N-Channel 20-V (D-S) MOSFET

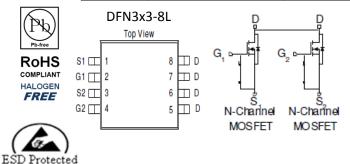
Key Features:

- Low r_{DS(on)} trench technology
- · Low thermal impedance
- · Fast switching speed

Typical Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY				
V _{DS} (V)	$r_{DS(on)}(m\Omega)$	I _D (A)		
	20 @ V _{GS} = 4.5V	7.1		
20	24 @ V _{GS} = 2.5V	6.5		
	39 @ V _{GS} = 1.8V	5.1		



ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Limit	Units			
Drain-Source Voltage	-Source Voltage					
Gate-Source Voltage		V _{GS}	±8	V		
Continuous Danie Commental	T _A =25°	C ,	7.1	А		
Continuous Drain Current a	T _A =70°	C I _D	5.8			
Pulsed Drain Current ^b		I _{DM}	40			
Continuous Source Current (Diode Conduction) ^a		Is	2.1	Α		
Device Discipation 8	T _A =25°°	C P _D	1.5	W		
Power Dissipation ^a	T _A =70°	C	1	V V		
Operating Junction and Storage Temperature Range	-	T _J , T _{sta}	-55 to 150	°C		

2000V

THERMAL RESISTANCE RATINGS							
Parameter	Symbol	Maximum	Units				
Maximum Junction-to-Ambient ^a	t <= 10 sec	$R_{\theta JA}$	83	°C/W			
IMAXIMUM Sunction-to-Ambient	Steady State	ГХ⊕ЈА	120	C/VV			

Notes

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

Electrical Characteristics

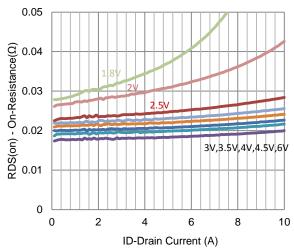
Parameter	Symbol	Test Conditions	Min	Тур	Max	Unit	
Static							
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250 \text{ uA}$	0.4			V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 8 \text{ V}$			±100	nA	
Zero Gate Voltage Drain Current	l	$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}$			1	uA	
Zero Gate Voltage Brain Gurrent	I _{DSS}	$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55^{\circ}\text{C}$			25	uA	
On-State Drain Current	I _{D(on)}	$V_{DS} = 5 \text{ V}, V_{GS} = 4.5 \text{ V}$	10			Α	
		$V_{GS} = 4.5 \text{ V}, I_D = 5.7 \text{ A}$			20		
Drain-Source On-Resistance	r _{DS(on)}	$V_{GS} = 2.5 \text{ V}, I_D = 5.2 \text{ A}$			24	mΩ	
		$V_{GS} = 1.8 \text{ V}, I_D = 4.8 \text{ A}$			39		
Forward Transconductance	g _{fs}	$V_{DS} = 10 \text{ V}, I_{D} = 5.7 \text{ A}$		15		S	
Diode Forward Voltage	V_{SD}	$I_S = 1.1 A, V_{GS} = 0 V$		0.71		V	
		Dynamic					
Total Gate Charge	Q_g	$V_{DS} = 10 \text{ V}, V_{GS} = 4.5 \text{ V},$		6			
Gate-Source Charge	Q_gs	$I_{D} = 5.7 \text{ A}$		0.9		nC	
Gate-Drain Charge	Q_gd	1D = 0.7 A		2.5			
Turn-On Delay Time	t _{d(on)}	$V_{DS} = 10 \text{ V}, R_{L} = 1.8 \Omega,$		8			
Rise Time	t _r	$V_{DS} = 10 \text{ V}, \text{ K}_{L} - 1.6 \Omega,$ $I_{D} = 5.7 \text{ A}.$		14		ns	
Turn-Off Delay Time	t _{d(off)}	$V_{GEN} = 4.5 \text{ V}, R_{GEN} = 6 \Omega$		42		118	
Fall Time	t_f	V GEN - 4.0 V, I (GEN - 0.12		17			
Input Capacitance	C _{iss}			439			
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		78		pF	
Reverse Transfer Capacitance	C_{rss}			68			

Notes

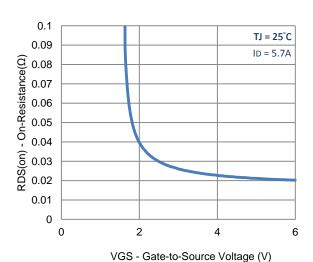
- a. Pulse test: PW <= 300us duty cycle <= 2%.
- b. Guaranteed by design, not subject to production testing.

