

## P-Channel 20-V (D-S) MOSFET

### Key Features:

- Low  $r_{DS(on)}$  trench technology
- Low thermal impedance
- 2mm x 2mm footprint DFN package
- RDS rated at 1.8V Gate-drive

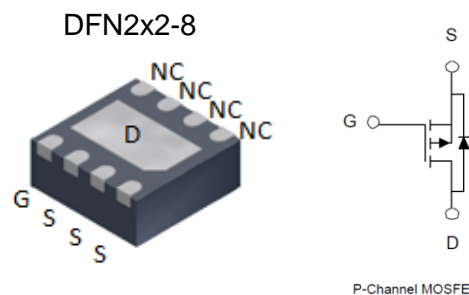
### Typical Applications:

- Battery Powered Instruments
- Portable Computing
- Mobile Phones
- GPS Units and Media Players



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
-20	42 @ $V_{GS} = -4.5V$	-6.6
	57 @ $V_{GS} = -2.5V$	-5.7
	86 @ $V_{GS} = -1.8V$	-1



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		$V_{DS}$	-20	V
Gate-Source Voltage		$V_{GS}$	$\pm 8$	
Continuous Drain Current <sup>a</sup>	$T_A = 25^\circ C$	$I_D$	-6.6	A
	$T_A = 70^\circ C$		-5.3	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	-20	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	4	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ C$	$P_D$	3	W
	$T_A = 70^\circ C$		1.92	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	$^\circ C$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec	$R_{\theta JA}$	40	$^\circ C/W$
	Steady State		90	

### Notes

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

## Electrical Characteristics

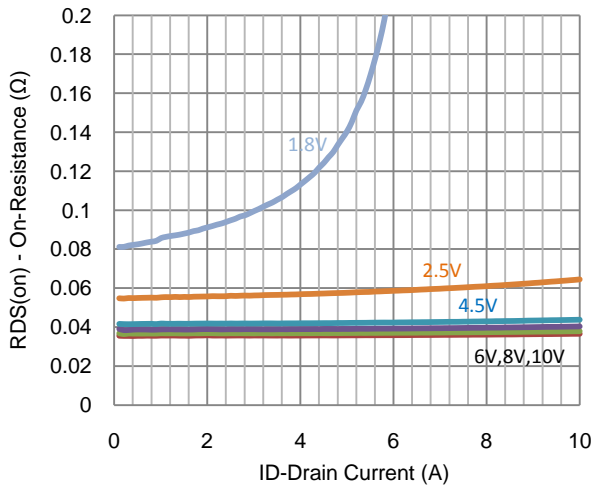
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-0.4			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = -8 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -16 V, V_{GS} = 0 V$			1	uA
		$V_{DS} = -16 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -4.5 V$	-10			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = -4.5 V, I_D = -4.4 A$			42	m $\Omega$
		$V_{GS} = -2.5 V, I_D = -3.6 A$			57	
		$V_{GS} = -1.8 V, I_D = -1 A$			86	
Forward Transconductance	$g_{fs}$	$V_{DS} = -15 V, I_D = -4.4 A$		20		S
Diode Forward Voltage	$V_{SD}$	$I_S = -2 A, V_{GS} = 0 V$		0.83		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = -10 V, V_{GS} = -4.5 V,$ $I_D = -4.4 A$		6.8		nC
Gate-Source Charge	$Q_{gs}$			1.8		
Gate-Drain Charge	$Q_{gd}$			2.3		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10 V, R_L = 2.3 \Omega, I_D = -4.4 A,$ $V_{GEN} = -4.5 V, R_{GEN} = 6 \Omega$		6		ns
Rise Time	$t_r$			6		
Turn-Off Delay Time	$t_{d(off)}$			23		
Fall Time	$t_f$			15		
Input Capacitance	$C_{iss}$	$V_{DS} = -15 V, V_{GS} = 0 V, f = 1 MHz$		837		pF
Output Capacitance	$C_{oss}$			98		
Reverse Transfer Capacitance	$C_{rss}$			75		
Gate Resistance	$R_g$	$f = 1 MHz$		3.7		$\Omega$

