

N-Channel 180 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
180	0.042 at $V_{GS} = 10$ V	35

FEATURES

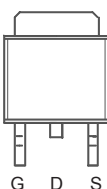
- DT-Trench Power MOSFET
- 100 % R_g and IS Tested


RoHS
 COMPLIANT

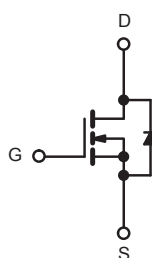
APPLICATIONS

- Primary Side Switch

TO-252



Top View



N-Channel MOSFET

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	180	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C) ^b	$T_C = 25$ °C	I_D	35	A
	$T_C = 125$ °C		19	
Pulsed Drain Current		I_{DM}	140	
Continuous Source Current (Diode Conduction)		I_S	30	
Avalanche Current		I_{AS}	30	
Single Pulse Avalanche Energy	$L = 0.1$ mH	E_{AS}	24	mJ
Maximum Power Dissipation	$T_C = 25$ °C	P_D	85 ^b	W
	$T_A = 25$ °C		6 ^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	$t \leq 10$ s	R_{thJA}	13	18	°C/W
	Steady State		27	50	
Junction-to-Case (Drain)		R_{thJC}	0.85	1.1	

Notes:

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

b. See SOA curve for voltage derating.

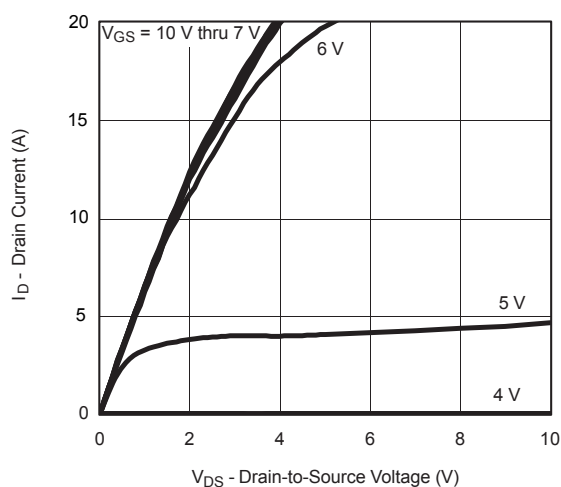
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 uA	180			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 uA	2		4	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 145 V, V _{GS} = 0 V			1	uA
		V _{DS} = 145 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 145 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	35			A
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 10 A		0.042	0.046	Ω
Forward Transconductance ^b	g _{fs}	V _{DS} = 145 V, I _D =10A		16		S
Dynamic ^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 145 V, F = 1 MHz		6750		pF
Output Capacitance	C _{oss}			1250		
Reverse Transfer Capacitance	C _{rss}			180		
Total Gate Charge ^c	Q _g	V _{DS} = 145 V, V _{GS} = 10 V, I _D =10 A		15		nC
Gate-Source Charge ^c	Q _{gs}			8		
Gate-Drain Charge ^c	Q _{gd}			12		
Gate Resistance	R _g		1.2		2.9	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 145 V, R _L = 5.2 Ω I _D ≅ 10 A, V _{GEN} = 10 V, R _g = 2.5 Ω		11	27	ns
Rise Time ^c	t _r			34	76	
Turn-Off Delay Time ^c	t _{d(off)}			22	48	
Fall Time ^c	t _f			45	90	
Source-Drain Diode Ratings and Characteristics (T _C = 25 °C)						
Continous Source-Drain Diode Current	I _S	T _C = 25 °C			30	A
Pulsed Current	I _{SM}				140	
Diode Forward Voltage ^b	V _{SD}	I _F = 19 A, V _{GS} = 0 V		0.7	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 19 A, dI/dt = 100 A/òs		160	250	ns

Notes:

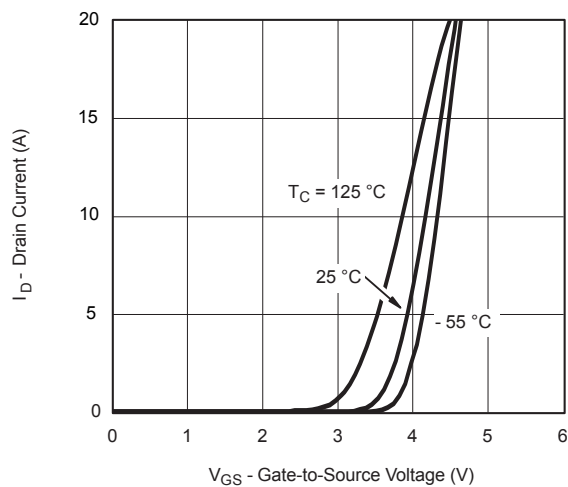
- a. Guaranteed by design, not subject to production testing.
 b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 c. Independent of operating temperature.

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.

