

P-Channel 200 V (D-S) Power MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)(Max.)	I_D (A) ^a	Q_g (Max.)
-200	0.5 at $V_{GS} = -10$ V	-10	32 nC

FEATURES

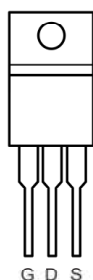
- DT-Trench Power MOSFET
- 100 % UIS Tested
- Fast switching

APPLICATIONS

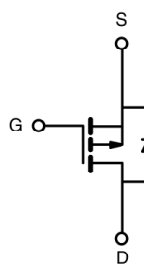
- Load Switch


 RoHS
 COMPLIANT

TO-220AB



Top View



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	-200	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ^d ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$ -10	A
		$T_C = 100^\circ\text{C}$ -6.6	
Pulsed Drain Current	I_{DM}	-40	
Avalanche Current	I_{AS}	-38	mJ
Single Pulse Avalanche Energy ^a	E_{AS}	713	
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$ ^c 128	W
		$T_A = 25^\circ\text{C}$ ^b 4.86	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	MAX.	UNIT
Junction-to-Ambient	R_{thJA}	62	$^\circ\text{C}/\text{W}$
Junction-to-Case	R_{thJC}	1.0	

Notes

- Duty cycle $\leq 1\%$.
- When mounted on 1" square PCB (FR4 material).
- See SOA curve for voltage derating.

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	- 200			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T	I _D = - 250 μA		-193		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			- 5.2		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 2		- 4	V
Gate-Source 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			- 100	μA
		V _{DS} = - 160 V, V _{GS} = 0 V, T _J = 125 °C			- 500	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 6 A			0.5	Ω
Forward Transconductance ^a	g _{fs}	V _{DS} = - 50 V, I _D = - 6 A	4.5			S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = - 25 V, V _{GS} = 0 V, f = 1 MHz		1230		pF
Output Capacitance	C _{oss}			390		
Reverse Transfer Capacitance	C _{rss}			85		
Total Gate Charge	Q _g	V _{DS} = - 160 V, V _{GS} = - 10 V, I _D = - 6 A		32	45	nC
Gate-Source Charge	Q _{gs}			6		
Gate-Drain Charge	Q _{gd}			23		
Gate Resistance	R _g	f = 1 MHz		1.2		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 100 V, R _L = 10 Ω I _D = - 6 A, V _{GEN} = - 10 V, R _g = 9 Ω		15		ns
Rise Time	t _r			45		
Turn-Off Delay Time	t _{d(off)}			40		
Fall Time	t _f			36		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			- 10	A
Pulse Diode Forward Current ^a	I _{SM}				- 40	
Body Diode Voltage	V _{SD}	I _S = - 6 A			- 5	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 10 A, di/dt = 100 A/μs, T _J = 25 °C		205	330	ns
Body Diode Reverse Recovery Charge	Q _{rr}			3	4	μC
Reverse Recovery Fall Time	t _a			109		ns
Reverse Recovery Rise Time	t _b			116		

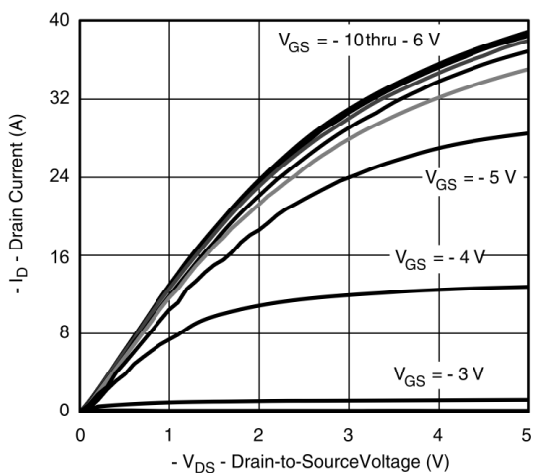
Notes:

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

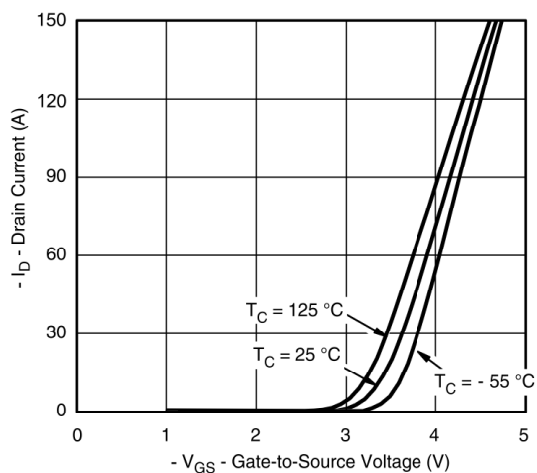
b. Guaranteed by design, not subject to production testing.

