

N-Channel Enhancement Mode Power MOSFET

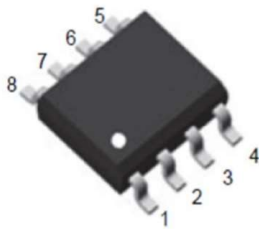
Features

- $V_{DS} = 200V$, $I_D = 3A$
 $R_{DS(ON)} < 260\text{ m}\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)} < 310\text{ m}\Omega$ @ $V_{GS} = 4.5V$

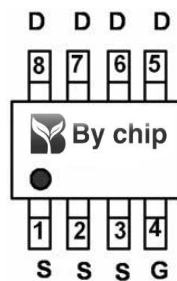
General Features

- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free and Green Available

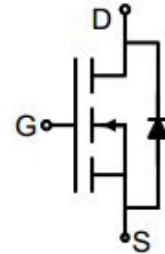
100% UIS TESTED!
100% ΔV_{ds} TESTED!



SOP-8



pin assignment



Schematic diagram

ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175\text{ }^\circ\text{C}$) ^b	$T_C = 25\text{ }^\circ\text{C}$	I_D	3	A
	$T_C = 125\text{ }^\circ\text{C}$		2.7	
Pulsed Drain Current		I_{DM}	10	
Continuous Source Current (Diode Conduction)		I_S	6	
Avalanche Current		I_{AS}	6	
Single Pulse Avalanche Energy	$L = 0.1\text{ mH}$	E_{AS}	18	mJ
Maximum Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	P_D	96 ^b	W
	$T_A = 25\text{ }^\circ\text{C}$		3 ^a	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^a	$t \leq 10\text{ s}$	R_{thJA}	15	18	$^\circ\text{C/W}$
	Steady State		40	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 μA	200			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	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} = 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	40			A
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 3 A		0.260		Ω
		V _{GS} = 10 V, I _D = 3 A, T _J = 125 °C		0.310		
		V _{GS} = 10 V, I _D = 3 A, T _J = 175 °C		0.330		
		V _{GS} = 6 V, I _D = 3 A		0.292		
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 3 A		35		S
Dynamic ^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, F = 1 MHz		1800		pF
Output Capacitance	C _{oss}			180		
Reverse Transfer Capacitance	C _{rss}			80		
Total Gate Charge ^c	Q _g	V _{DS} = 100 V, V _{GS} = 10 V, I _D = 3 A		34	51	nC
Gate-Source Charge ^c	Q _{gs}			8		
Gate-Drain Charge ^c	Q _{gd}			12		
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 ≅ 3 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}				5	A
Diode Forward Voltage ^b	V _{SD}	I _F = 3 A, V _{GS} = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 3 A, dI/dt = 100 A/μs		180	250	ns

Notes:

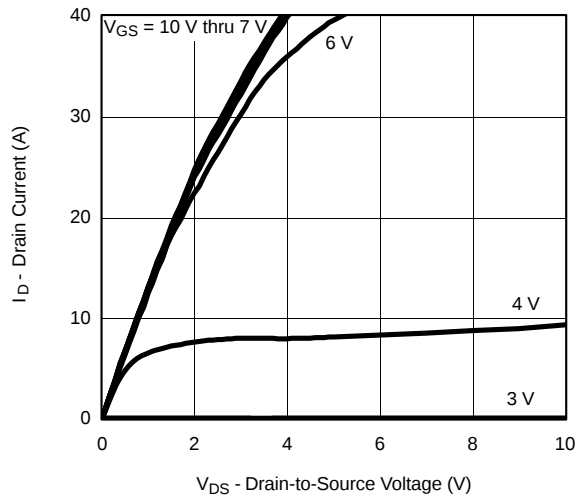
a. Guaranteed by design, not subject to production testing.

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

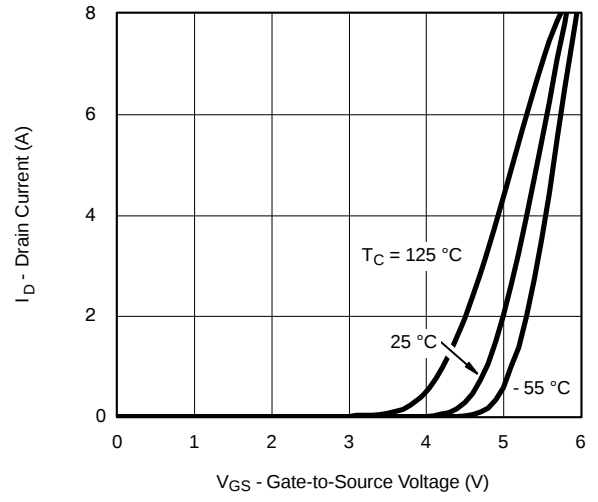
c. Independent of operating temperature.

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.

