

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

Key Features:

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

Typical Applications:

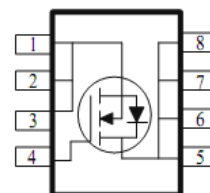
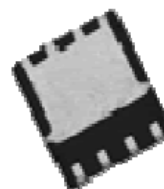
- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
20	2.5 @ $V_{GS} = 4.5V$	37
	4 @ $V_{GS} = 2.5V$	29



RoHS
COMPLIANT
HALOGEN
FREE

DFN5X6-8L



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current ^a	I_D	$T_A = 25^\circ\text{C}$	37
		$T_A = 70^\circ\text{C}$	29
Pulsed Drain Current ^b	I_{DM}	50	A
Continuous Source Current (Diode Conduction) ^a	I_S	8.1	A
Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	5
		$T_A = 70^\circ\text{C}$	3.2
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$R_{\theta JA}$	$t \leq 10$ sec	25
		Steady State	65

Notes

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

Electrical Characteristics

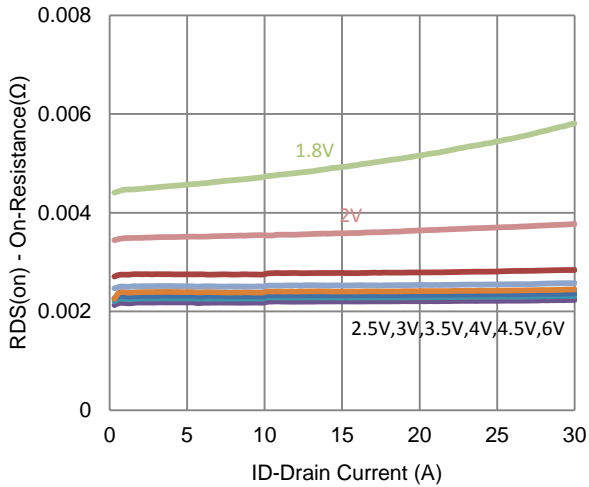
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	0.4			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 8 V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16 V, V_{GS} = 0 V$			1	uA
		$V_{DS} = 16 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 4.5 V$	30			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5 V, I_D = 20 A$			2.5	mΩ
		$V_{GS} = 2.5 V, I_D = 16 A$			4	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 V, I_D = 20 A$		32		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 4.1 A, V_{GS} = 0 V$		0.66		V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = 10 V, V_{GS} = 4.5 V,$ $I_D = 20 A$		105		nC
Gate-Source Charge	Q_{gs}			15		
Gate-Drain Charge	Q_{gd}			34		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 10 V, R_L = 0.5 \Omega,$ $I_D = 20 A,$ $V_{GEN} = 4.5 V, R_{GEN} = 6 \Omega$		48		ns
Rise Time	t_r			99		
Turn-Off Delay Time	$t_{d(off)}$			356		
Fall Time	t_f			160		
Input Capacitance	C_{iss}	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		18307		pF
Output Capacitance	C_{oss}			1505		
Reverse Transfer Capacitance	C_{rss}			1081		

Notes

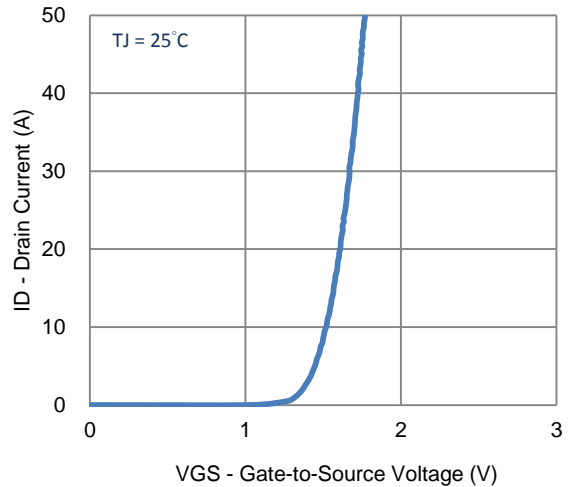
- Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

