

N&P-Channel complementary Power MOSFET

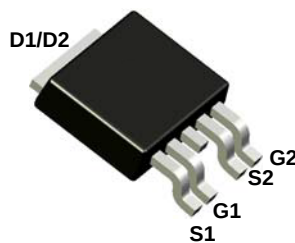
Features

- N-Channel: 60V, 35A
 $R_{DS(ON)} < 30m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 33m\Omega @ V_{GS} = 4.5V$
- P-Channel: -60V, -19A
 $R_{DS(ON)} < 50m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 60m\Omega @ V_{GS} = -4.5V$

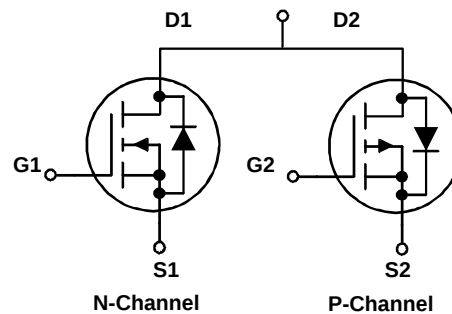
General Features

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

100% UIS TESTED!
100% ΔV_{ds} TESTED!



Dual TO-252-4L



ABSOLUTE MAXIMUM RATINGS (TA = 25°C UNLESS OTHERWISE NOTED)					
Parameter	Symbol	Nch Limit	Pch Limit	Units	
Drain-Source Voltage	V_{DS}	60	-60	V	
Gate-Source Voltage	V_{GS}	± 20	± 20		
Continuous Drain Current ^a	I_D	35	-20	A	
Pulsed Drain Current ^b	I_{DM}	140	-80		
Continuous Source Current (Diode Conduction) ^a	I_S	35	-20	A	
Power Dissipation ^a	P_D	50	50	W	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	T_J, T_{stg}	-55 to 175	°C	

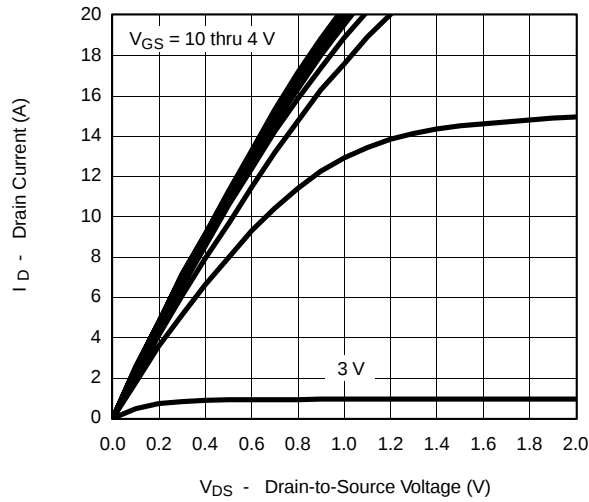
THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient ^c	$R_{\theta JA}$	50	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	3	

Notes

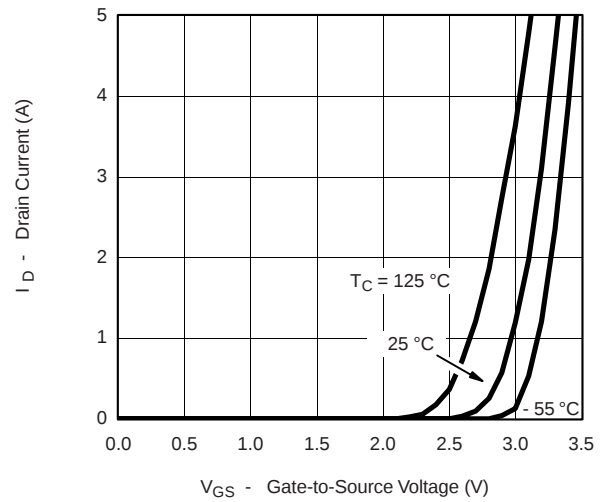
- Package Limited
- Pulse width limited by maximum junction temperature
- Surface Mounted on 1" x 1" FR4 Board.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \text{ uA}$	1		3	V
		$V_{DS} = V_{GS}, I_D = -250 \text{ uA}$	-1		-3	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60 \text{ V}, V_{GS} = 0 \text{ V}$			1	uA
		$V_{DS} = -48 \text{ V}, V_{GS} = 0 \text{ V}$			-1	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$	45			A
		$V_{DS} = -5 \text{ V}, V_{GS} = -10 \text{ V}$	-25			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 20 \text{ A}$		30		mΩ
		$V_{GS} = 4.5 \text{ V}, I_D = 16 \text{ A}$		33		
		$V_{GS} = -10 \text{ V}, I_D = -10 \text{ A}$		50		mΩ
		$V_{GS} = -4.5 \text{ V}, I_D = -8 \text{ A}$		60		
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 \text{ V}, I_D = 20 \text{ A}$		15		S
		$V_{DS} = -15 \text{ V}, I_D = -10 \text{ A}$		11		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 17 \text{ A}, V_{GS} = 0 \text{ V}$		0.89		V
		$I_S = -10 \text{ A}, V_{GS} = 0 \text{ V}$		-0.98		V
Dynamic ^b						
Total Gate Charge	Q_g	N - Channel $V_{DS} = 30 \text{ V}, V_{GS} = 4.5 \text{ V},$ $I_D = 20 \text{ A}$		9		nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			4		
Turn-On Delay Time	$t_{d(on)}$	N - Channel $V_{DS} = 30 \text{ V}, R_L = 1.5 \text{ } \Omega,$ $I_D = 20 \text{ A},$ $V_{GEN} = 10 \text{ V}, R_{GEN} = 6 \text{ } \Omega$		5		ns
Rise Time	t_r			5		
Turn-Off Delay Time	$t_{d(off)}$			27		
Fall Time	t_f			8		
Input Capacitance	C_{iss}	N - Channel $V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ Mhz}$		1500		pF
Output Capacitance	C_{oss}			84		
Reverse Transfer Capacitance	C_{rss}			79		
Total Gate Charge	Q_g	P - Channel $V_{DS} = -30 \text{ V}, V_{GS} = 4.5 \text{ V},$ $I_D = -10 \text{ A}$		10		nC
Gate-Source Charge	Q_{gs}			5		
Gate-Drain Charge	Q_{gd}			4		
Turn-On Delay Time	$t_{d(on)}$	P - Channel $V_{DS} = -30 \text{ V}, R_L = 3 \text{ } \Omega,$ $I_D = -10 \text{ A},$ $V_{GEN} = -10 \text{ V}, R_{GEN} = 6 \text{ } \Omega$		5		ns
Rise Time	t_r			4		
Turn-Off Delay Time	$t_{d(off)}$			30		
Fall Time	t_f			11		
Input Capacitance	C_{iss}	P - Channel $V_{DS} = -15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ Mhz}$		1180		pF
Output Capacitance	C_{oss}			84		
Reverse Transfer Capacitance	C_{rss}			60		