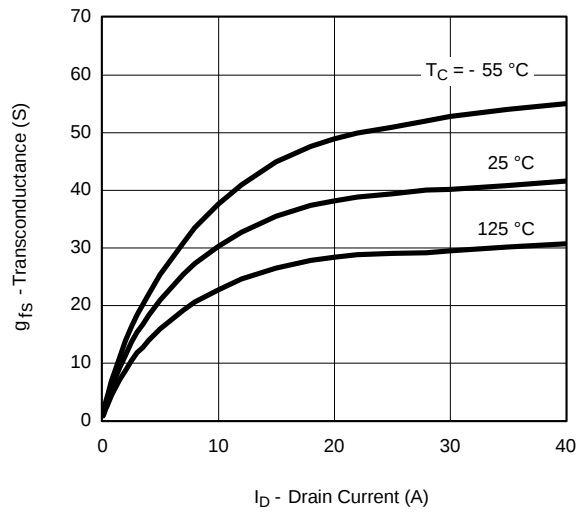
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



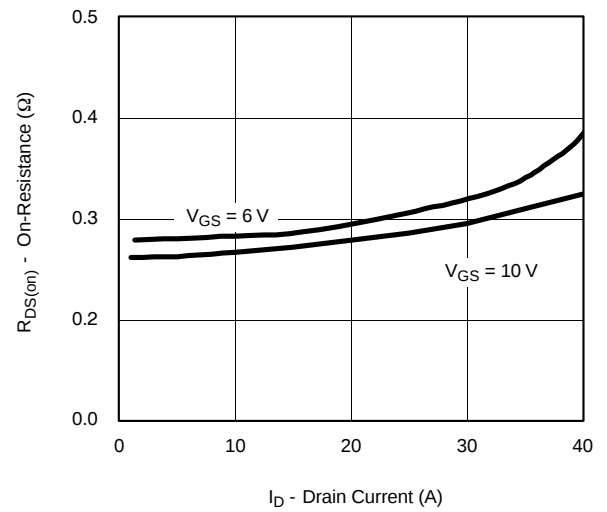
Output Characteristics



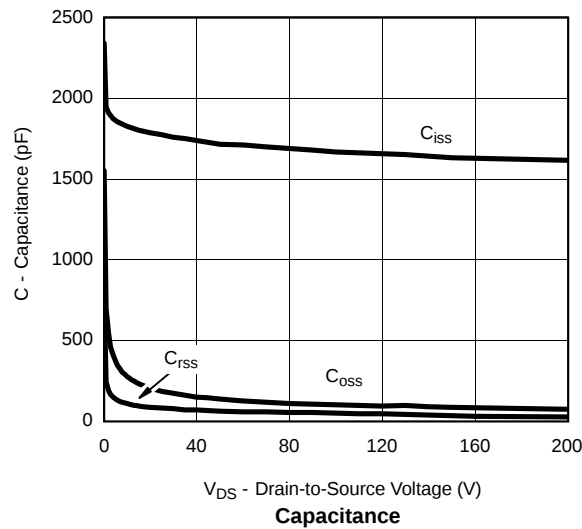
Transfer Characteristics



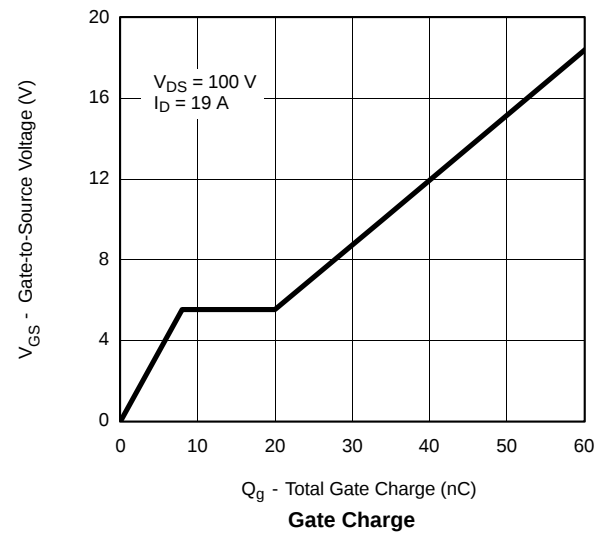
Transconductance



On-Resistance vs. Drain Current

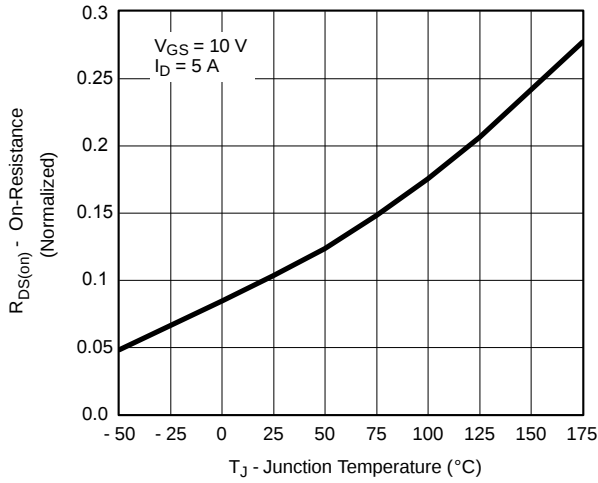


Capacitance

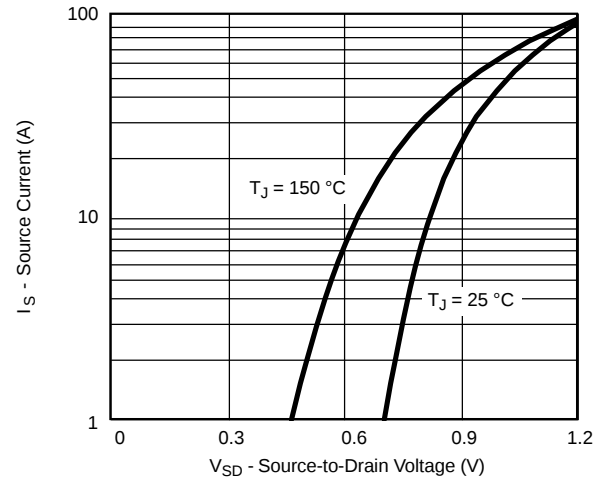


Gate Charge

