

N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
100	0.105 at $V_{GS} = 10$ V	4.2
	0.115 at $V_{GS} = 4.5$ V	3.9

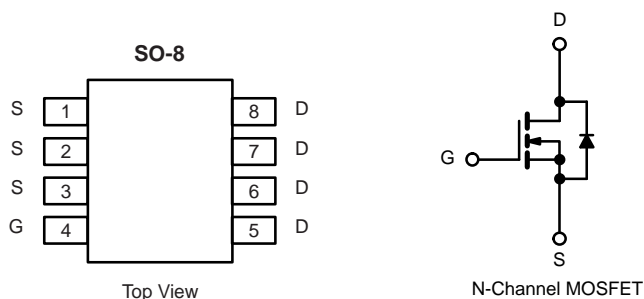
FEATURES

- DT-Trench Power MOSFET
- 175 °C Junction Temperature
- 100 % R_g Tested


RoHS
 COMPLIANT

APPLICATIONS

- Load Switch
- LED Backlighting in LCD TVs



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C) ^b	I_D	4.2	A
		3.2	
Pulsed Drain Current	I_{DM}	12.6	
Continuous Source Current (Diode Conduction)	I_S	4.5	
Avalanche Current	I_{AR}	4.5	
Repetitive Avalanche Energy (Duty Cycle ≤ 1 %)	$L = 0.1$ mH E_{AR}	1.8	mJ
Maximum Power Dissipation	P_D	4.8 ^b	W
		2.4 ^a	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^a	R_{thJA}	40	51	°C/W
		18	25	
Junction-to-Case	R_{thJC}	2	2.4	

Notes:

a. Surface mounted on 1" x 1" FR4 board.

b. See SOA curve for voltage derating.

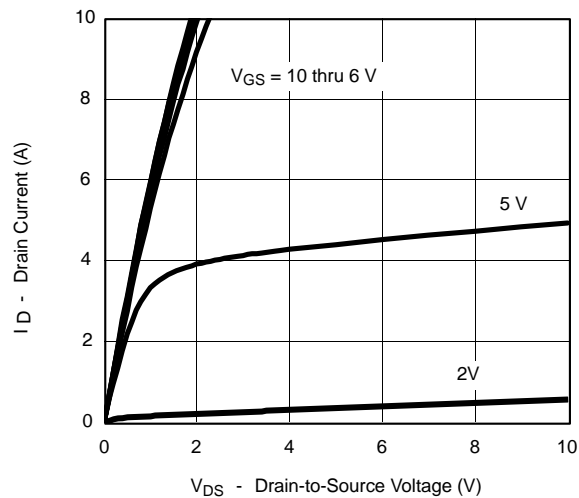
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	100			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1		3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 80 V, V _{GS} = 0 V			1	μA
		V _{DS} = 80 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 80 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			12.6	A
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 2.7 A		0.105	0.117	Ω
		V _{GS} = 10 V, I _D = 2.5 A, T _J = 125 °C			0.129	
		V _{GS} = 10 V, I _D = 2.5 A, T _J = 175 °C			0.134	
		V _{GS} = 4.5 V, I _D = 2.5 A		0.115	0.128	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 2.5 A		7		S
Dynamic ^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 80 V, f = 1 MHz		1561		pF
Output Capacitance	C _{oss}			110		
Reverse Transfer Capacitance	C _{rss}			65		
Total Gate Charge ^c	Q _g	V _{DS} = 80 V, V _{GS} = 10 V, I _D = 15 A		7	11	nC
Gate-Source Charge ^c	Q _{gs}			2.1		
Gate-Drain Charge ^c	Q _{gd}			2.6		
Gate Resistance	R _g			3		Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 80 V, R _L = 5 Ω I _D ≅ 15 A, V _{GEN} = 10 V, R _G = 2.5 Ω		10		ns
Rise Time ^c	t _r			16		
Turn-Off Delay Time ^c	t _{d(off)}			11		
Fall Time ^c	t _f			15		
Source-Drain Diode Ratings and Characteristic (T _C = 25 °C)						
Pulsed Current	I _{SM}				12.6	A
Diode Forward Voltage ^b	V _{SD}	I _F = 15 A, V _{GS} = 0 V		0.8	1.2	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 15 A, dI/dt = 100 A/μs		50	80	ns