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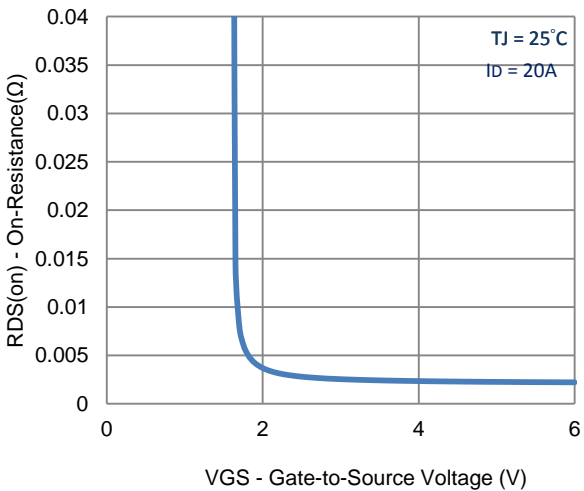
Typical Electrical Characteristics



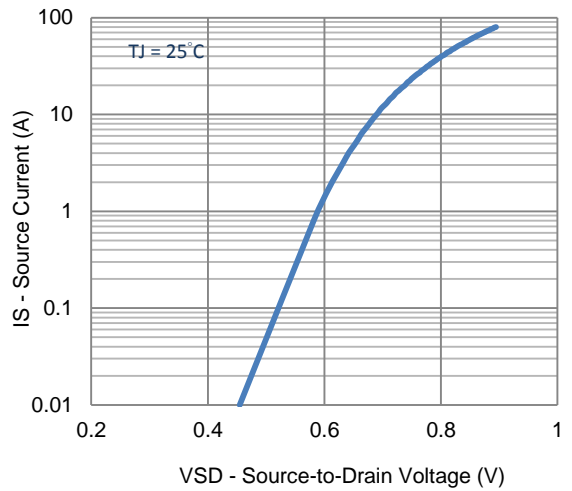
1. On-Resistance vs. Drain Current



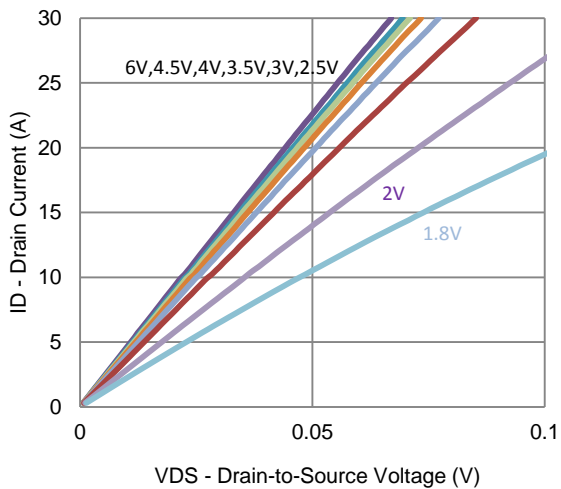
2. Transfer Characteristics



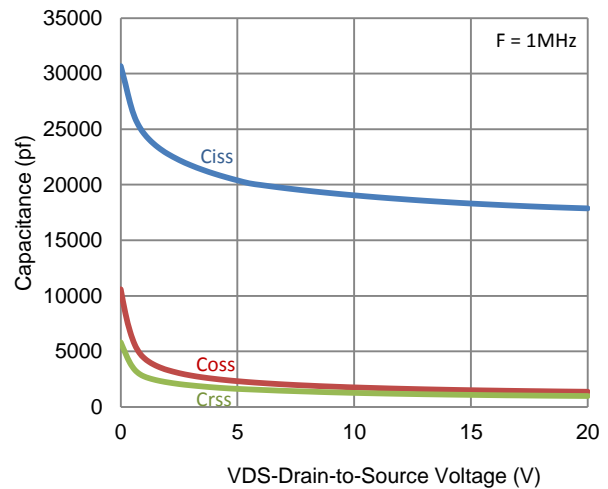
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

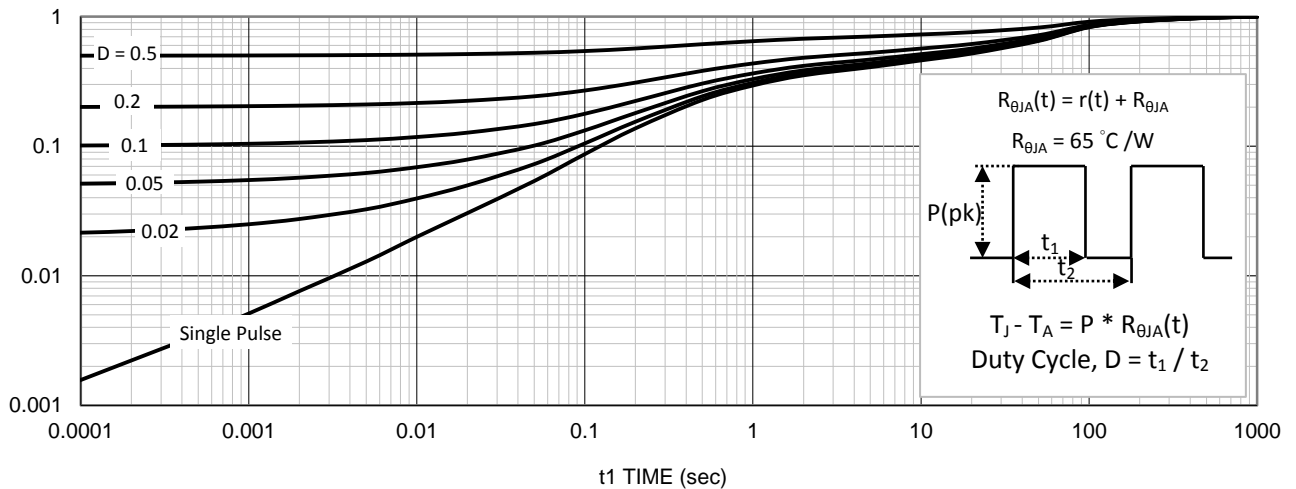
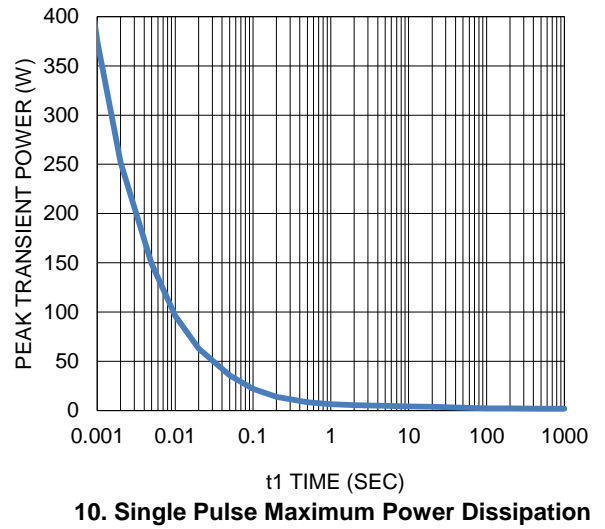
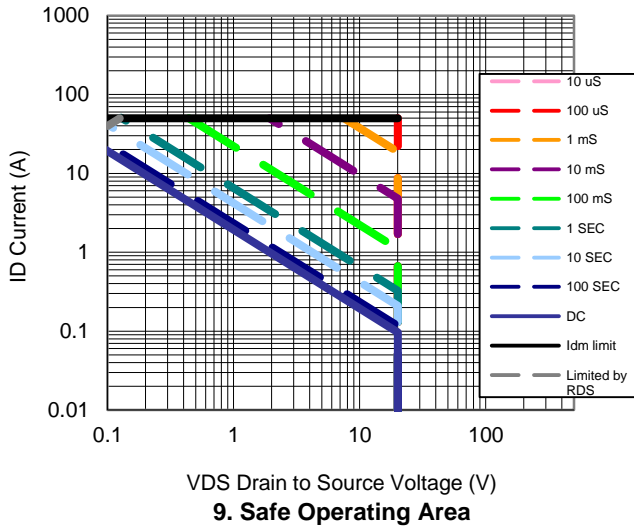
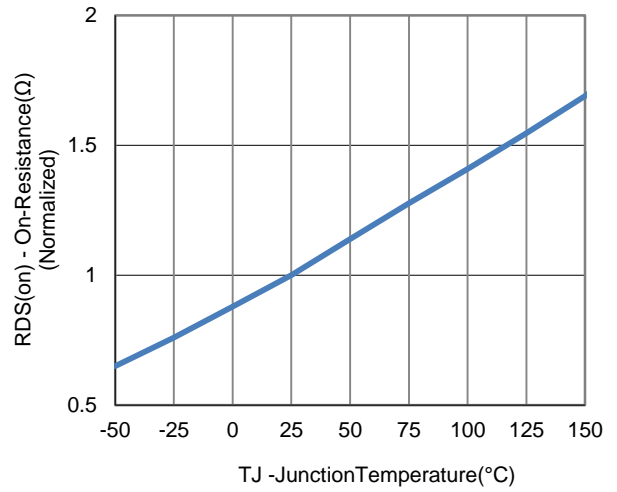
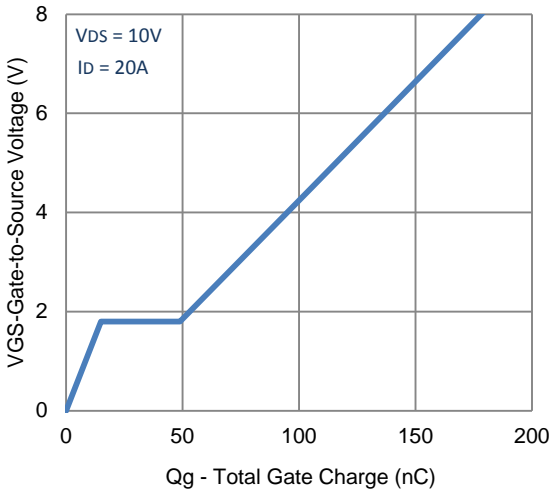


5. Output Characteristics

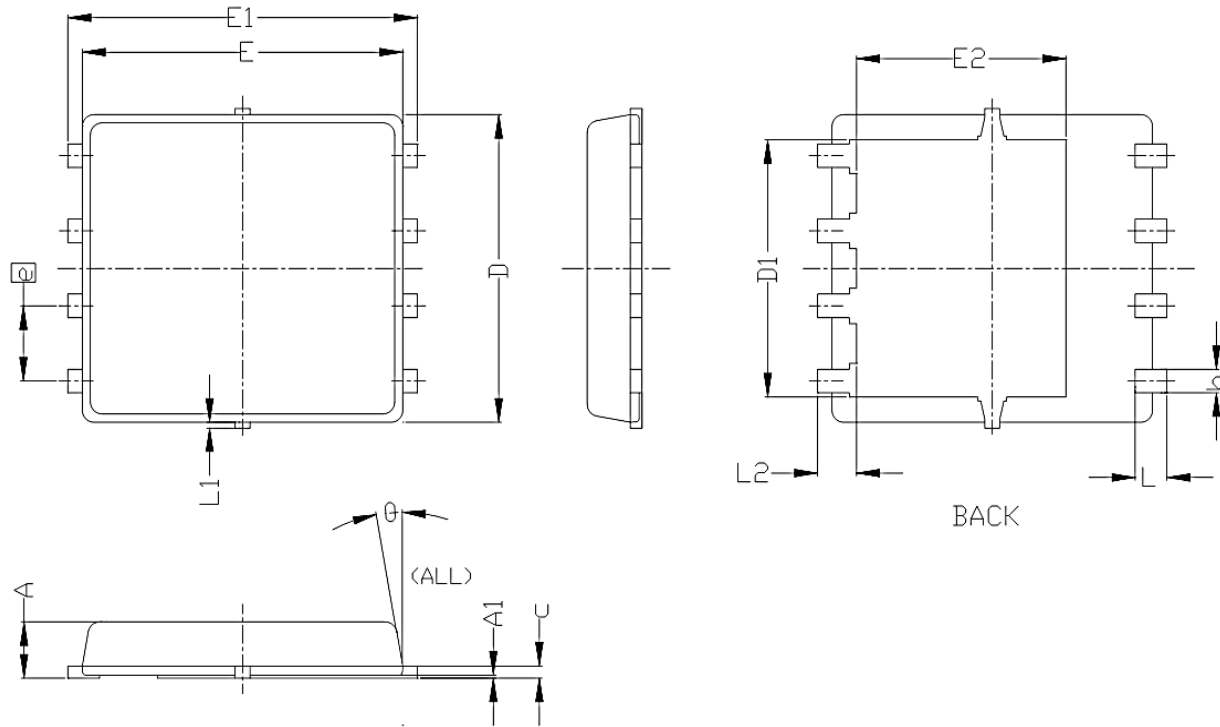


6. Capacitance

Typical Electrical Characteristics



Package Information



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	0.95	1.00	0.033	0.037	0.039
A1	0.00	---	0.05	0.000	---	0.002
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.15	0.20	0.25	0.006	0.008	0.010
D	5.20 BSC			0.205 BSC		
D1	4.35 BSC			0.171 BSC		
E	5.55 BSC			0.219 BSC		
E1	6.05 BSC			0.238 BSC		
E2	3.62 BSC			0.143 BSC		
e	1.27 BSC			0.050 BSC		
L	0.45	0.55	0.65	0.018	0.022	0.026
L1	0	---	0.15	0	---	0.006
L2	0.68 REF			0.027 REF		
θ	0°	---	10°	0°	---	10°