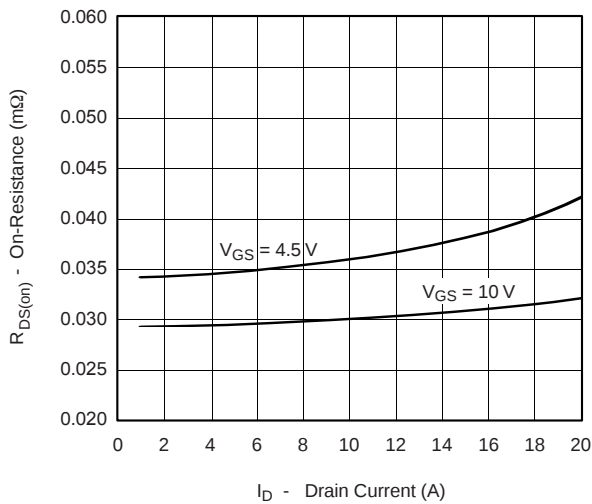
N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



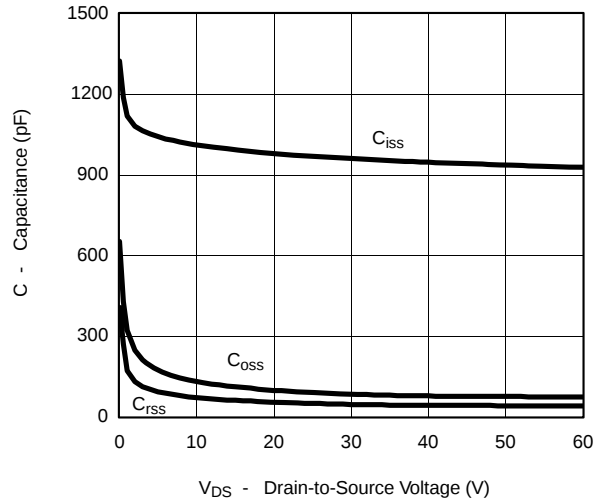
Output Characteristics



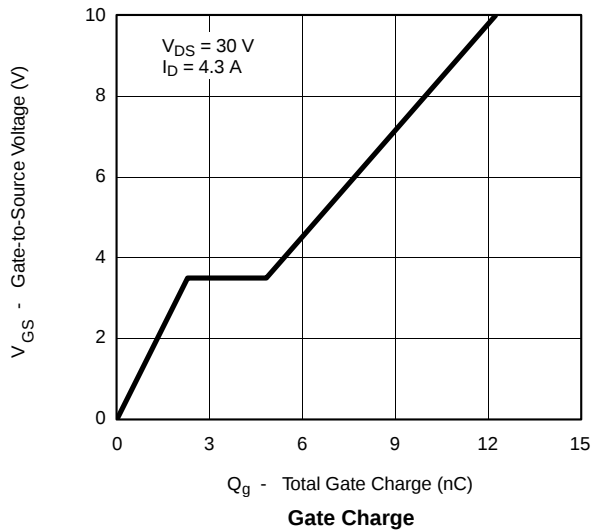
Transfer Characteristics



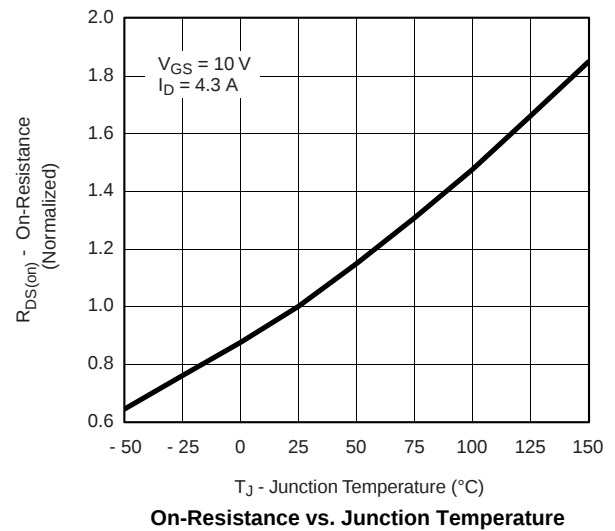
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

