

N-channel Enhancement Mode Power MOSFET

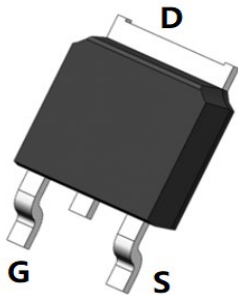
Features

- $V_{DS} = 60V$, $I_D = 50A$
- $R_{DS(ON)} < 73m\Omega$ @ $V_{GS} = 10V$
- $R_{DS(ON)} < 85 m\Omega$ @ $V_{GS} = 4.5V$

General Features

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

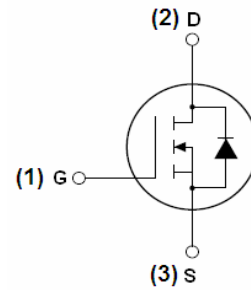
100% UIS TESTED!
100% ΔV_{ds} TESTED!



TO-252-2L Top View



Pin Assignment



Schematic Diagram

ABSOLUTE MAXIMUM RATINGS ($T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	I_D	18	A
	$T_C = 70\text{ }^\circ\text{C}$		14	
Pulsed Drain Current ($t = 300\text{ }\mu\text{s}$)		I_{DM}	25	
Avalanche Current		I_{AS}	15	
Single Avalanche Energy ^a	$L = 0.1\text{ mH}$	E_{AS}	11.25	mJ
Maximum Power Dissipation ^a	$T_C = 25\text{ }^\circ\text{C}$	P_D	41.7 ^b	W
	$T_A = 25\text{ }^\circ\text{C}$		2.1	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	$^\circ\text{C}$
THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Limit	Unit
Junction-to-Ambient (PCB Mount) ^c		R_{thJA}	60	$^\circ\text{C}/\text{W}$
Junction-to-Case (Drain)		R_{thJC}	3	

SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1.0		3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 250	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			50	
		$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}, T_J = 150\text{ }^\circ\text{C}$			250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 6.6\text{ A}$		0.073		Ω
		$V_{GS} = 4.5\text{ V}, I_D = 6\text{ A}$		0.085		
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 6.6\text{ A}$		25		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		660		μF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			40		
Total Gate Charge ^c	Q_g	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 6.6\text{ A}$		19.8	30	nC
Gate-Source Charge ^c	Q_{gs}			3.6		
Gate-Drain Charge ^c	Q_{gd}			4.1		
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.4	2	4	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}, R_L = 9.6\text{ }\Omega$ $I_D \cong 5.2\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$		8	16	ns
Rise Time ^c	t_r			11	20	
Turn-Off Delay Time ^c	$t_{d(off)}$			18	27	
Fall Time ^c	t_f			5	10	
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}, R_L = 9.6\text{ }\Omega$ $I_D \cong 5.2\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 1\text{ }\Omega$		38	57	
Rise Time ^c	t_r			58	87	
Turn-Off Delay Time ^c	$t_{d(off)}$			18	27	
Fall Time ^c	t_f			8	16	
Drain-Source Body Diode Ratings and Characteristics^b $T_C = 25\text{ }^\circ\text{C}$						
Continuous Current	I_S				18	A
Pulsed Current	I_{SM}				25	
Forward Voltage ^a	V_{SD}	$I_F = 5.2\text{ A}, V_{GS} = 0\text{ V}$		0.8	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 5.2\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		34	51	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			3	5	A
Reverse Recovery Charge	Q_{rr}				50	75

Notes:

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



On-Resistance vs. Drain Current



Transfer Characteristics



On-Resistance vs. Gate-to-Source Voltage



Transconductance

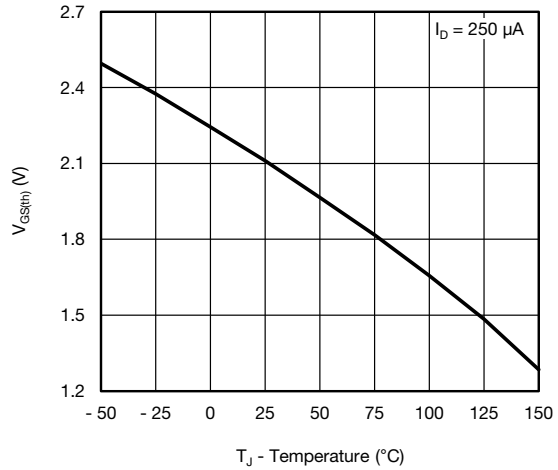


Gate Charge

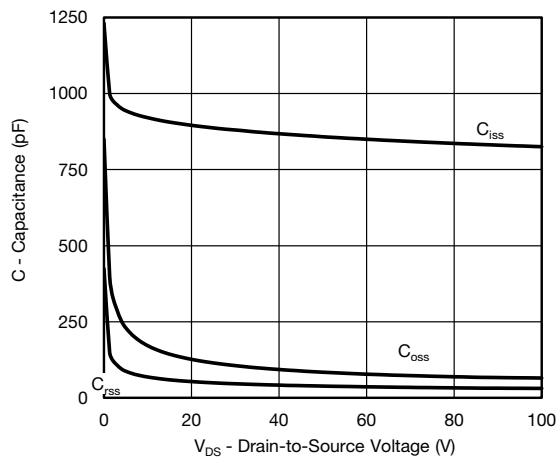
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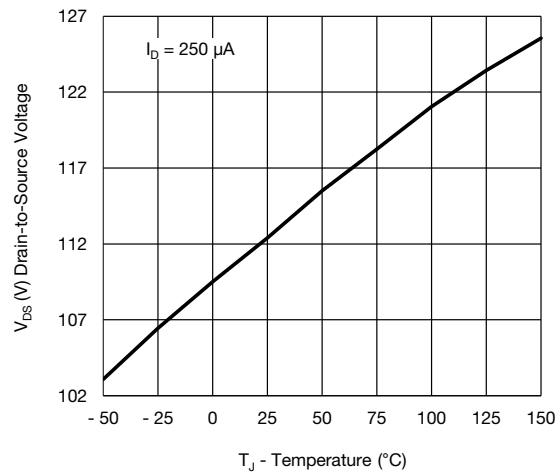
Source-Drain Diode Forward Voltage



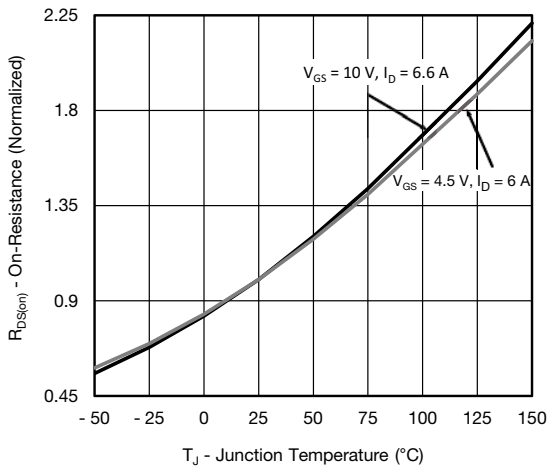
Threshold Voltage



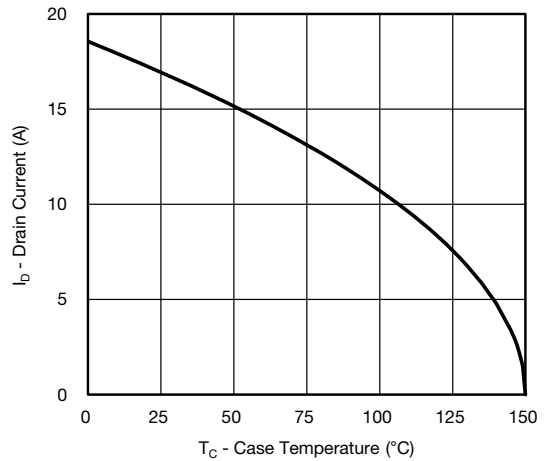
Capacitance



Drain Source Breakdown vs. Junction Temperature

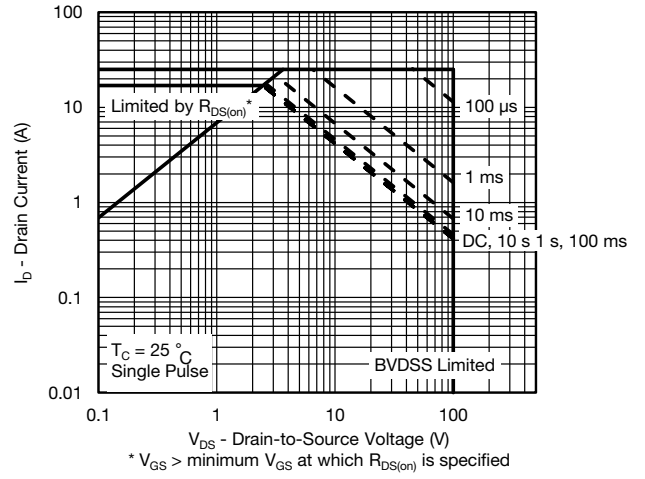
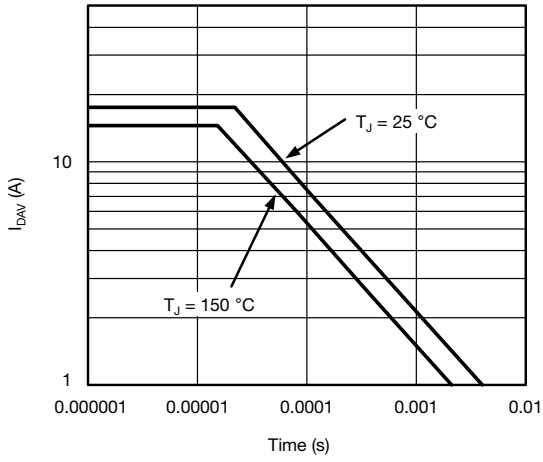


On-Resistance vs. Junction Temperature



Current Derating

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Single Pulse Avalanche Current Capability vs. Time

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case