

N-Channel 60-V (D-S) MOSFET

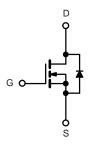
PRODUCT SUMMARY					
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^a			
60	0.011 at V _{GS} = 10 V	60			
00	0.012 at V _{GS} = 4.5 V	50			

FEATURES

- 175 °C Junction Temperature
- TrenchFET® Power MOSFET
- Material categorization:







N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)						
Parameter	Symbol	Limit	Unit			
Gate-Source Voltage	V_{GS}	± 20	V			
Continuous Drain Current (T _{.I} = 175 °C) ^b	T _C = 25 °C	I.	60			
Continuous Diain Current (1 _J = 175 °C) ²	T _C = 100 °C	l _D	50 ^a			
Pulsed Drain Current	I _{DM}	200	Α			
Continuous Source Current (Diode Conduction)	I _S	50 ^a				
Avalanche Current	I _{AS}	I _{AS} 50				
Single Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E _{AS}	125	mJ		
Maximum Power Dissipation	T _C = 25 °C	P _D	136	W		
Maximum Fower Dissipation	T _A = 25 °C	' D	3 ^b , 8.3 ^{b, c}			
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 175	°C		

THERMAL RESISTANCE RATINGS							
Parameter		Symbol	Typical	Maximum	Unit		
Marian and Luncking to Ambient	t ≤ 10 sec	P	15	18	°C/W		
Maximum Junction-to-Ambient ^a	Steady State	R_{thJA}	40	50			
Maximum Junction-to-Case		R _{thJC}	0.85	1.1			

Notes:

- a. Package limited.
- b. Surface mounted on 1" x 1" FR4 board.
- $c.\ t \leq 10\ s.$



Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit	
Static					<u> </u>		
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	60			V	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1		3		
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
		V _{DS} = 60 V, V _{GS} = 0 V			1		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V, T _J = 125 °C			50	50 μA 250	
		V _{DS} = 60 V, V _{GS} = 0 V, T _J = 175 °C			250		
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	60			Α	
		V _{GS} = 10 V, I _D = 20 A		0.011			
D : 0	D	V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C		0.014		0	
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C		0.018	Ω		
		$V_{GS} = 4.5 \text{ V}, I_D = 15 \text{ A}$	0.012			1	
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 20 A		60		S	
Dynamic			•				
Input Capacitance	C _{iss}			3650		pF	
Output Capacitance	C _{oss}	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		570			
Reverse Transfer Capacitance	C _{rss}			325			
Total Gate Charge ^c	Qg			47			
Gate-Source Charge ^c	Q_{gs}	$V_{DS} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 50 \text{ A}$		10		nC	
Gate-Drain Charge ^c	Q _{gd}			12			
Turn-On Delay Time ^c	t _{d(on)}			10	20		
Rise Time ^c	t _r	V_{DD} = 30 V, R_L = 0.6 Ω I_D \cong 50 A, V_{GEN} = 10 V, R_g = 2.5 Ω		15	25		
Turn-Off Delay Time ^c	t _{d(off)}			35	50	ns	
Fall Time ^c	t _f			20	30		
Source-Drain Diode Ratings and Cha	aracteristics (T _C = 25 °C)		•			
Pulsed Current	I _{SM}				60	Α	
Diode Forward Voltage	V_{SD}	I _F = 20 A, V _{GS} = 0 V		1	1.5	V	
Reverse Recovery Time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs		45	100	ns	

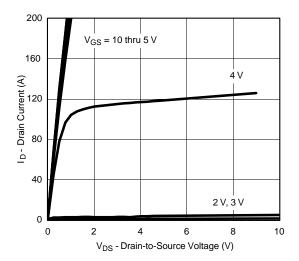
Notes:

- a. For design aid only; not subject to production testing.
- b. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.
- c. Independent of operating temperature.

