

P-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 60	0.158 at $V_{GS} = - 10$ V	- 12
	0.210 at $V_{GS} = - 4.5$ V	- 8.7

FEATURES

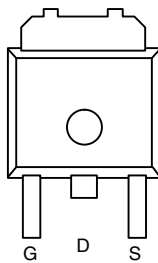
- DT-Trench Power MOSFET
- 100% R_g and UIS Tested

APPLICATIONS

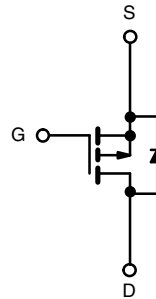
- Load Switch
- Notebook Adaptor Switch


RoHS
 COMPLIANT

TO-252



Top View



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C)	I_D	$T_C = 25$ °C - 12 ^d	A
		$T_C = 125$ °C - 9.2	
Pulsed Drain Current	I_{DM}	- 48	
Avalanche Current	I_{AS}	- 15	mJ
Single Pulse Avalanche Energy ^a	E_{AS}	25	
Power Dissipation	P_D	$T_C = 25$ °C 50 ^c	W
		$T_A = 25$ °C 2.7 ^{b, c}	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^b	R_{thJA}	$t \leq 10$ s 20	25	°C/W
		Steady State 65	75	
Junction-to-Case	R_{thJC}	4.5	7.1	

Notes:

- Duty cycle ≤ 1 %.
- When mounted on 1" square PCB (FR-4 material).
- See SOA curve for voltage derating.
- Package limited.

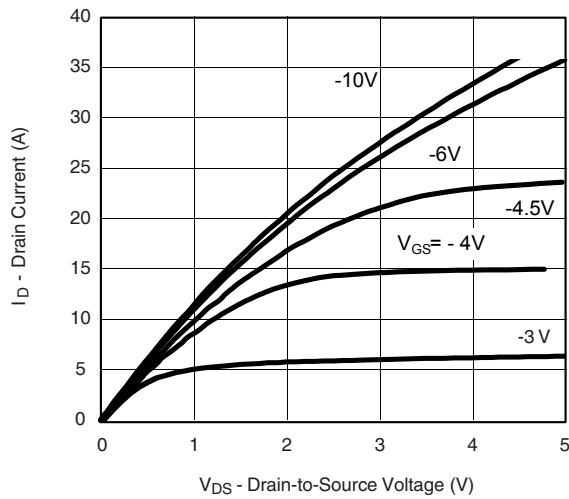
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1		- 3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 48 V, V _{GS} = 0 V			- 1	μA
		V _{DS} = - 48 V, V _{GS} = 0 V, T _J = 125 °C			- 50	
		V _{DS} = - 48 V, V _{GS} = 0 V, T _J = 150 °C			- 100	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = - 5 V, V _{GS} = - 10 V	- 12			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 8 A		0.158	0.175	Ω
		V _{GS} = - 10 V, I _D = - 8 A, T _J = 125 °C			0.238	
		V _{GS} = - 10 V, I _D = - 8 A, T _J = 150 °C			0.259	
		V _{GS} = - 4.5 V, I _D = - 5 A		0.210	0.252	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 5 V, I _D = - 8 A		11		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = - 25 V, f = 1 MHz		625		pF
Output Capacitance	C _{oss}			110		
Reverse Transfer Capacitance	C _{rss}			55		
Total Gate Charge ^c	Q _g	V _{DS} = - 30 V, V _{GS} = - 10 V, I _D = - 8 A		20	29	nC
Gate-Source Charge ^c	Q _{gs}			12		
Gate-Drain Charge ^c	Q _{gd}			13		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = - 30 V, R _L = 0.6 Ω I _D ≐ - 8 A, V _{GEN} = - 10 V, R _G = 6 Ω		11		ns
Rise Time ^c	t _r			15		
Turn-Off Delay Time ^c	t _{d(off)}			35		
Fall Time ^c	t _f			15		
Source-Drain Diode Ratings and Characteristics T _C = 25 °C ^b						
Continuous Current	I _S				- 12	A
Pulsed Current	I _{SM}				- 48	
Forward Voltage ^a	V _{SD}	I _F = - 8 A, V _{GS} = 0 V		- 1	- 1.6	V
Reverse Recovery Time	t _{rr}	I _F = - 8 A, dI/dt = 100 A/μs		25	33	ns

Notes:

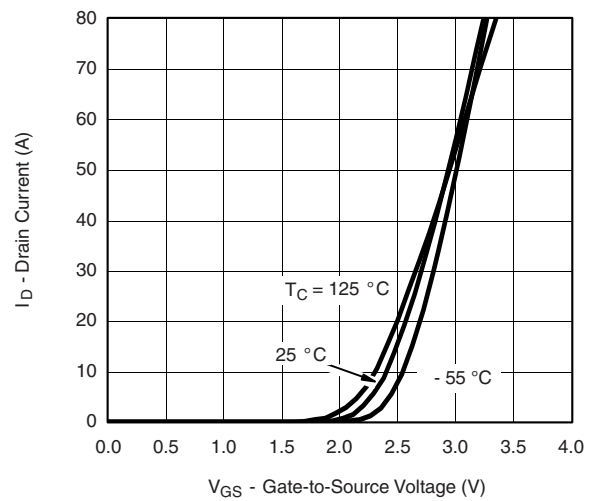
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