Notes:

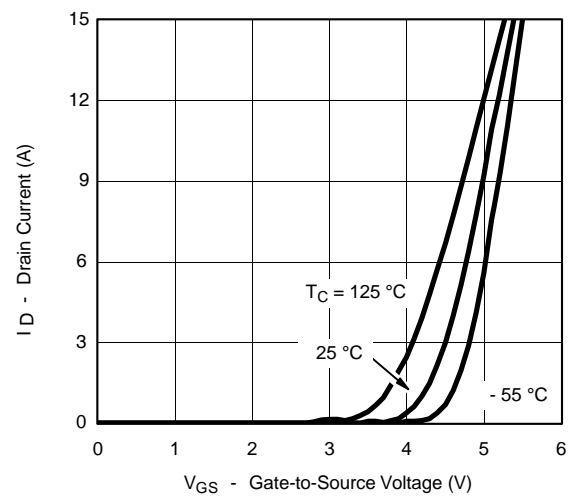
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

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.

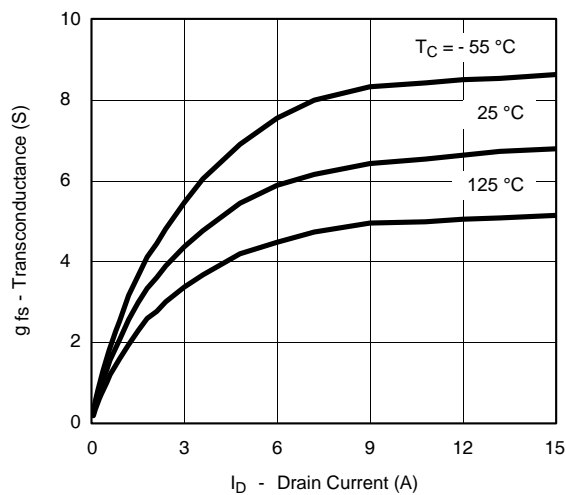
TYPICAL CHARACTERISTICS (25 °C unless noted)