## Notes

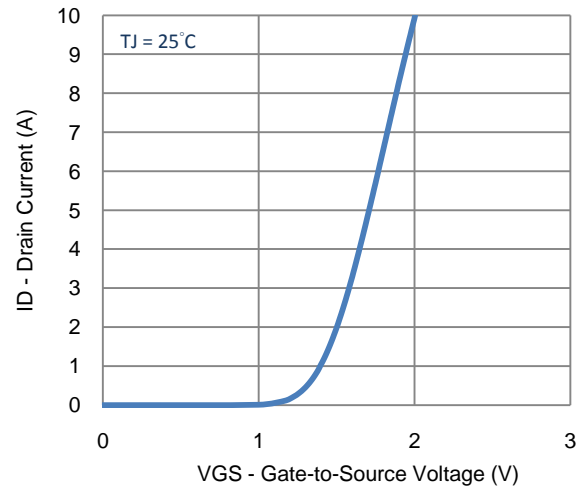
- Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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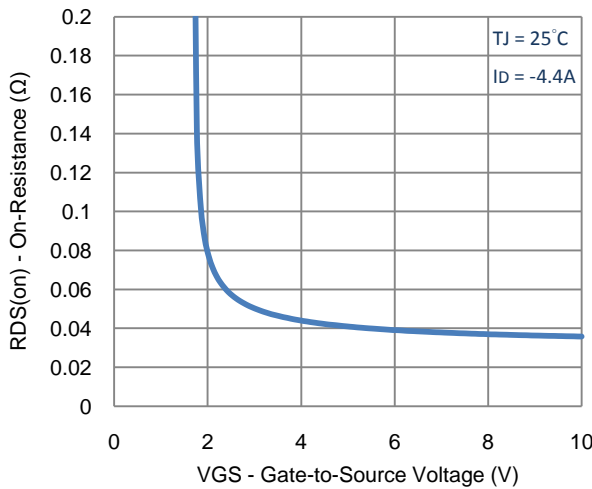
Typical Electrical Characteristics



