mu A$	- 0.5		- 1.5	V	
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 12 \text{ V}$			± 100	nA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 20 V, V _{GS} = 0 V			1	4	
		V _{DS} = - 20 V, V _{GS} = 0 V, T _J = 55 °C			10	μA	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \le -5 \text{ V}, V_{GS} = -4.5 \text{V}$	- 8			Α	
	Ь	$V_{GS} = -4.5V$, $I_D = -2.5 A$		0.155		Ω	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 2.5 V, I _D = - 1 A		0.235			
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 15 V, I _D = - 2.6 A		5		S	
Dynamic ^b					l		
Input Capacitance	C _{iss}			210		pF	
Output Capacitance	C _{oss}	V _{DS} = - 15 V, V _{GS} = 0 V, f = 1 MHz		45			
Reverse Transfer Capacitance	C _{rss}			33			
	$V_{DS} = -15 \text{ V}, V_{CS} = -4.5 \text{ V}, I_{DS} = -4.5 \text{ V}$	V _{DS} = - 15 V, V _{GS} = - 4.5 V, I _D = - 2.6 A		5.2	8	nC	
Total Gate Charge				2.7	4		
Gate-Source Charge	Q _{gs}	$V_{DS} = -15 \text{ V}, V_{GS} = -4.5 \text{ V}, I_{D} = -2.6 \text{ A}$		0.94			
Gate-Drain Charge	Q _{gd}			1.3			
Gate Resistance	R_g	f = 1 MHz	2	7	14	Ω	
Turn-On Delay Time	t _{d(on)}			39	59	ns	
Rise Time	t _r	$V_{DD} = -15 \text{ V}, R_{L} = 7.1 \Omega$		25	38		
Turn-Off Delay Time	t _{d(off)}	$I_D \cong$ - 2.1 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		13	20		
Fall Time	t _f			9	18		
Turn-On Delay Time	t _{d(on)}			5	10		
Rise Time	t _r	$V_{DD} = -15 \text{ V}, R_{L} = 7.1 \Omega$		10	20		
Turn-Off Delay Time	t _{d(off)}	$I_D \cong$ - 2.1 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		14	21		
Fall Time	t _f			7	14		
Drain-Source Body Diode Characteristi	cs				•		
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C		1.17		A	
Pulse Diode Forward Current	I _{SM}			8			
Body Diode Voltage	V_{SD}	I _S = - 2.1 A, V _{GS} = 0 V		0.85	1.2	V	
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 2.1 A, dI/dt = 100 A/μs, T _J = 25 °C		13	20	ns	
Body Diode Reverse Recovery Charge	Q _{rr}			6	12	nC	
Reverse Recovery Fall Time	t _a			9			
Reverse Recovery Rise Time	t _b	1		4		ns	

Notes:

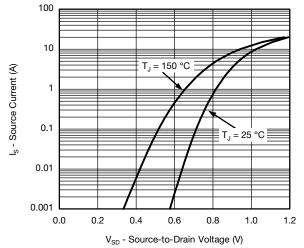
- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%$
- b. Guaranteed by design, not subject to production testing.

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.

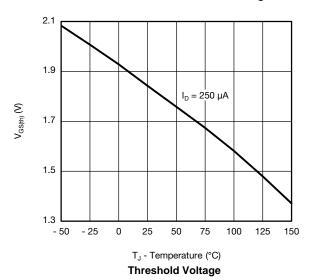


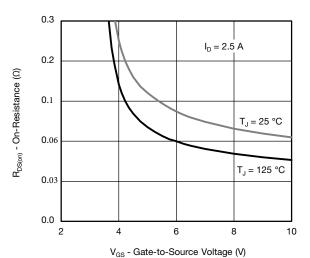




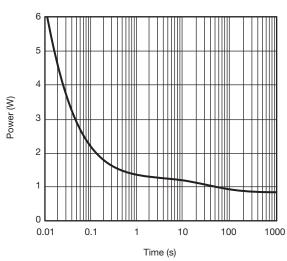


Source-Drain Diode Forward Voltage

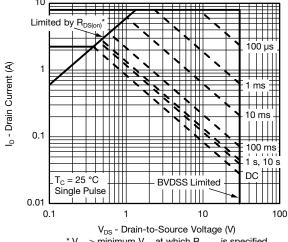




On-Resistance vs. Gate-to-Source Voltage



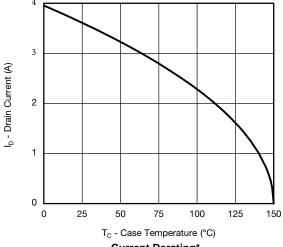
Single Pulse Power (Junction-to-Ambient)



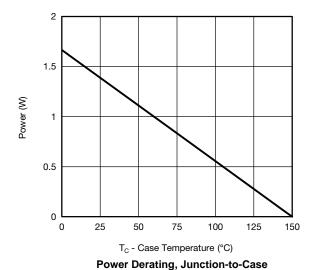
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

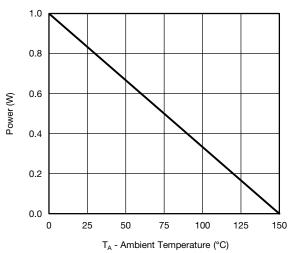
Safe Operating Area, Junction-to-Ambient





Current Derating*

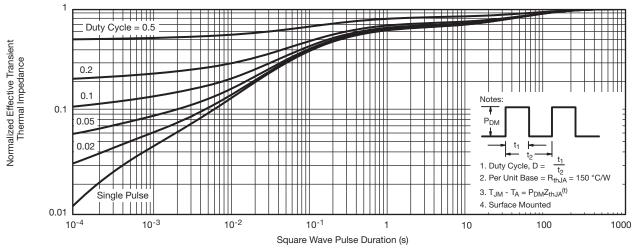




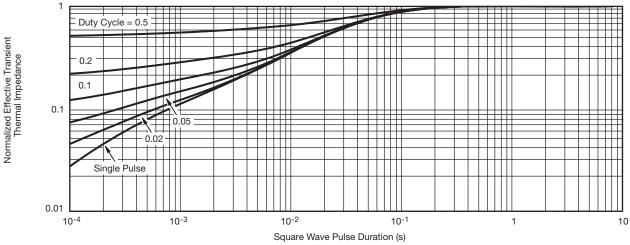
Power Derating, Junction-to-Ambient

^{*} 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.





Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot



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