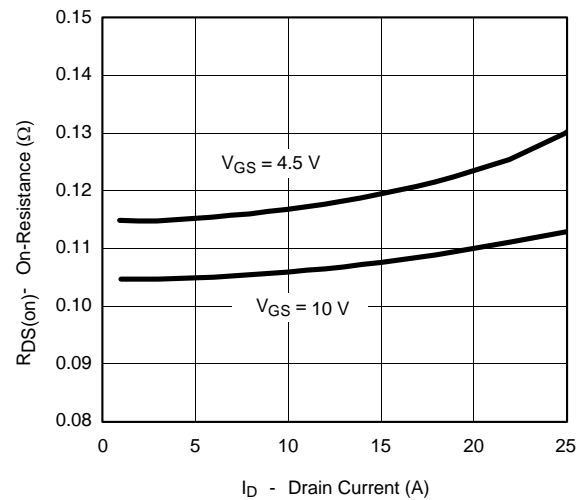
Output Characteristics



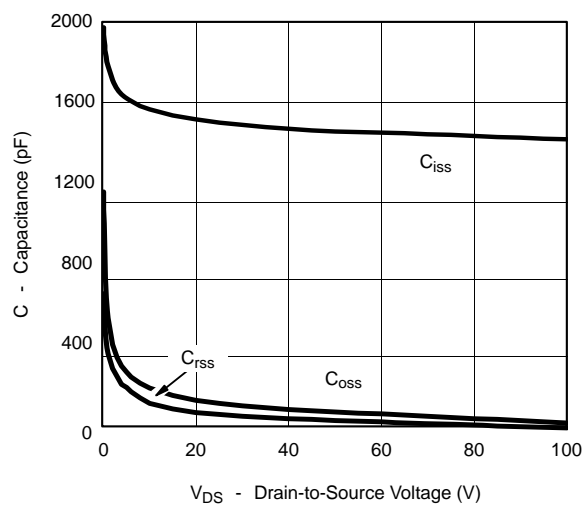
Transfer Characteristics



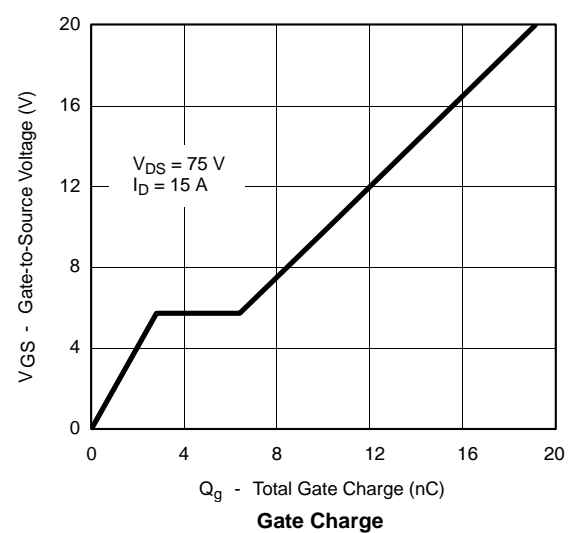
Transconductance



On-Resistance vs. Drain Current

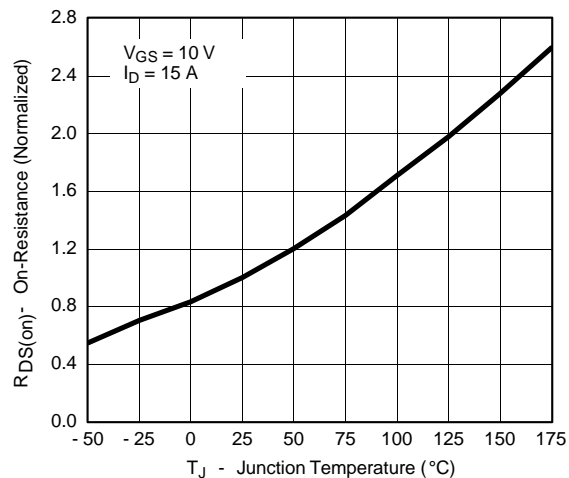


Capacitance

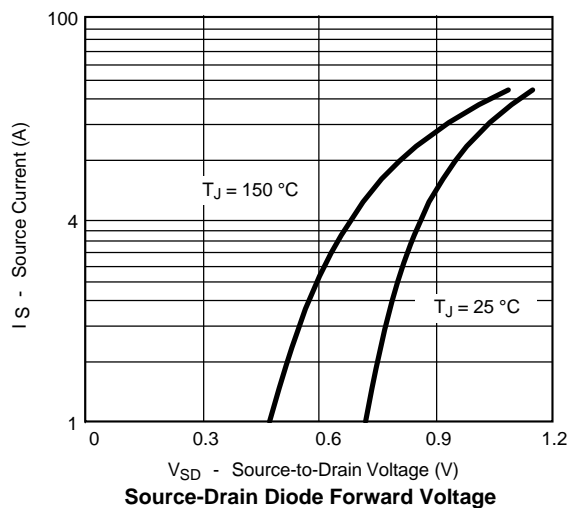


Gate Charge

TYPICAL CHARACTERISTICS (25 °C unless noted)