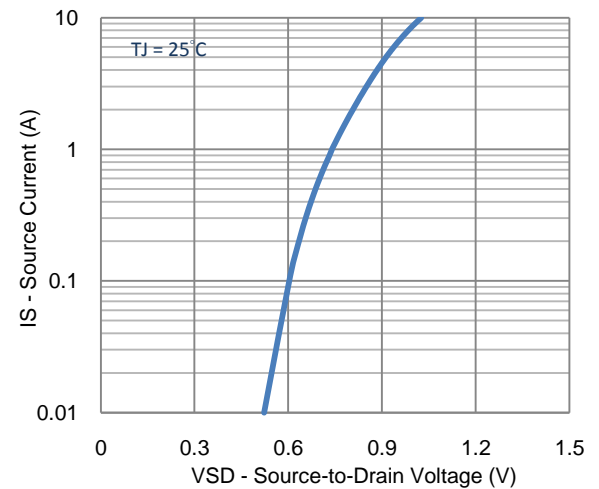
1. On-Resistance vs. Drain Current



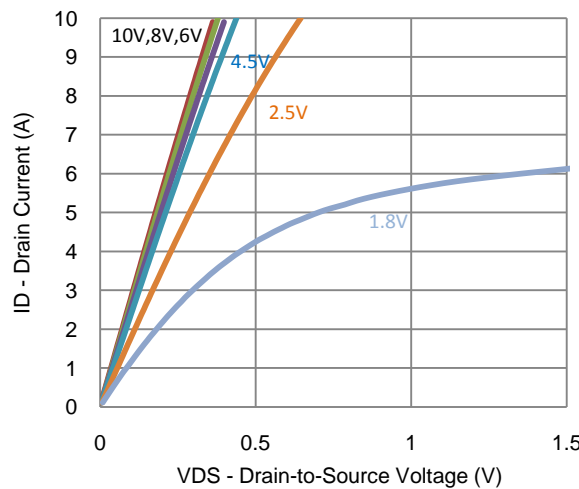
2. Transfer Characteristics



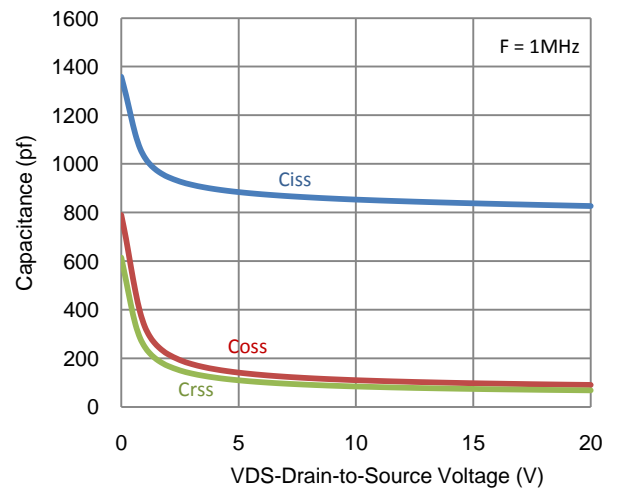
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