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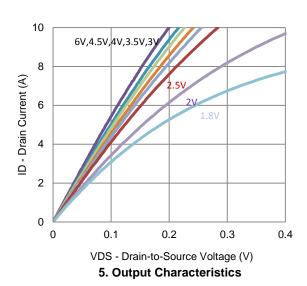
Typical Electrical Characteristics

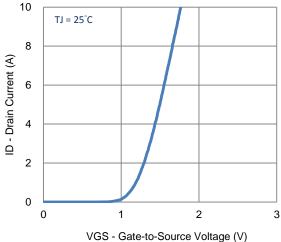


1. On-Resistance vs. Drain Current

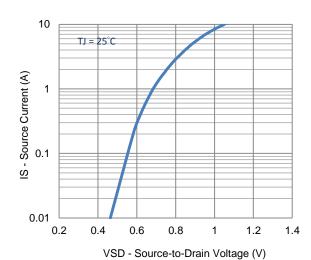


3. On-Resistance vs. Gate-to-Source Voltage

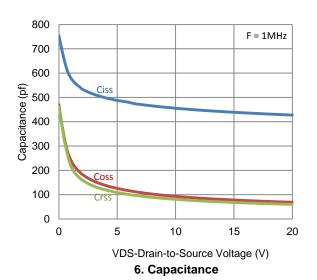




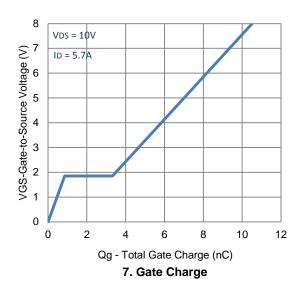
2. Transfer Characteristics

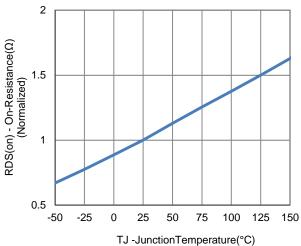


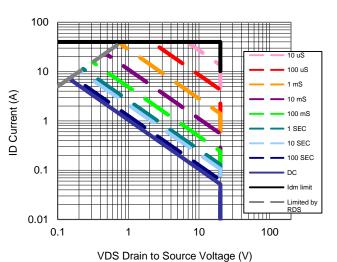
4. Drain-to-Source Forward Voltage



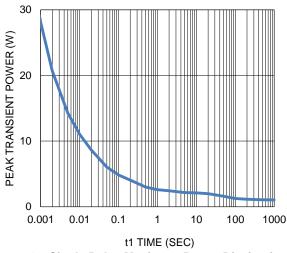
Typical Electrical Characteristics





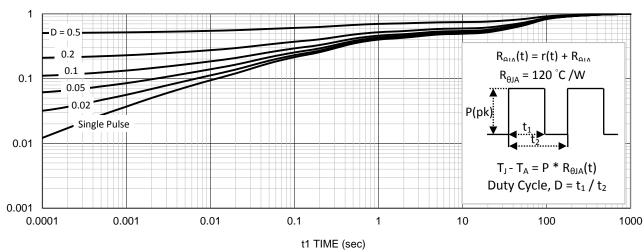






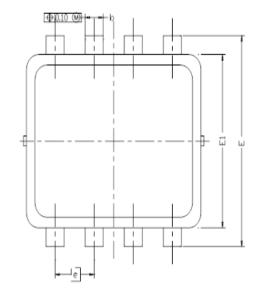


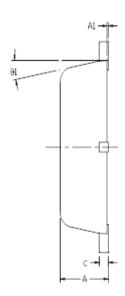
10. Single Pulse Maximum Power Dissipation

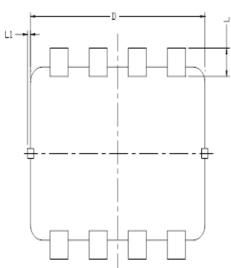


11. Normalized Thermal Transient Junction to Ambient

Package Information







DIM.	MILLIMETERS			INCHES			
	MIN	NDM	MAX	MIN	NDM	MAX	
Α	0.700	0.80	0.900	0.0276	0.0315	0.0354	
A1	0.00		0,05	0,000		0.002	
b	0,24	0,30	0,35	0.009	0.012	0.014	
_	0.08	0.152	0.25	0.003	0,006	0.010	
D	2.90 BSC			0.114 BSC			
E	2.80 BSC 0.110			.110 BS	С		
E1	2.30 BSC			0.091 BSC			
6	0.65 BSC			0.026 BSC			
L	0.20	0.375	0.450	0.008	0.0148	0.0177	
L1	0		0.100	0		0.004	
91	0	10	12	0	10	12	