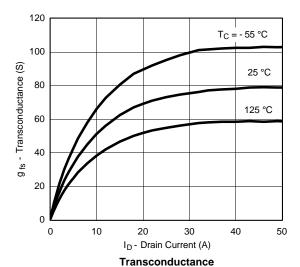
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

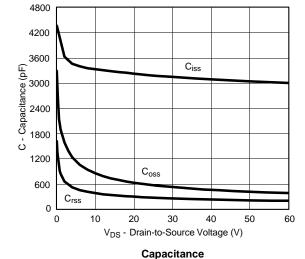


TYPICAL CHARACTERISTICS (25 °C unless noted)



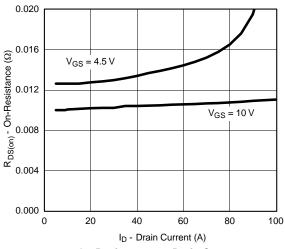
Output Characteristics



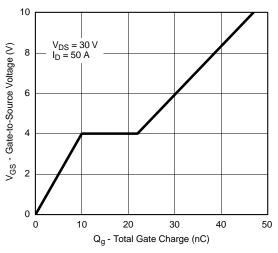


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Transfer Characteristics



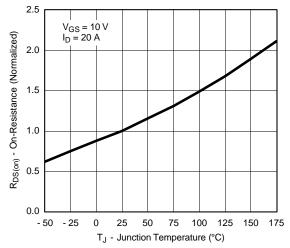
On-Resistance vs. Drain Current



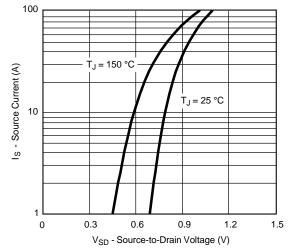
Gate Charge



TYPICAL CHARACTERISTICS (25 °C unless noted)



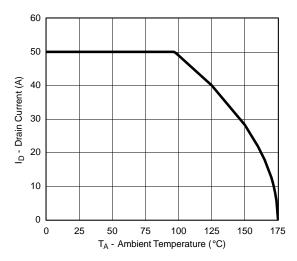
On-Resistance vs. Junction Temperature

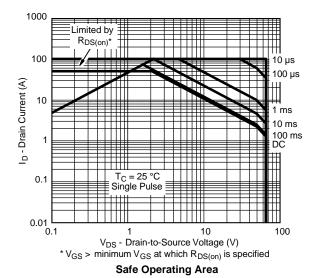


Source-Drain Diode Forward Voltage

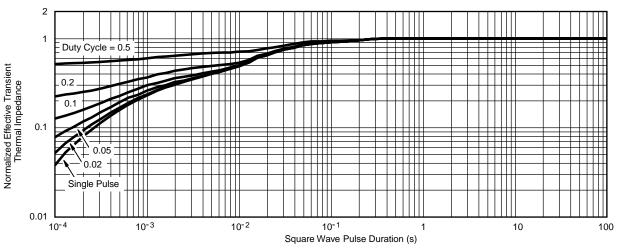


THERMAL RATINGS





Maximum Drain Current vs. Ambient Temperature



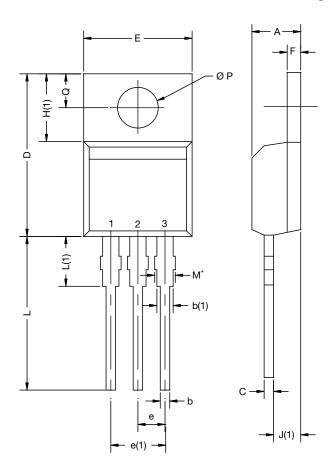
Normalized Thermal Transient Impedance, Junction-to-Case

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DIM.	MILLIM	IETERS	INCHES			
	MIN.	MAX.	MIN.	MAX.		
Α	4.24	4.65	0.167	0.183		
b	0.69	1.02	0.027	0.040		
b(1)	1.14	1.78	0.045	0.070		
С	0.36	0.61	0.014	0.024		
D	14.33	15.85	0.564	0.624		
E	9.96	10.52	0.392	0.414		
е	2.41	2.67	0.095	0.105		
e(1)	4.88	5.28	0.192	0.208		
F	1.14	1.40	0.045	0.055		
H(1)	6.10	6.71	0.240	0.264		
J(1)	2.41	2.92	0.095	0.115		
L	13.36	14.40	0.526	0.567		
L(1)	3.33	4.04	0.131	0.159		
ØΡ	3.53	3.94	0.139	0.155		
Q	2.54	3.00	0.100	0.118		
ECN: X15-0364-Rev. C, 14-Dec-15 DWG: 6031						

Note

 \bullet $\,$ M* $\,=\,$ 0.052 inches to 0.064 inches (dimension including protrusion), heatsink hole for HVM



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