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

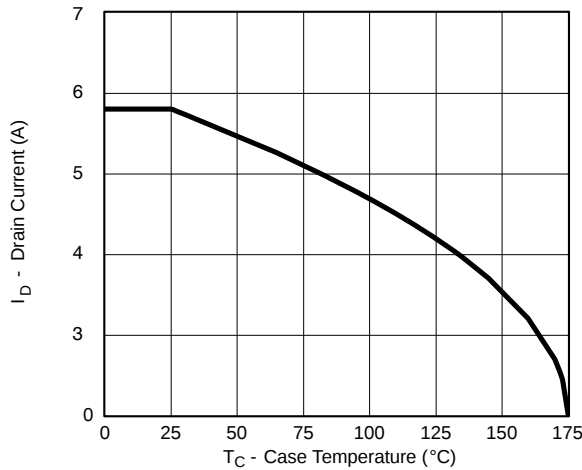


On-Resistance vs. Junction Temperature

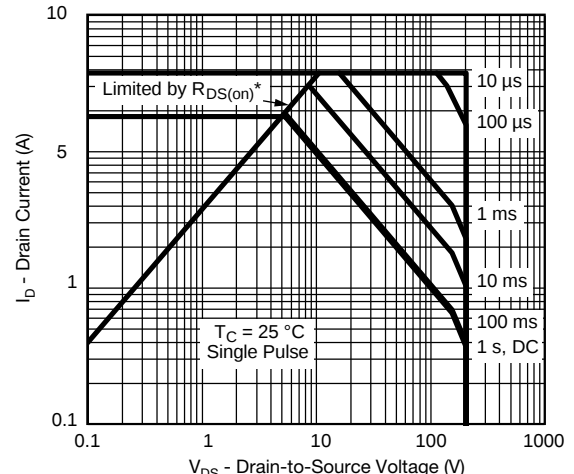


Source-Drain Diode Forward Voltage

THERMAL RATINGS

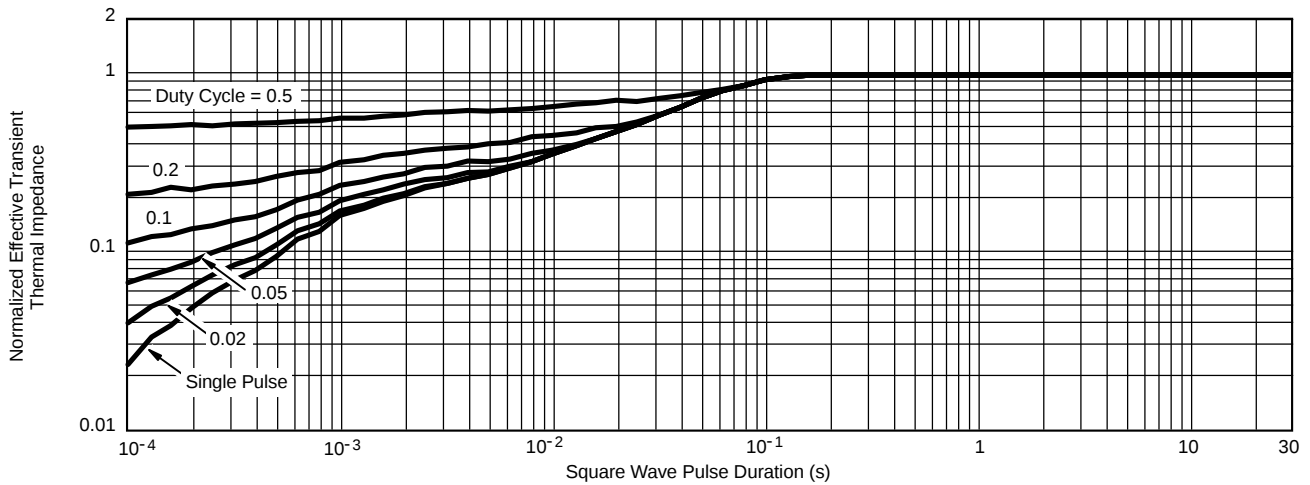


Maximum Avalanche Drain Current vs. Case Temperature



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

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case