

N-Channel 200 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
200	0.017 at $V_{GS} = 10$ V	120

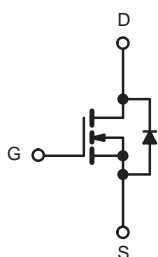
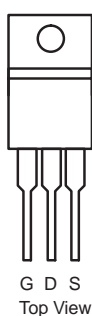
FEATURES

- DT-Trench Power MOSFET
- 175 °C Junction Temperature
- PWM Optimized
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC


RoHS
 COMPLIANT

APPLICATIONS

- Primary Side Switch

TO-220AB


N-Channel MOSFET

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C) ^b	$T_C = 25$ °C	I_D	120	A
	$T_C = 125$ °C		80	
Pulsed Drain Current		I_{DM}	320	
Continuous Source Current (Diode Conduction)		I_S	80	
Avalanche Current		I_{AS}	78	
Single Pulse Avalanche Energy	$L = 0.1$ mH	E_{AS}	116	mJ
Maximum Power Dissipation	$T_C = 25$ °C	P_D	356 ^b	W
	$T_A = 25$ °C		g ^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}		16	°C/W
	Steady State			48	
Junction-to-Case (Drain)		R_{thJC}		1.0	

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	200			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2		5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 200 V, V _{GS} = 0 V			1	μA
		V _{DS} = 200 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 200 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	100			A
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 5 A		0.017	0.022	Ω
		V _{GS} = 10 V, I _D = 5 A, T _J = 125 °C			0.040	
		V _{GS} = 10 V, I _D = 5 A, T _J = 175 °C			0.060	
		V _{GS} = 6 V, I _D = 5 A		0.030	0.102	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 19 A		76		S
Dynamic ^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, F = 1 MHz		6800		pF
Output Capacitance	C _{oss}			960		
Reverse Transfer Capacitance	C _{rss}			660		
Total Gate Charge ^c	Q _g	V _{DS} = 100 V, V _{GS} = 10 V, I _D = 19 A		94		nC
Gate-Source Charge ^c	Q _{gs}			38		
Gate-Drain Charge ^c	Q _{gd}			42		
Gate Resistance	R _g		0.5		2.9	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 100 V, R _L = 5.2 Ω I _D ≅ 19 A, V _{GEN} = 10 V, R _g = 2.5 Ω		15	25	ns
Rise Time ^c	t _r			50	75	
Turn-Off Delay Time ^c	t _{d(off)}			30	45	
Fall Time ^c	t _f			60	90	
Source-Drain Diode Ratings and Characteristics (T _C = 25 °C)						
Pulsed Current	I _{SM}				320	A
Diode Forward Voltage ^b	V _{SD}	I _F = 19 A, V _{GS} = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 19 A, dI/dt = 100 A/μs		180	250	ns

Notes:

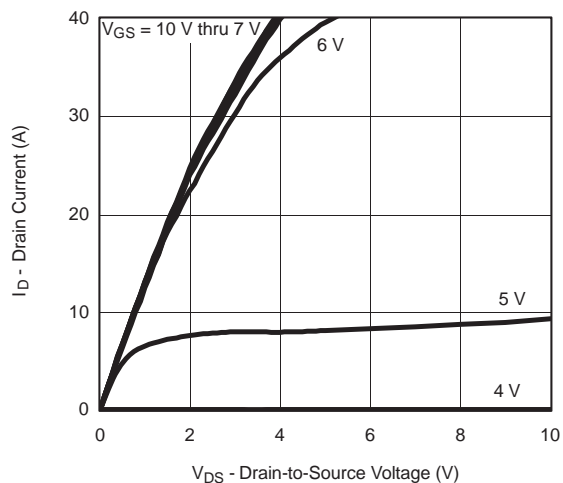
a. Guaranteed by design, not subject to production testing.

 b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

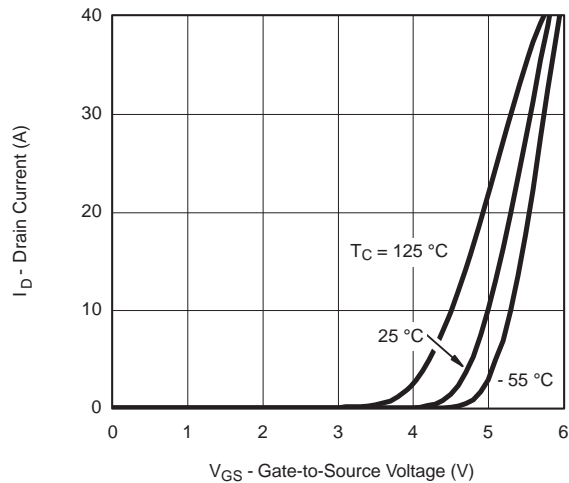
c. Independent of operating temperature.

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.

