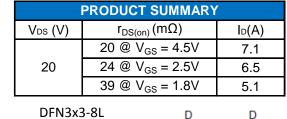
# N-Channel 20-V (D-S) MOSFET

### **Key Features:**

- Low r<sub>DS(on)</sub> trench technology
- · Low thermal impedance
- · Fast switching speed

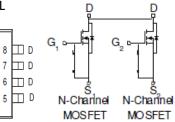
## **Typical Applications:**

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





Top View





ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^{\circ}C$ UNLESS OTHERWISE NOTED)							
Parameter			Symbol	Limit	Units		
Drain-Source Voltage			V <sub>DS</sub>	20	V		
Gate-Source Voltage			$V_{GS}$	±8	V		
Continuous Drain Current <sup>a</sup>		T <sub>A</sub> =25°C	1	7.1			
Continuous Drain Current <sup>a</sup>		T <sub>A</sub> =70°C	Ι <sub>D</sub>	5.8	А		
Pulsed Drain Current b			I <sub>DM</sub>	40			
Continuous Source Current (Diode Conduction) <sup>a</sup>			۱ <sub>s</sub>	2.1	А		
Dewer Dissipation <sup>a</sup>		T <sub>A</sub> =25°C	PD	1.5	W		
Power Dissipation <sup>a</sup>		T <sub>A</sub> =70°C	۰D	1	vv		
Operating Junction and Storage Temperature Range			T <sub>J</sub> , T <sub>stg</sub>	-55 to 150	°C		

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Maximum	Units		
Maximum Junction-to-Ambient <sup>a</sup>	t <= 10 sec	R <sub>eja</sub>	83	°C/W		
	Steady State	٩٢٩	120	0/11		

Notes

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

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Electrical	Characteristics

Parameter	Symbol	Test Conditions	Min	Тур	Max	Unit		
Static								
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_D = 250 \text{ uA}$	0.4			V		
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 V, V_{GS} = \pm 8 V$			±100	nA		
Zero Gate Voltage Drain Current	1	$V_{DS} = 16 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$			1	uA		
	I <sub>DSS</sub>	$V_{DS} = 16 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \text{ T}_{J} = 55^{\circ}\text{C}$			25	uA		
On-State Drain Current	I <sub>D(on)</sub>	$V_{DS} = 5 V, V_{GS} = 4.5 V$	10			А		
		$V_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 5.7 \text{ A}$	20		20			
Drain-Source On-Resistance	r <sub>DS(on)</sub>	$V_{GS} = 2.5 \text{ V}, \text{ I}_{D} = 5.2 \text{ A}$			24	mΩ		
		$V_{GS} = 1.8 \text{ V}, I_{D} = 4.8 \text{ A}$			39			
Forward Transconductance	<b>g</b> <sub>fs</sub>	$V_{DS} = 10 \text{ V}, \text{ I}_{D} = 5.7 \text{ A}$		15		S		
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 1.1 A, V <sub>GS</sub> = 0 V		0.71		V		
		Dynamic						
Total Gate Charge	Qg	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 4.5 V,		6				
Gate-Source Charge	$Q_gs$	$v_{DS} = 10 v, v_{GS} = 4.3 v,$ $I_{D} = 5.7 A$		0.9		nC		
Gate-Drain Charge	$Q_{gd}$	$n_{\rm D} = 3.7$ A		2.5				
Turn-On Delay Time	t <sub>d(on)</sub>	1010 - 180		8				
Rise Time	t <sub>r</sub>	$V_{DS} = 10 \text{ V}, \text{ R}_{L} = 1.8 \Omega,$ $I_{D} = 5.7 \text{ A}.$		14		ns		
Turn-Off Delay Time	t <sub>d(off)</sub>	$V_{GEN} = 4.5 \text{ V}, \text{ R}_{GEN} = 6 \Omega$		42				
Fall Time	t <sub>f</sub>	$v_{\text{GEN}} = \pm .0 v$ , $v_{\text{GEN}} = 0.02$		17				
Input Capacitance	C <sub>iss</sub>			439				
Output Capacitance	C <sub>oss</sub> C <sub>rss</sub>	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		78		pF		
Reverse Transfer Capacitance				68				

#### Notes

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

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0.8

10

6. Capacitance

VDS-Drain-to-Source Voltage (V)

5

1

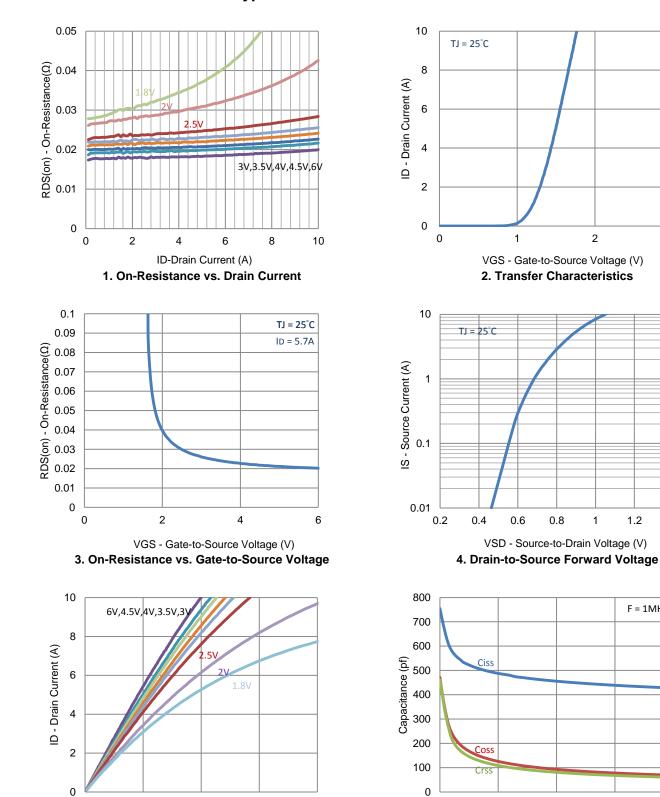
1.2

F = 1MHz

1.4

20

3



0.2

VDS - Drain-to-Source Voltage (V)

5. Output Characteristics

0.3

## **Typical Electrical Characteristics**

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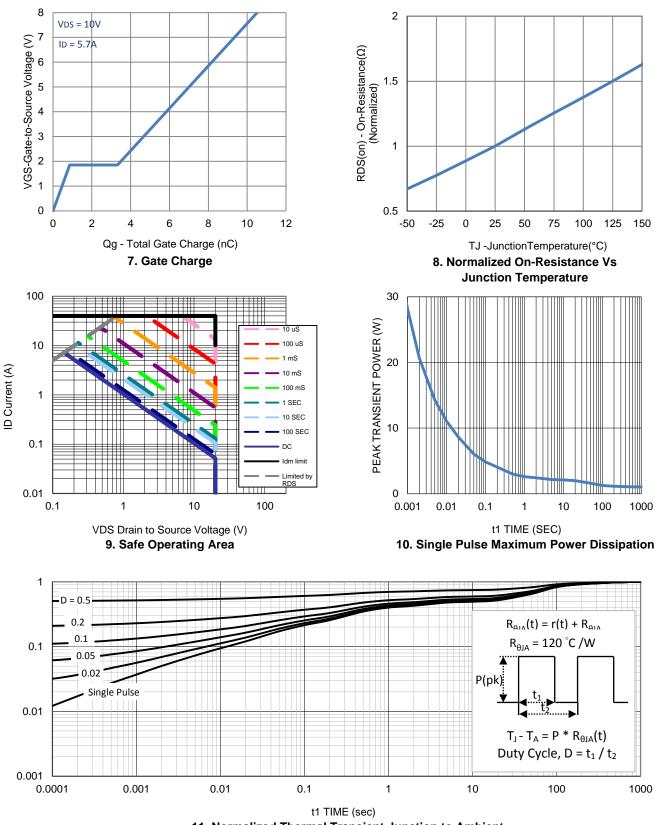
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0.4

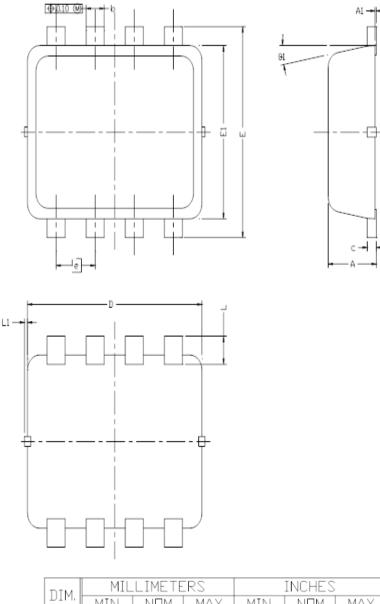
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## **Typical Electrical Characteristics**

11. Normalized Thermal Transient Junction to Ambient

## Package Information



DIM.	Mil	LIME I E	-RS		INCHES			
DIM	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		
C	0,08	0.152	0.25	0.003	0,006	0.010		
D	2	2.90 BSC			0.114 BSC			
E	2.80 BSC			0.110 BSC				
E1	2.30 BSC			0.091 BSC				
e	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		
01	0	10	12	0	10	12		