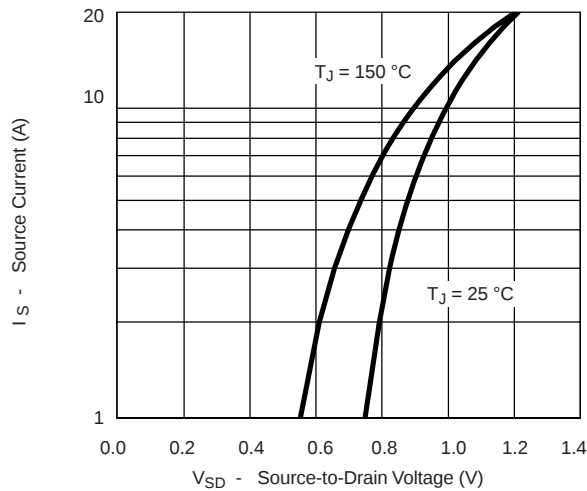


Gate Charge

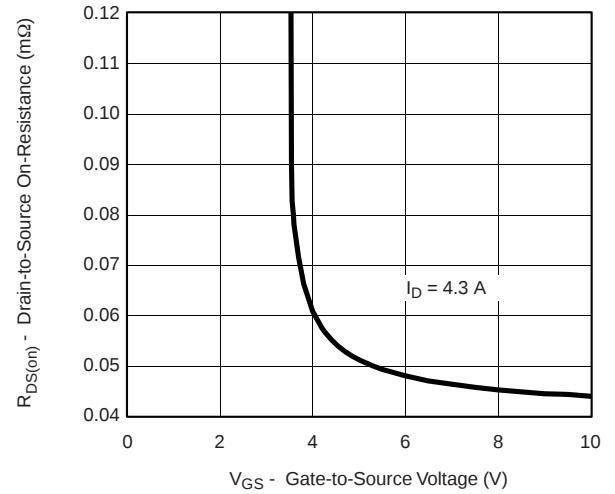


On-Resistance vs. Junction Temperature

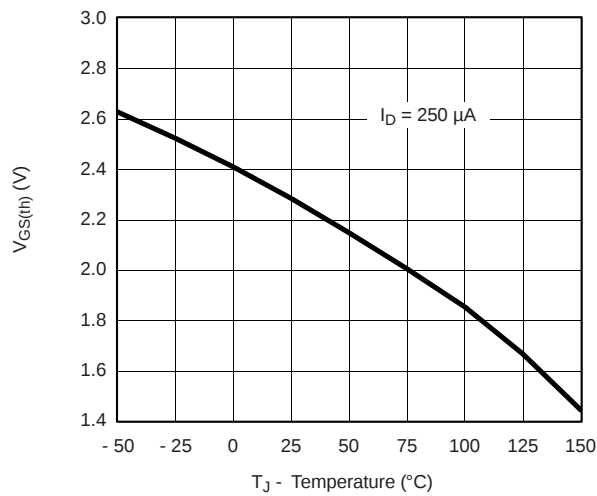
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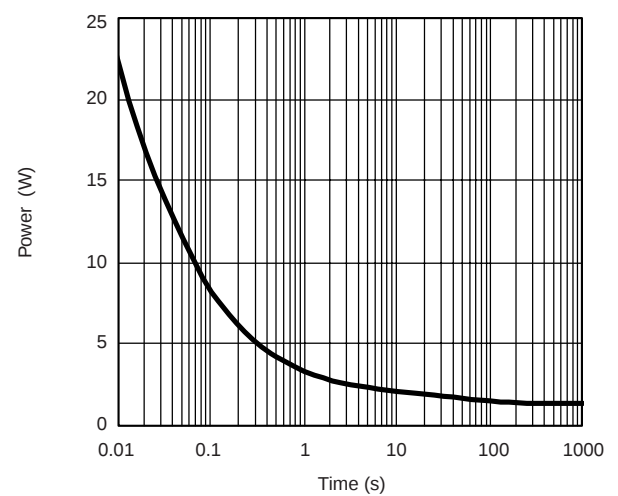
Source-Drain Diode Forward Voltage



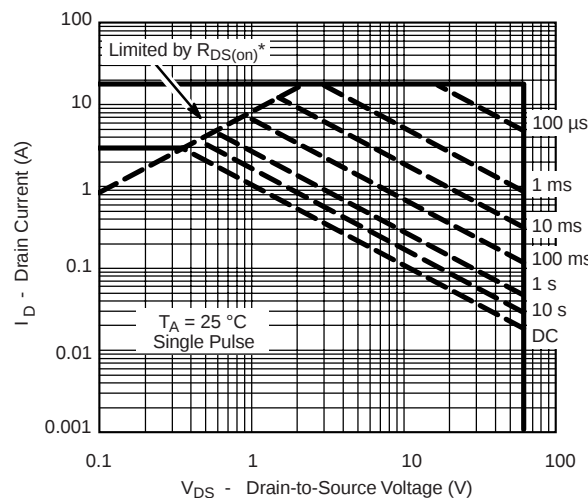
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