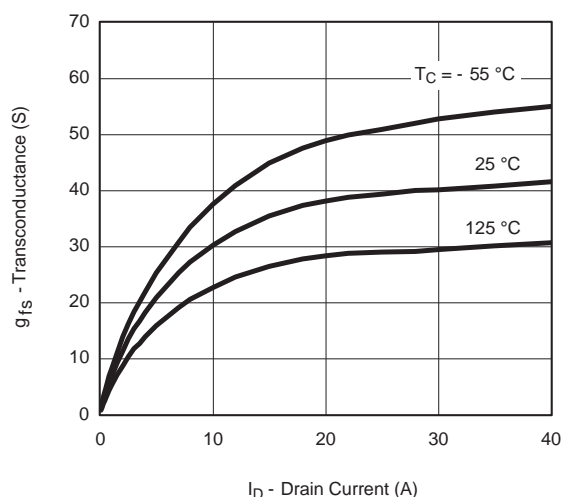
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



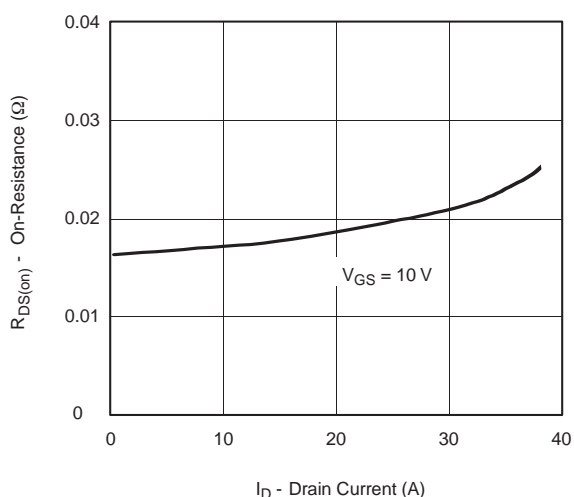
Output Characteristics



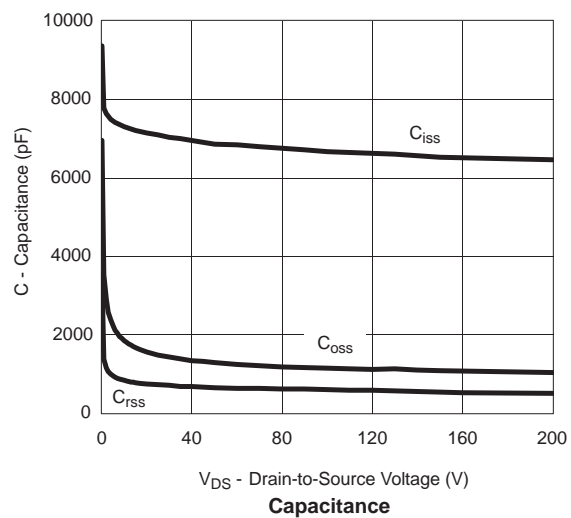
Transfer Characteristics



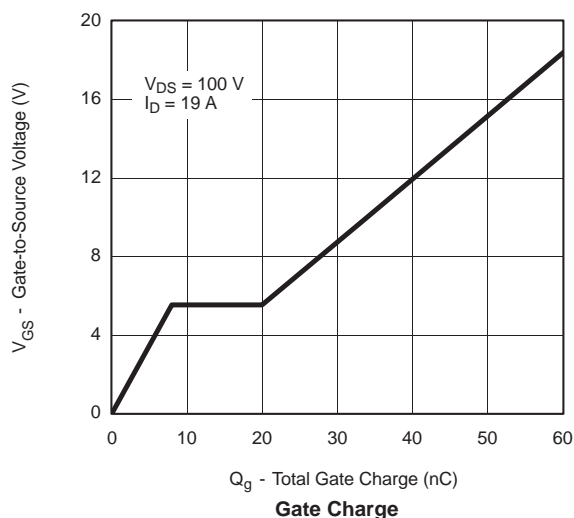
Transconductance



On-Resistance vs. Drain Current

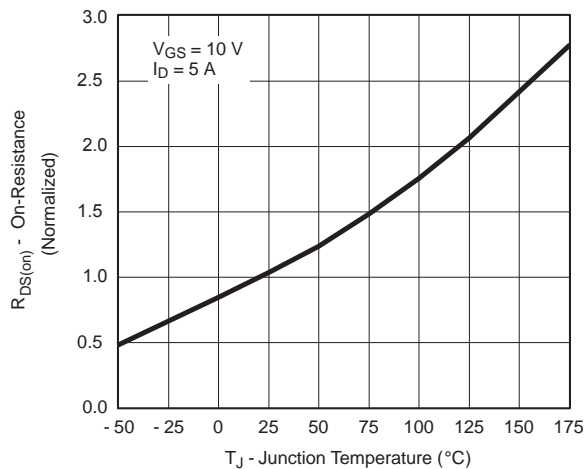


Capacitance

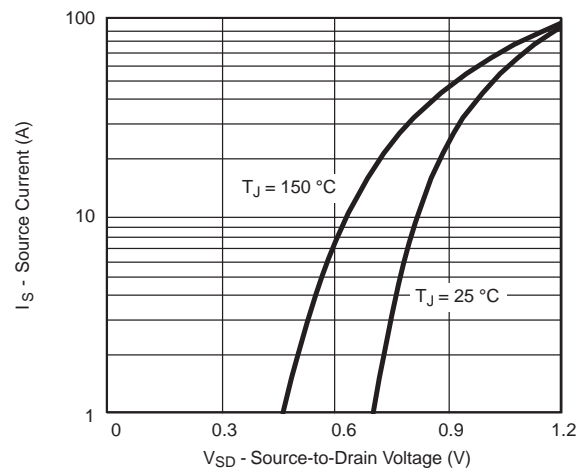


Gate Charge

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

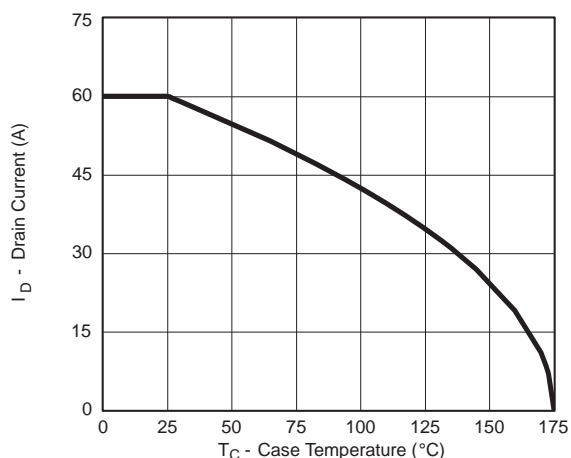


On-Resistance vs. Junction Temperature

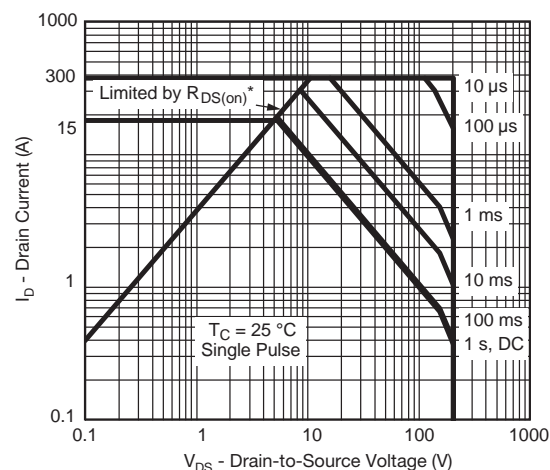


Source-Drain Diode Forward Voltage

THERMAL RATINGS

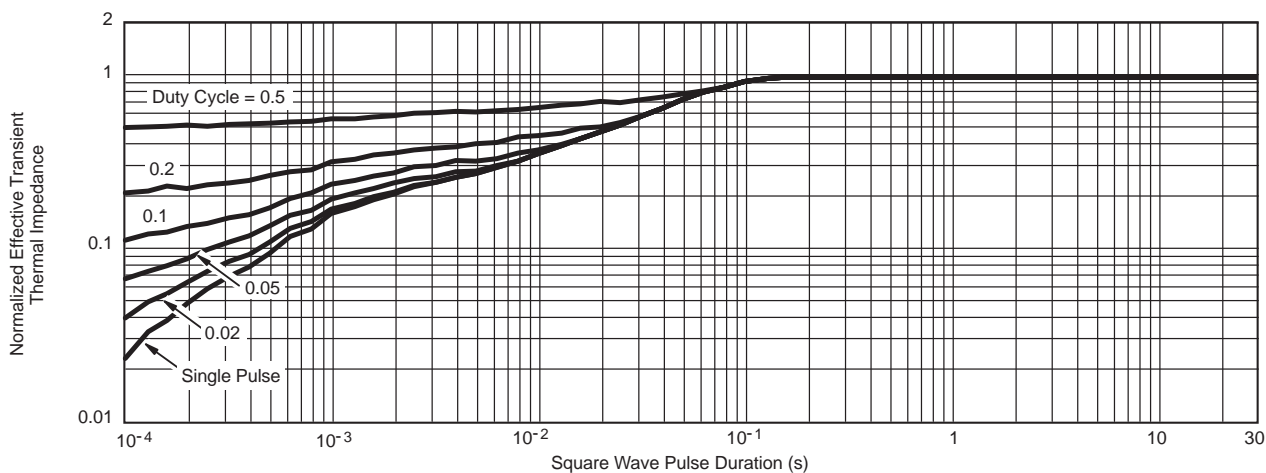


Maximum Avalanche Drain Current vs. Case Temperature



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

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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