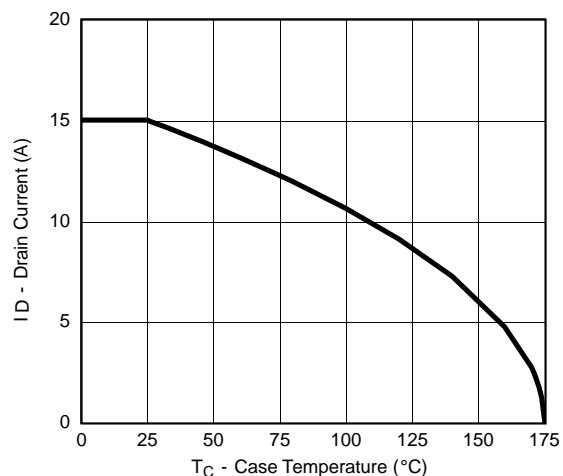


On-Resistance vs. Junction Temperature

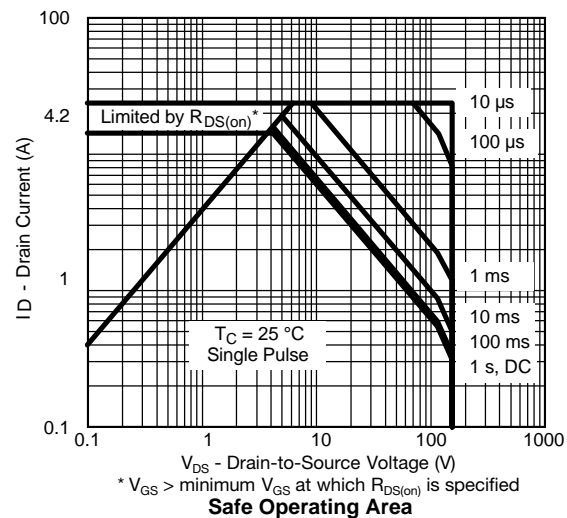


Source-Drain Diode Forward Voltage

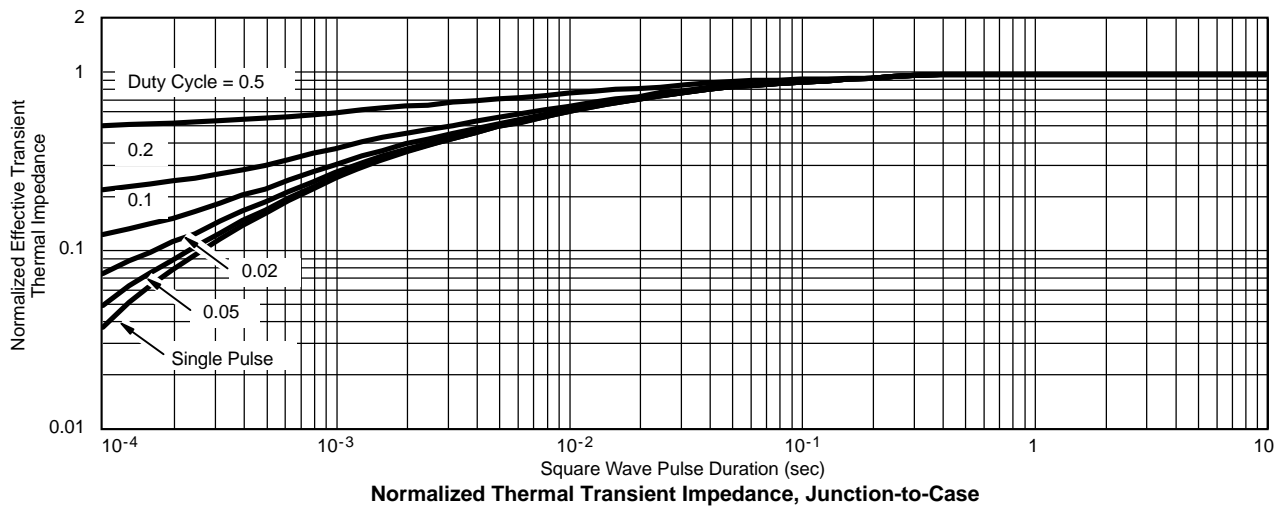
THERMAL RATINGS



Maximum Avalanche Drain Current
vs. Case Temperature



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



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