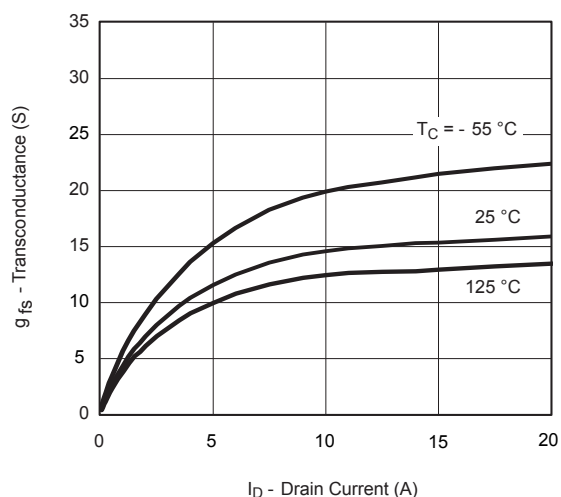
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



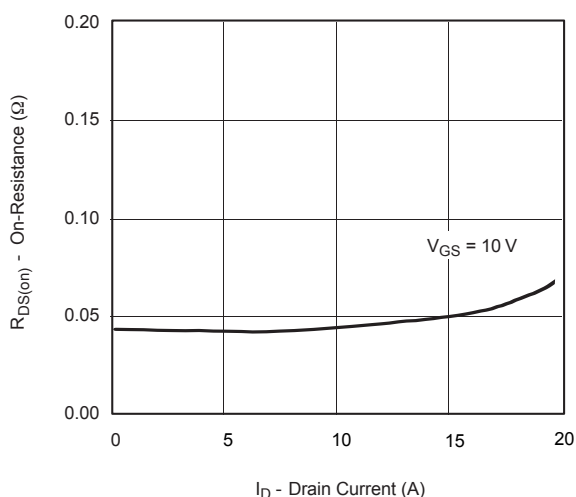
Output Characteristics



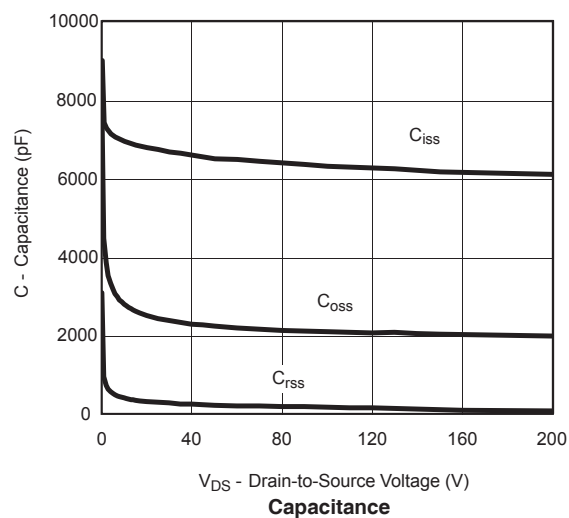
Transfer Characteristics



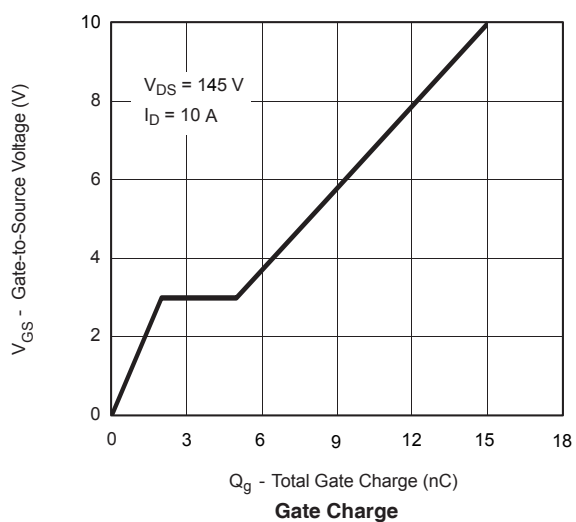
Transconductance



On-Resistance vs. Drain Current

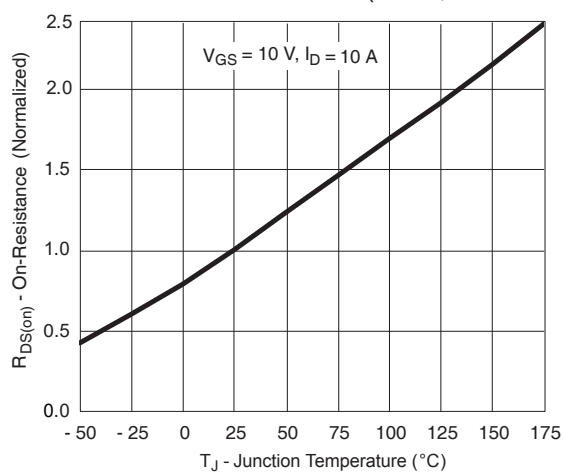


Capacitance

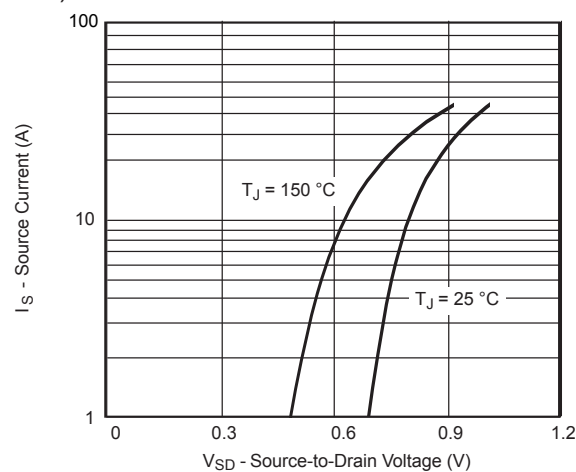


Gate Charge