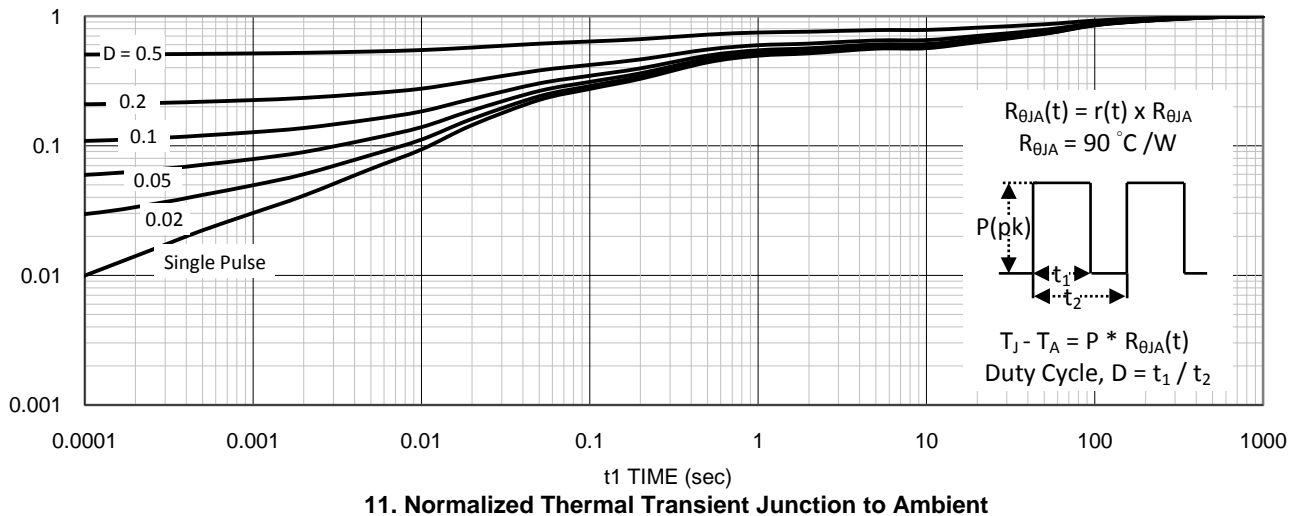
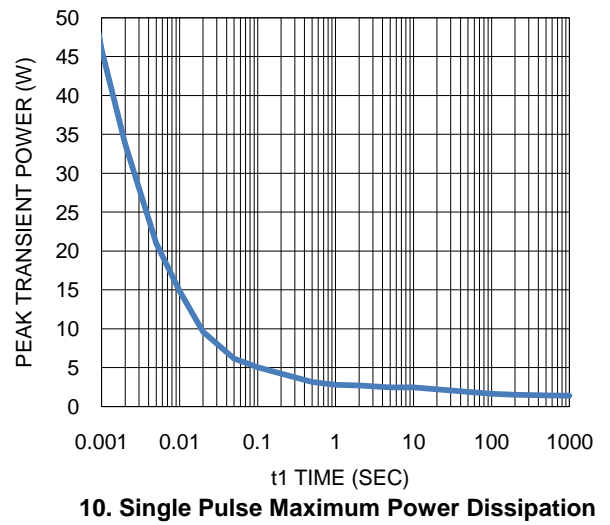
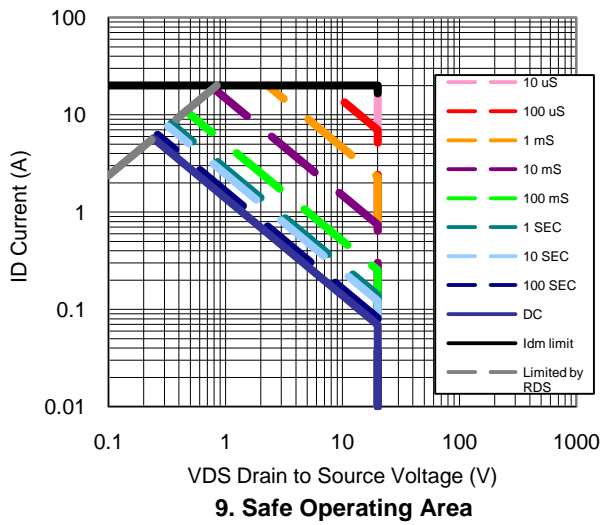
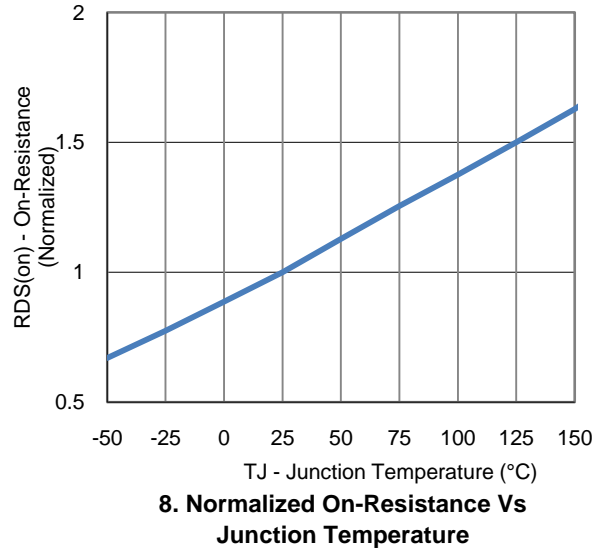
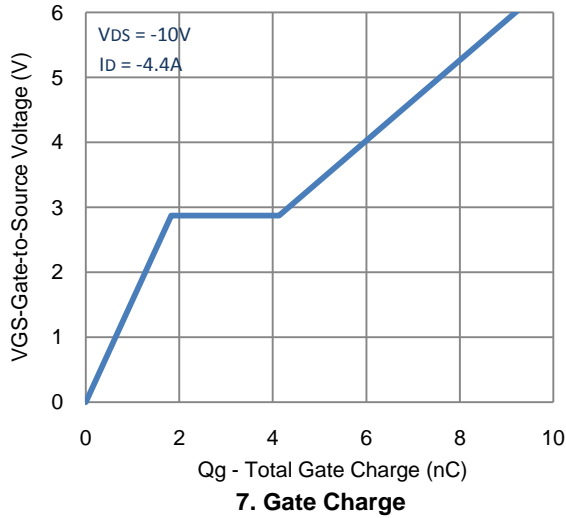


5. Output Characteristics



6. Capacitance

Typical Electrical Characteristics



Package Information