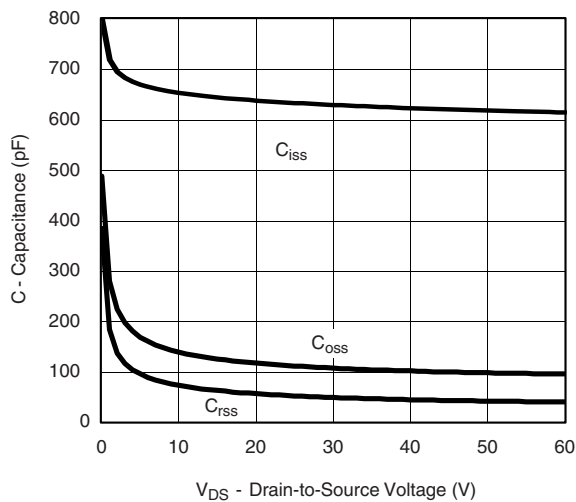
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



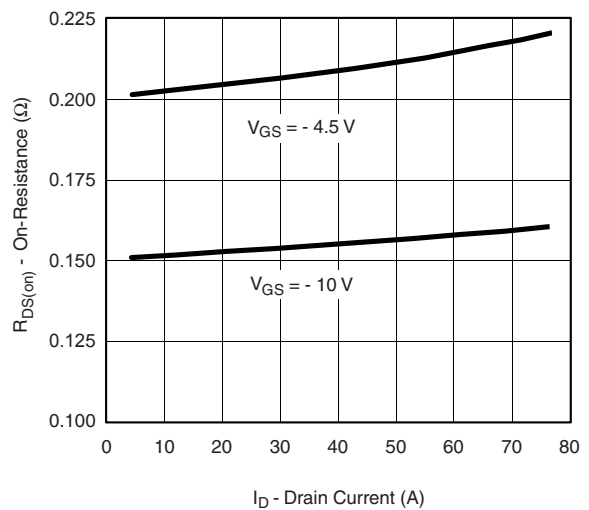
Output Characteristics



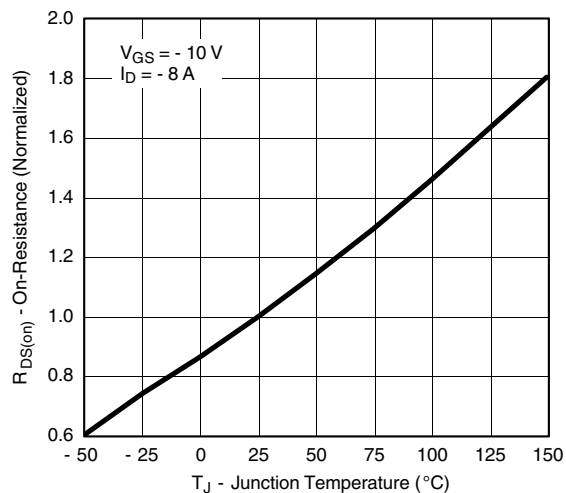
Transfer Characteristics



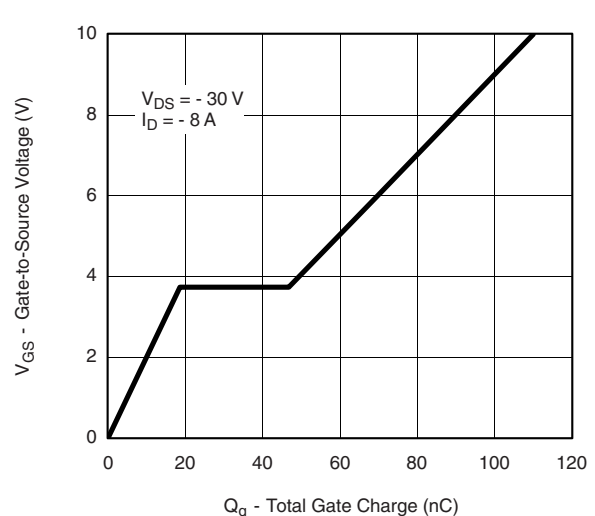
Capacitance



On-Resistance vs. Drain Current

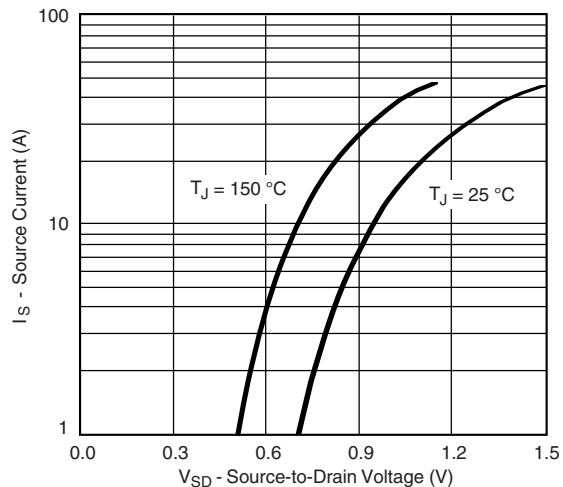


On-Resistance vs. Junction Temperature