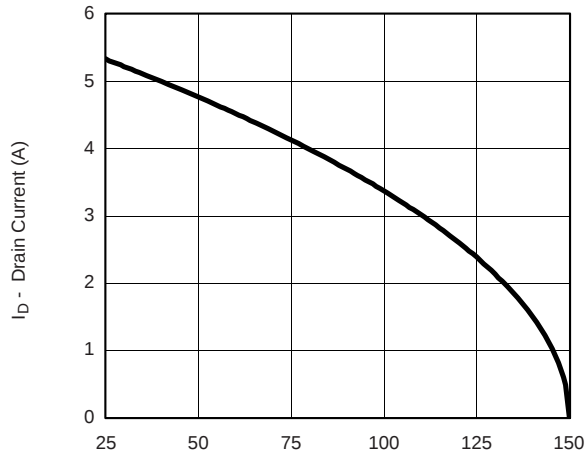
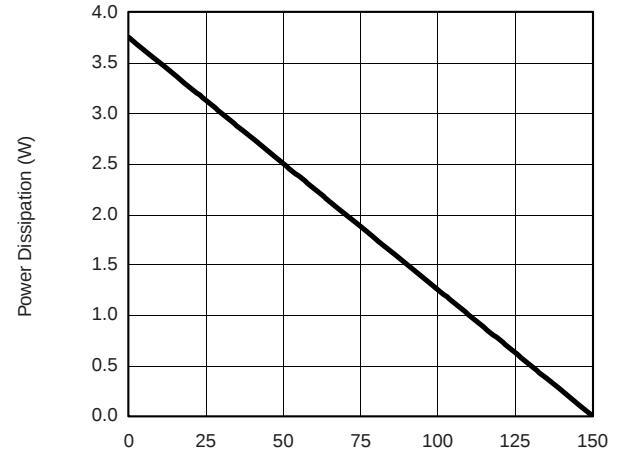
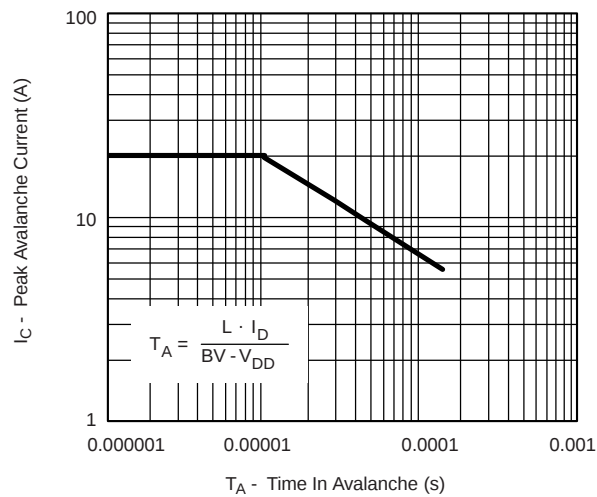


Single Pulse Power, Junction-to-Ambient



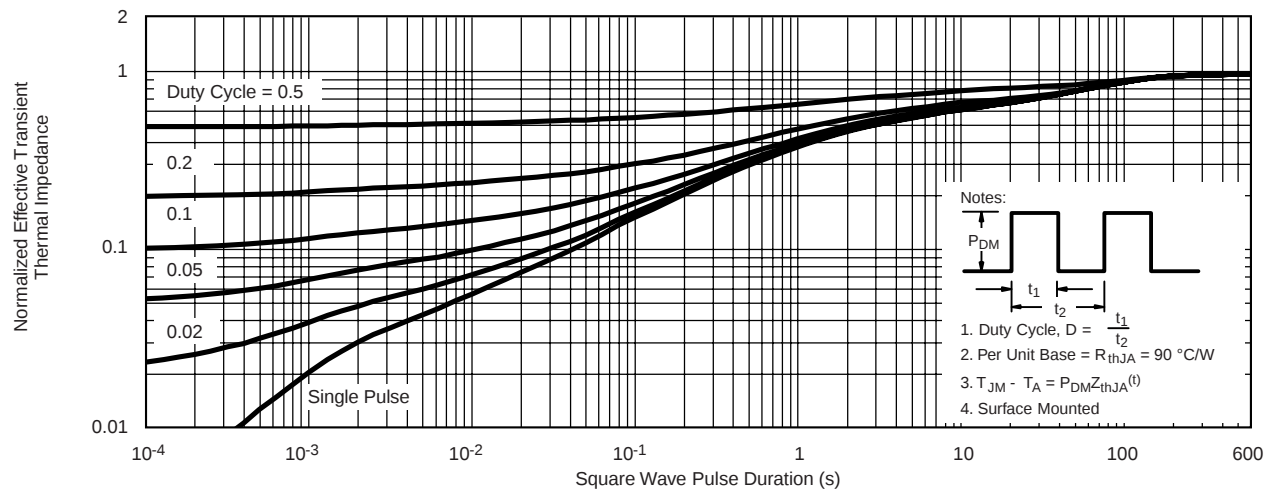
* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area