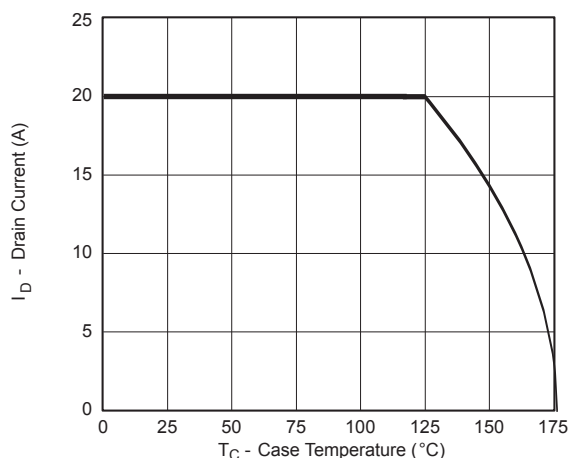
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



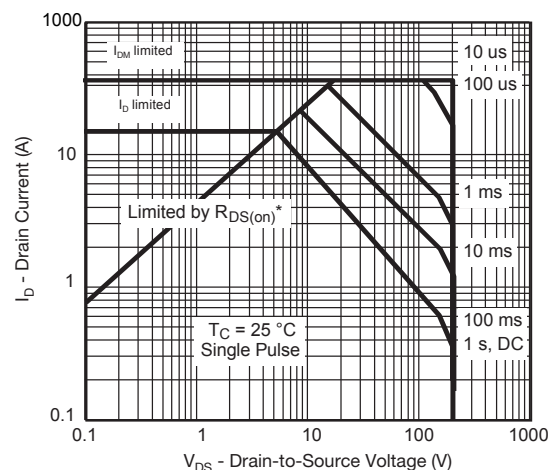
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

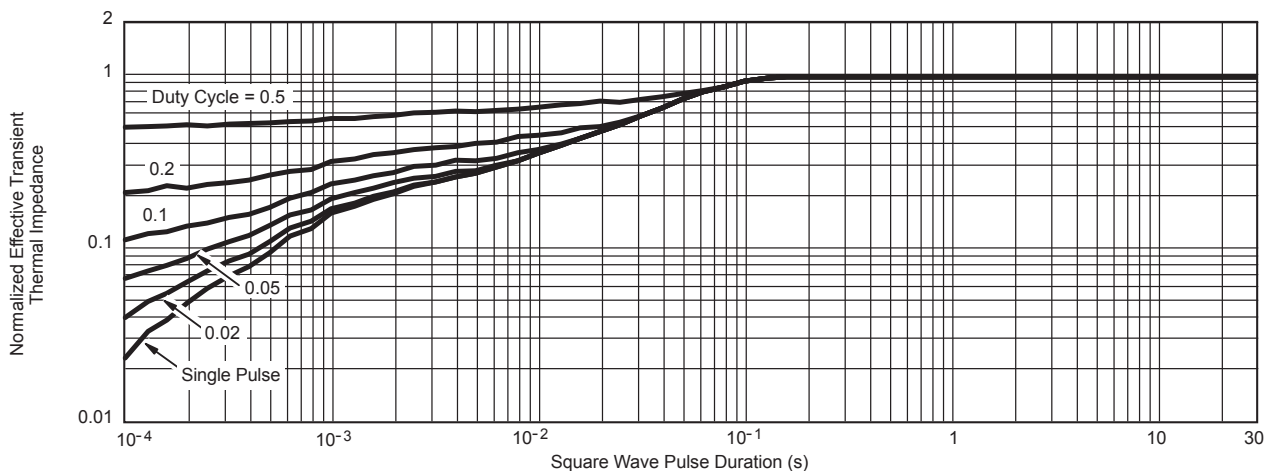


Maximum Avalanche Drain Current vs. Case Temperature



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

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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