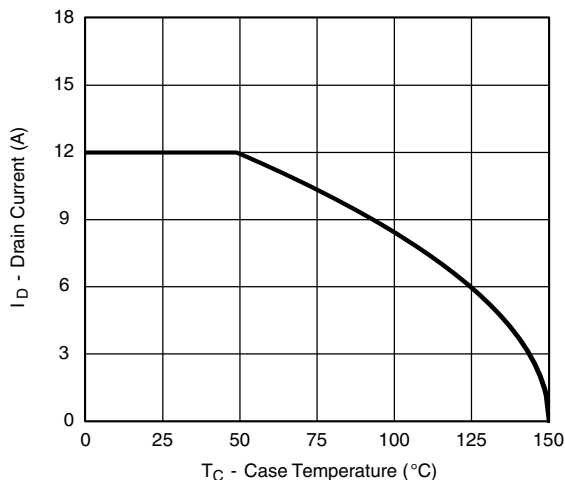


Gate Charge

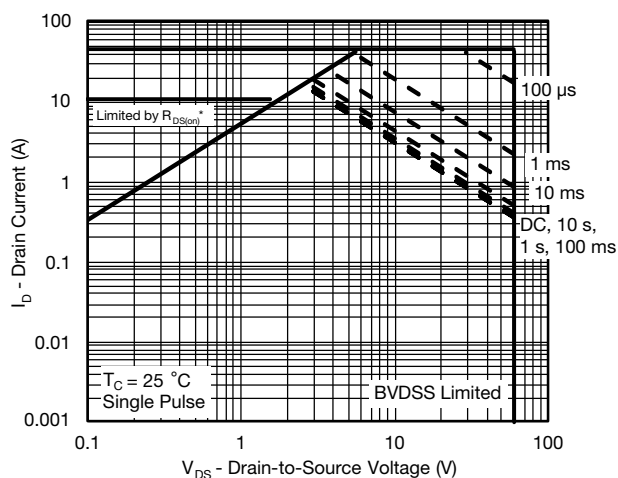
TYPICAL CHARACTERISTICS



Source-Drain Diode Forward Voltage

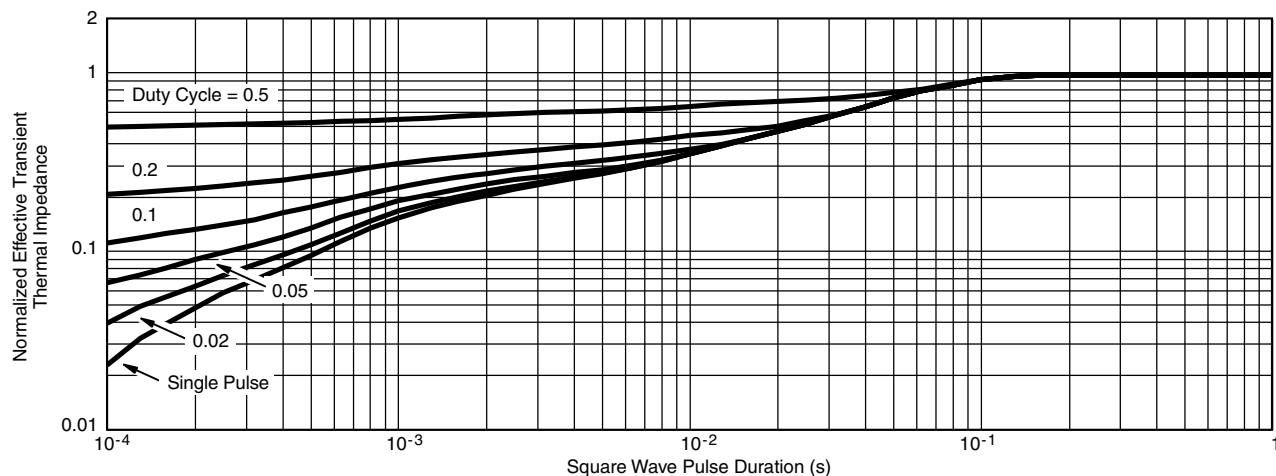


Drain Current vs. Case Temperature



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

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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