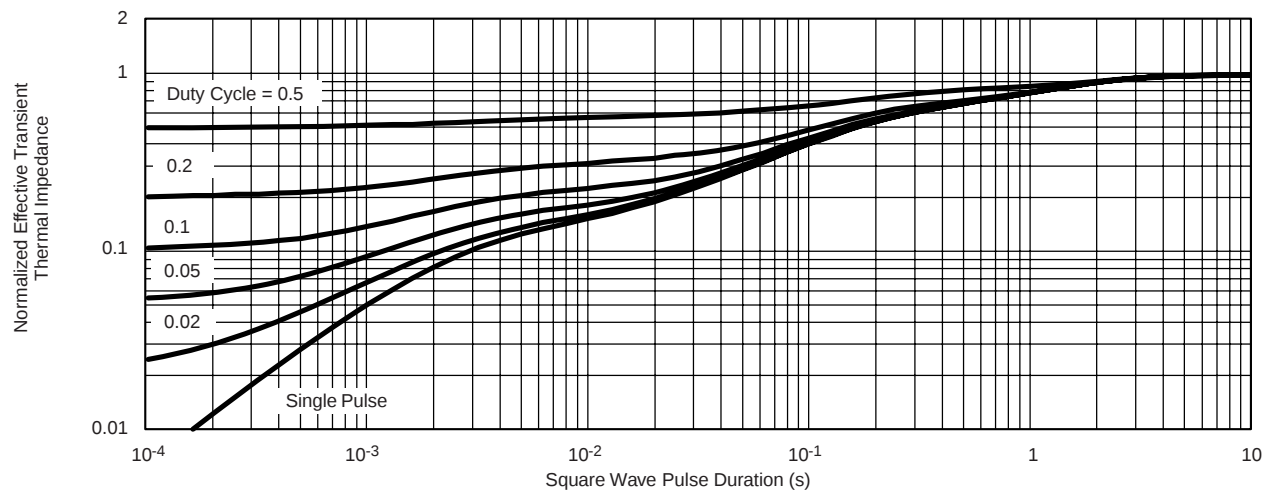
N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted T_C - Case Temperature (°C)**Current Derating*** T_C - Case Temperature (°C)**Power Derating** T_A - Time In Avalanche (s)**Single Pulse Avalanche Capability**

* The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

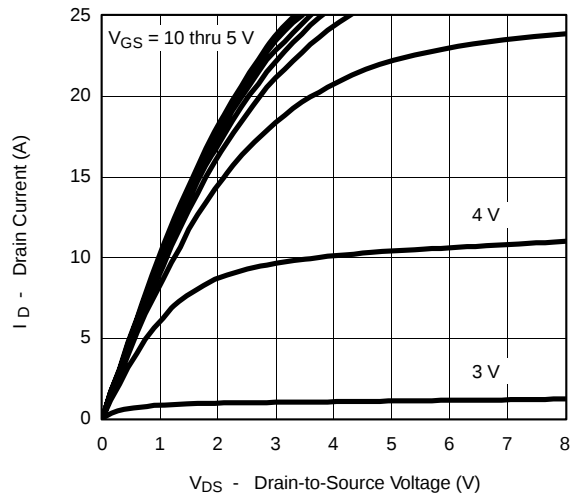


Normalized Thermal Transient Impedance, Junction-to-Ambient

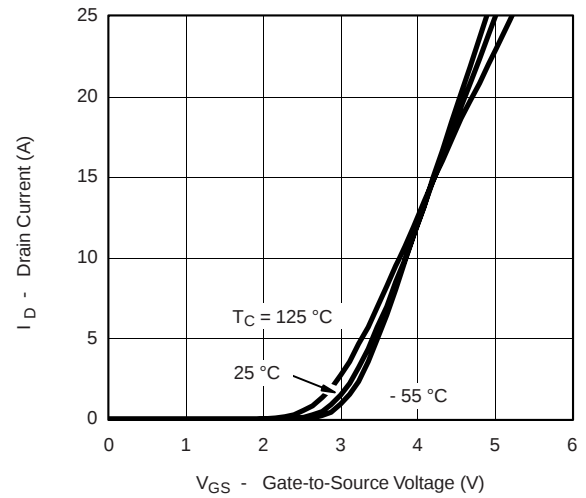


Normalized Thermal Transient Impedance, Junction-to-Case

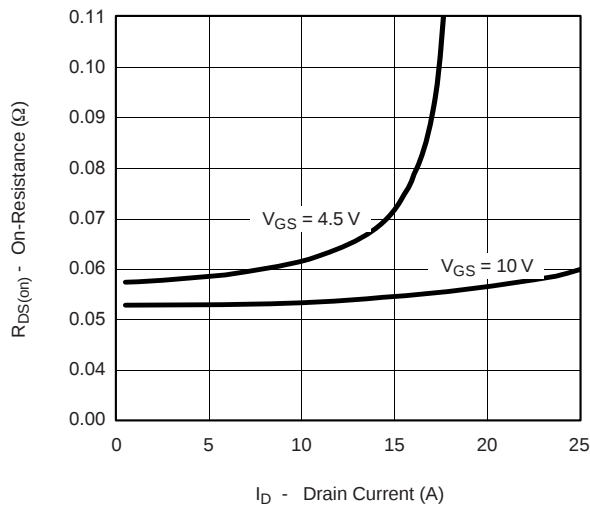
P-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