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.

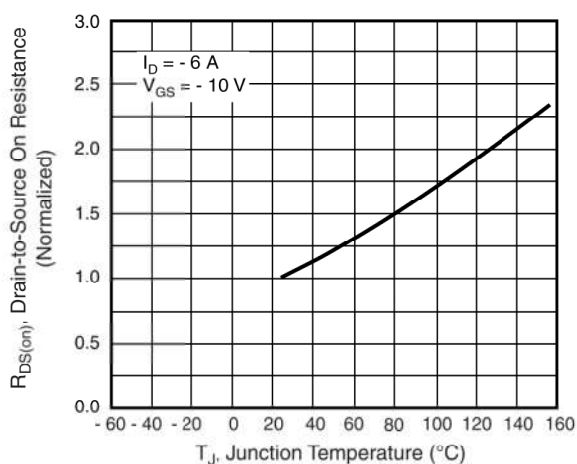
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



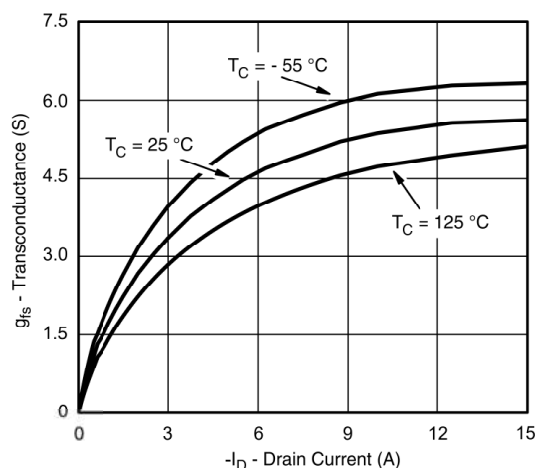
Output Characteristics



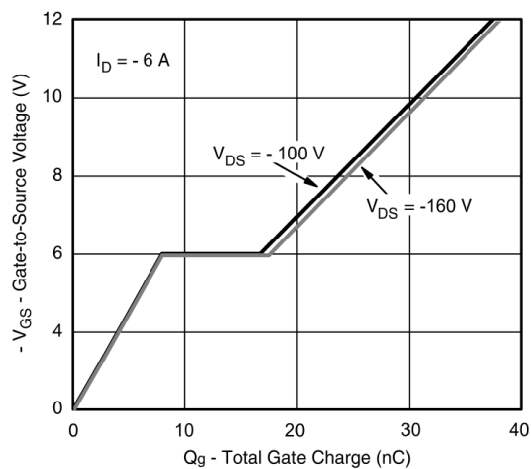
Transfer Characteristics



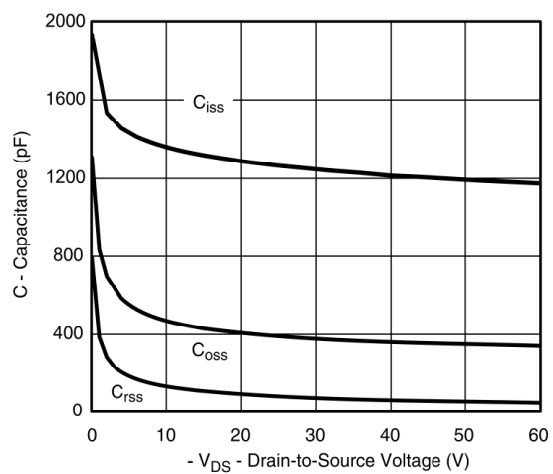
Normalized On-Resistance vs. Temperature



Transconductance

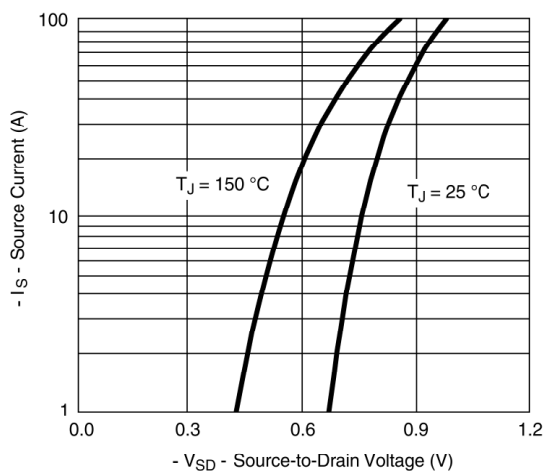


Gate Charge

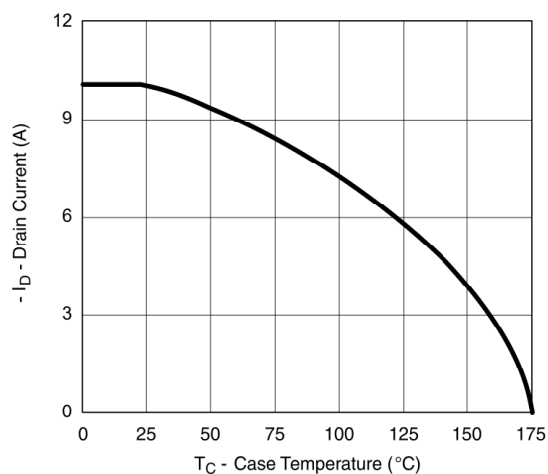


Capacitance

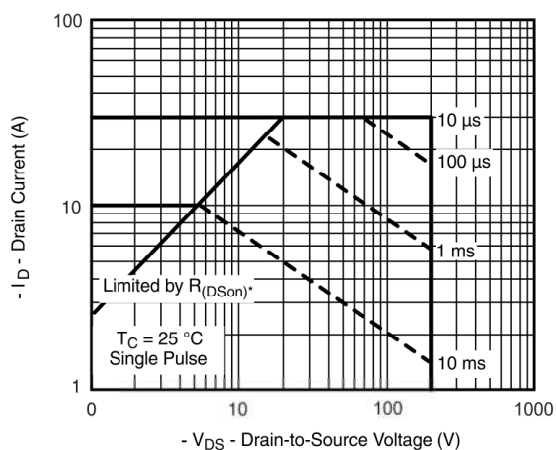
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Source-Drain Diode Forward Voltage

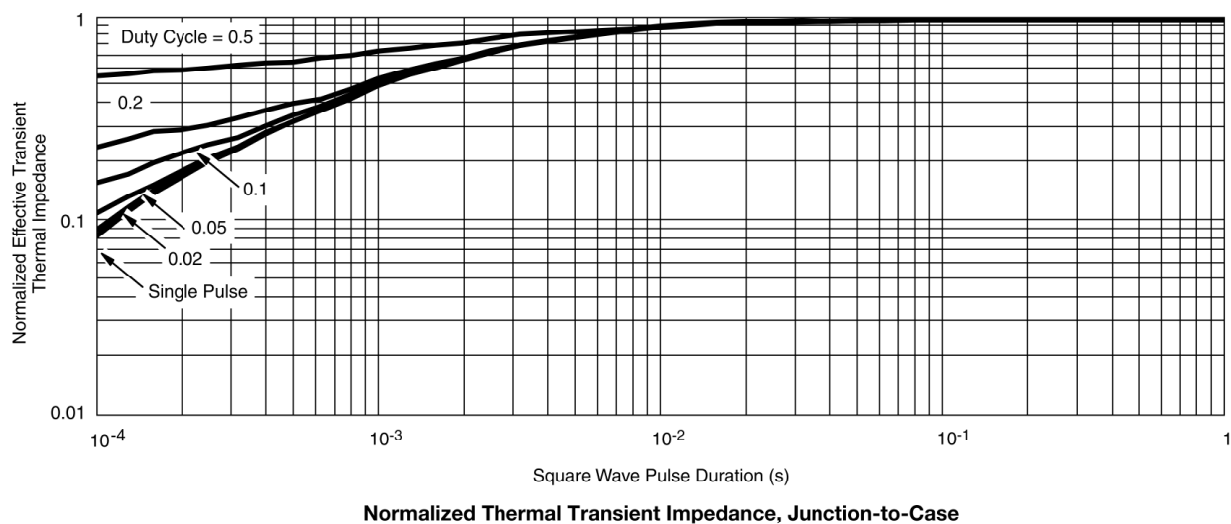


Maximum Avalanche and Drain Current vs. Case Temperature



Maximum Safe Operating Area

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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