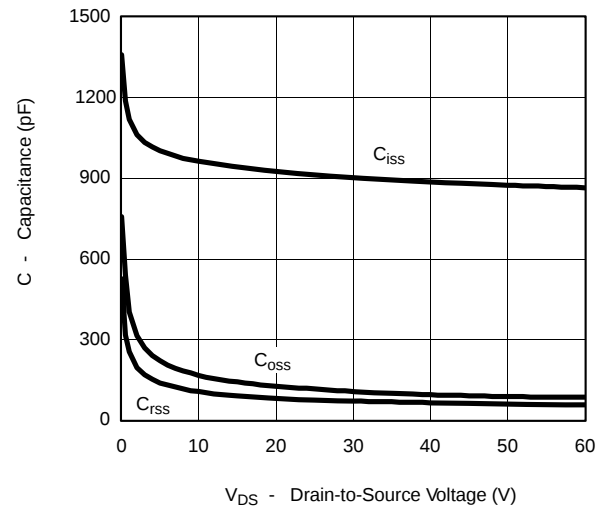
Output Characteristics



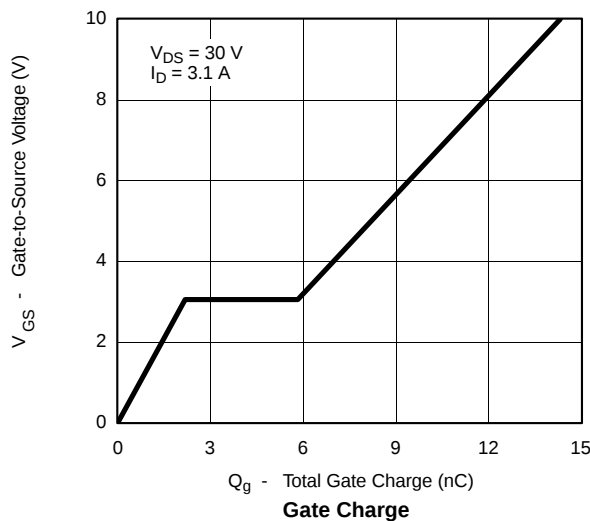
Transfer Characteristics



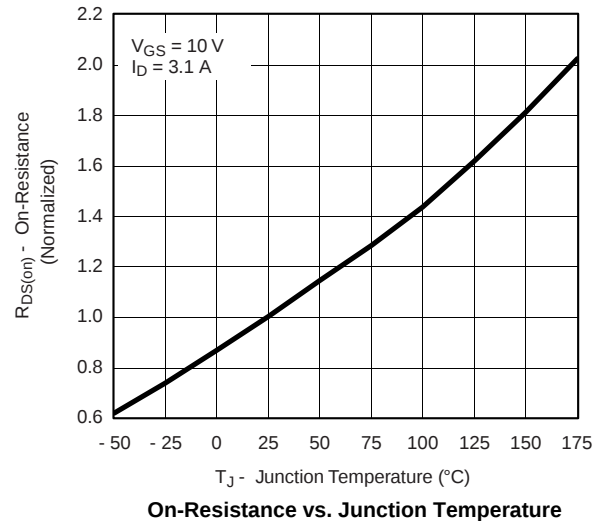
On-Resistance vs. Drain Current



Capacitance

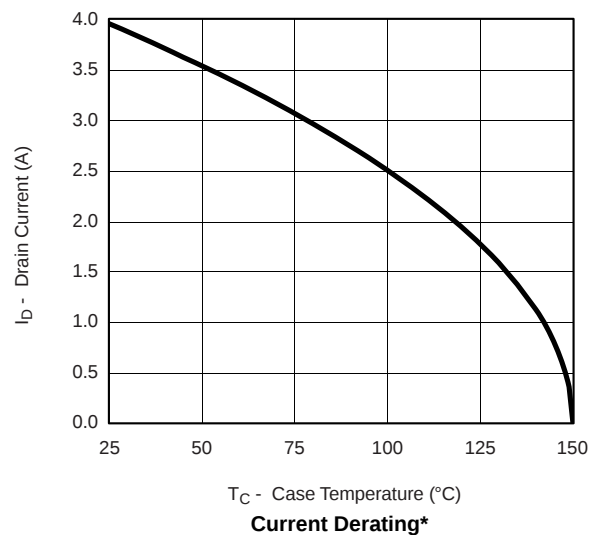
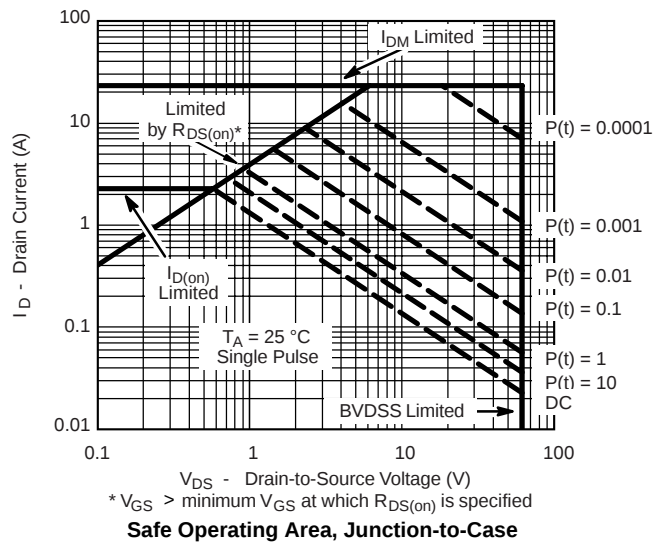
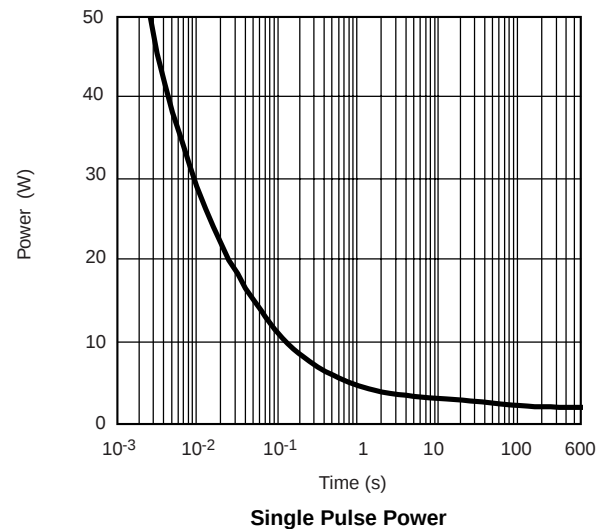
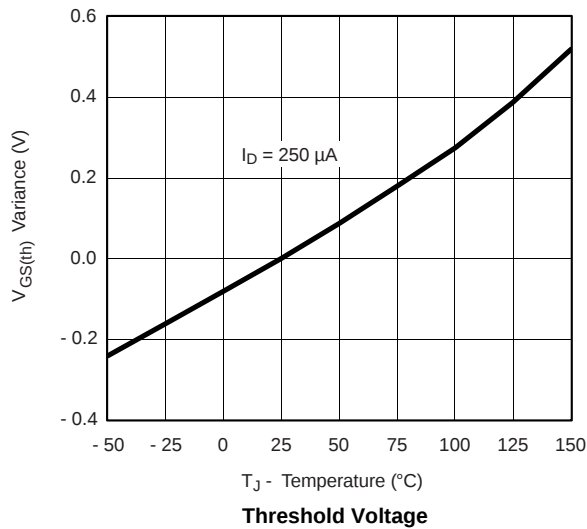
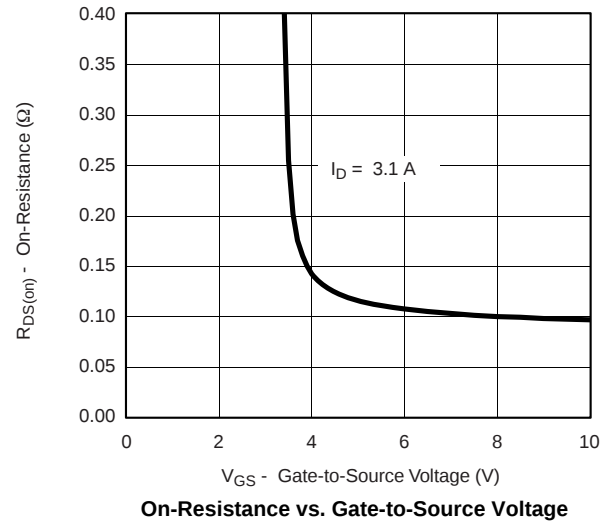
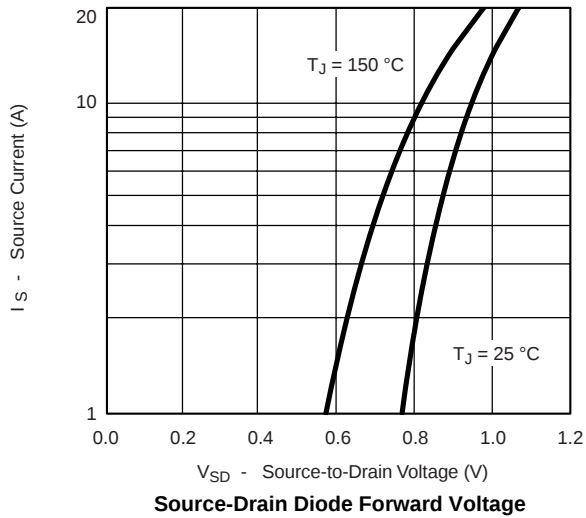


Gate Charge

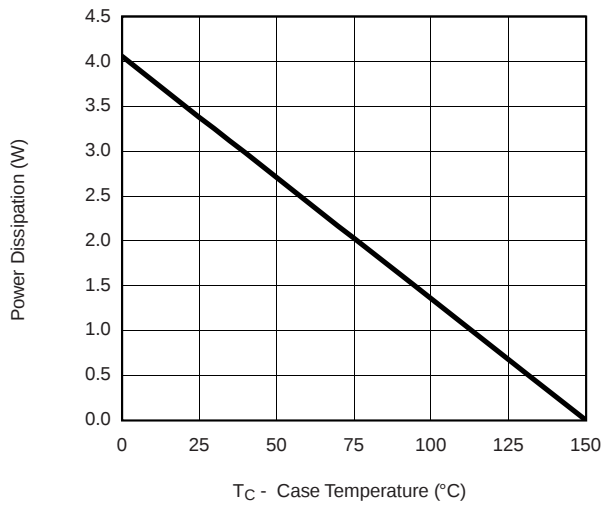


On-Resistance vs. Junction Temperature

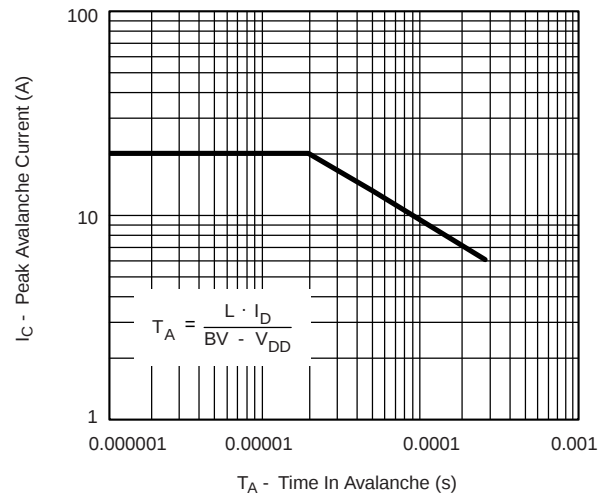
P-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



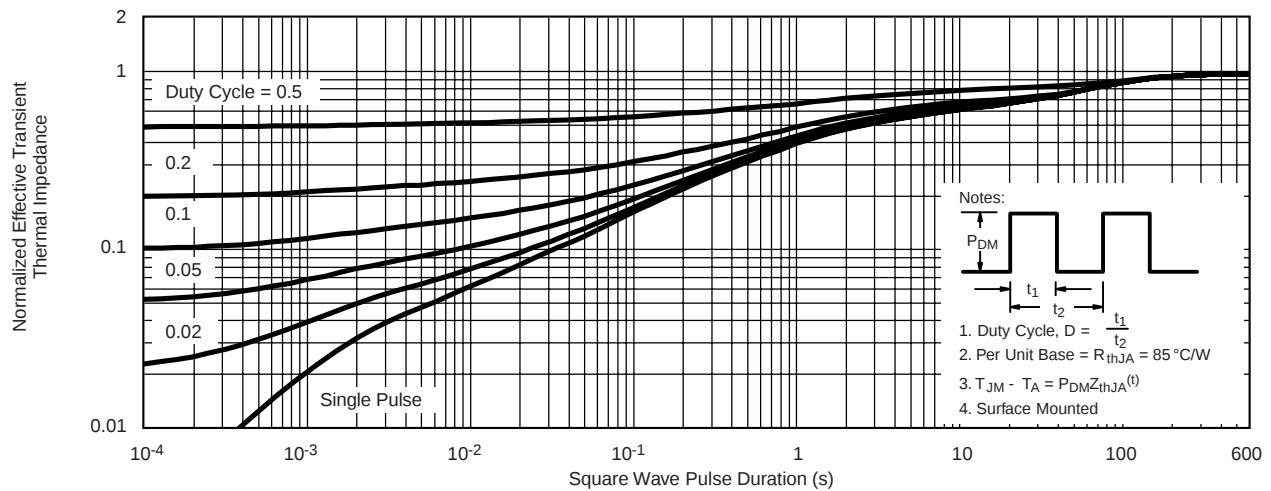
P-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



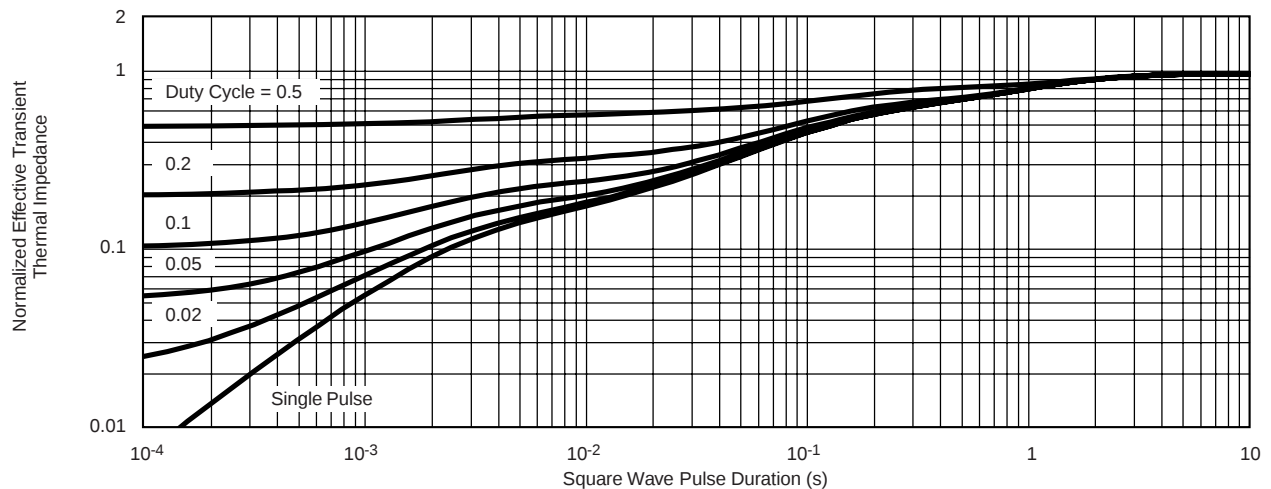
Power Derating, Junction-to-Foot



Single Pulse Avalanche Capability



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot