

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

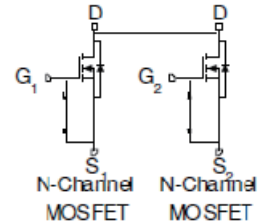
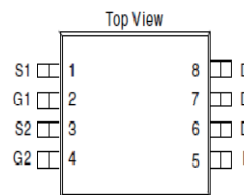
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
20	24 @ $V_{GS} = 4.5V$	7.1
	31 @ $V_{GS} = 2.5V$	6.5
	43 @ $V_{GS} = 1.8V$	5.1



RoHS
COMPLIANT
HALOGEN
FREE



DFN3x3-8L



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	
Continuous Drain Current ^a	$T_A = 25^\circ\text{C}$	I_D	A
	$T_A = 70^\circ\text{C}$	7.1	
Pulsed Drain Current ^b	I_{DM}	40	
Continuous Source Current (Diode Conduction) ^a	I_S	2.1	A
Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	W
	$T_A = 70^\circ\text{C}$	1.5	
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	$t \leq 10 \text{ sec}$	$R_{\theta JA}$	$^\circ\text{C/W}$
	Steady State	83	
		120	

Notes

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

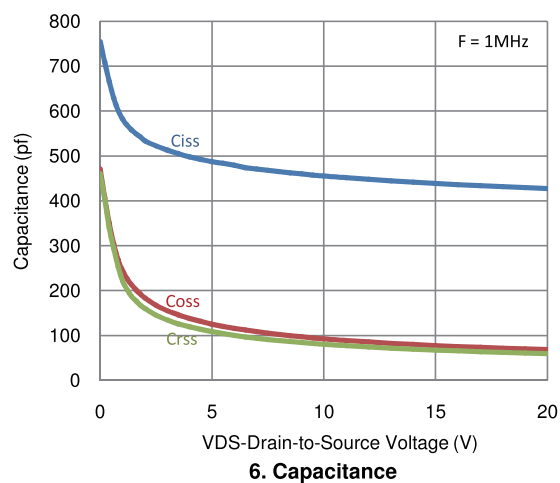
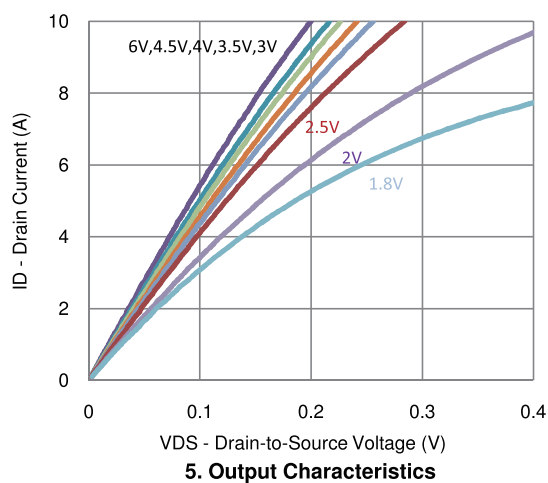
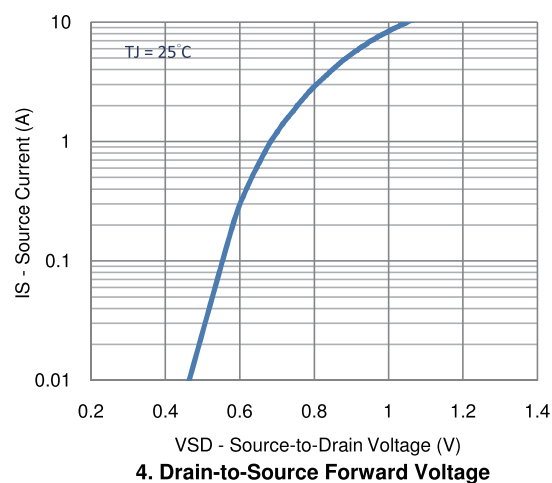
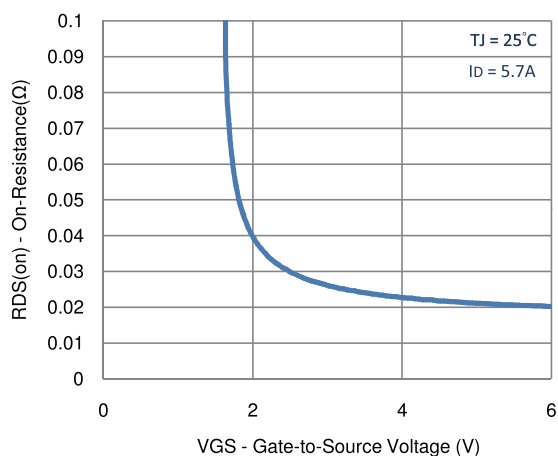
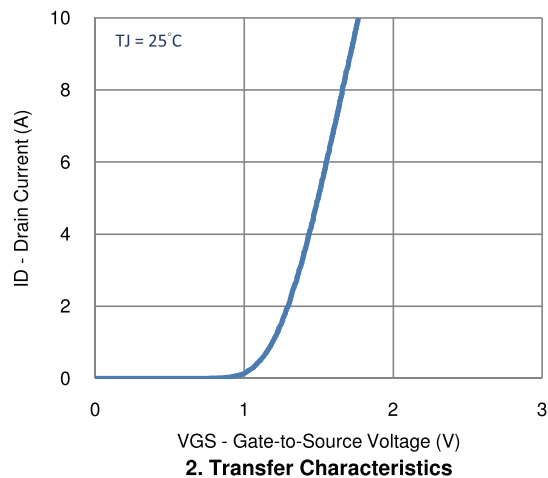
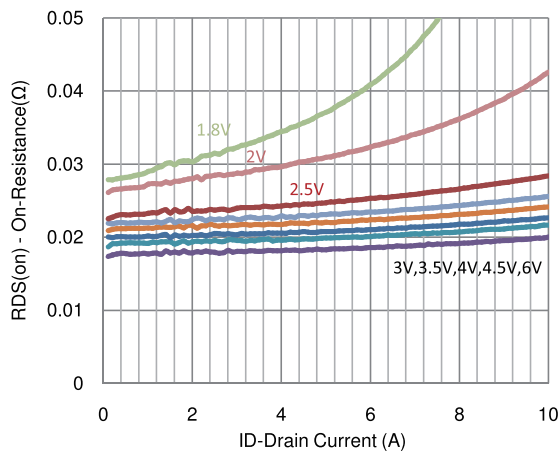
Electrical Characteristics

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	μA
		$V_{DS} = 16 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 4.5 V$	10			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 4.5 V, I_D = 2 A$		20	24	m Ω
		$V_{GS} = 2.5 V, I_D = 2 A$		24	31	
		$V_{GS} = 1.8 V, I_D = 2 A$		39	43	
Forward Transconductance	g_{fs}	$V_{DS} = 10 V, I_D = 5.7 A$		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	$V_{DS} = 10 V, V_{GS} = 4.5 V,$ $I_D = 5.7 A$		6.4		nC
Gate-Source Charge	Q_{gs}			0.9		
Gate-Drain Charge	Q_{gd}			2.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 10 V, R_L = 1.8 \Omega,$ $I_D = 5.7 A,$ $V_{GEN} = 4.5 V, R_{GEN} = 6 \Omega$		8		ns
Rise Time	t_r			14		
Turn-Off Delay Time	$t_{d(off)}$			42		
Fall Time	t_f			17		
Input Capacitance	C_{iss}	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		439		pF
Output Capacitance	C_{oss}			78		
Reverse Transfer Capacitance	C_{rss}			68		

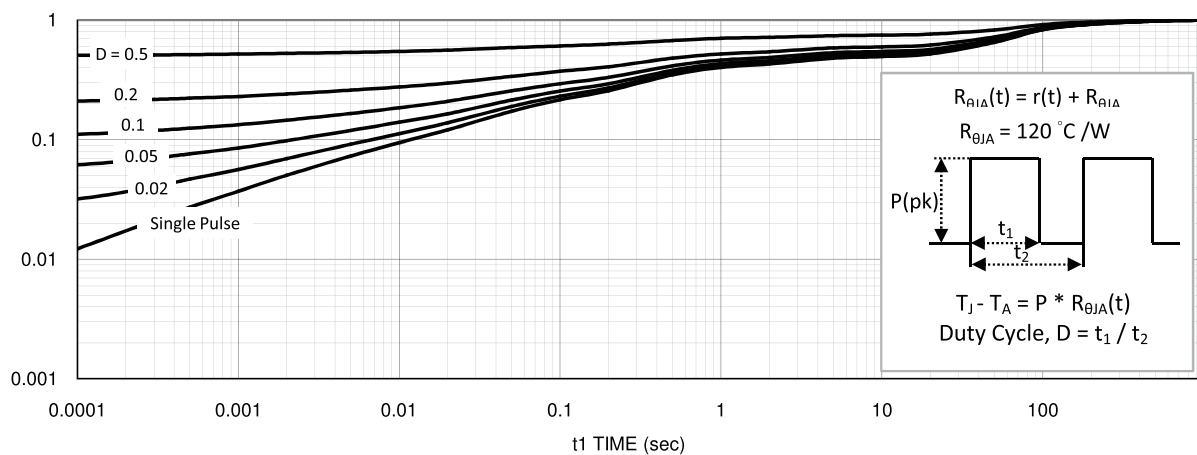
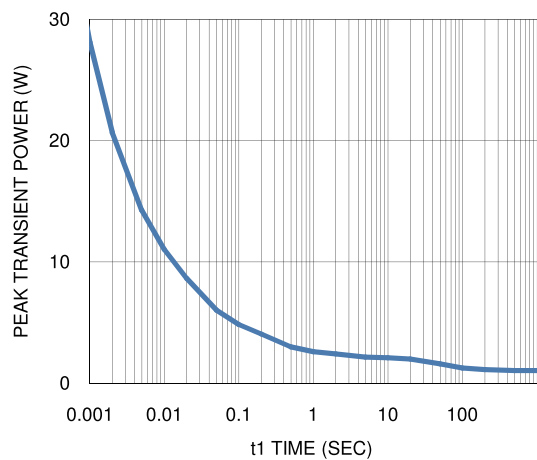
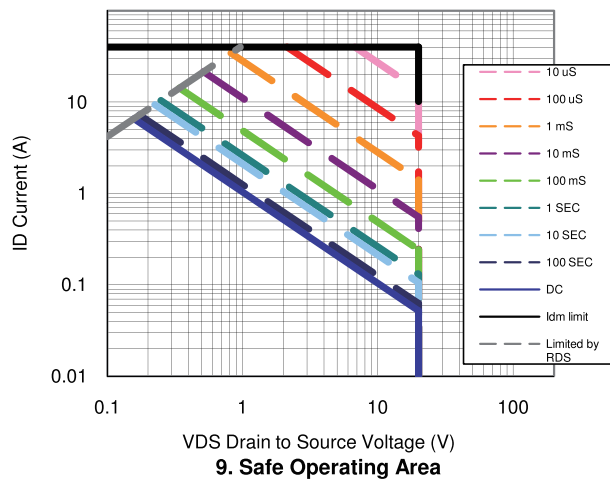
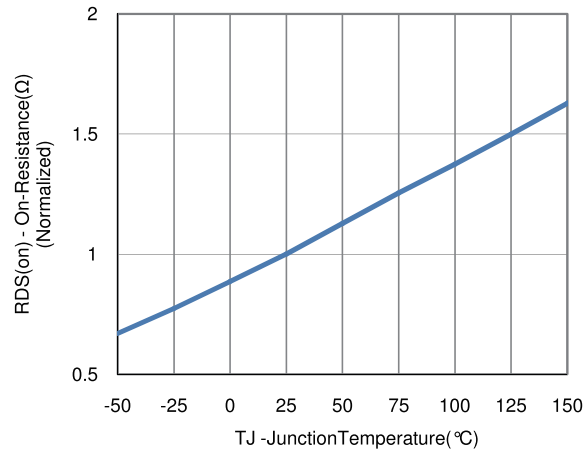
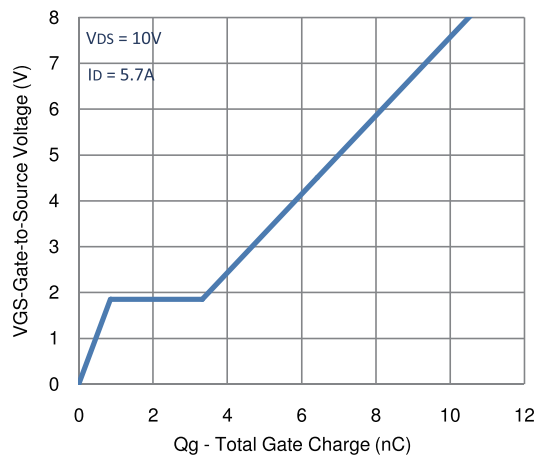
Notes

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

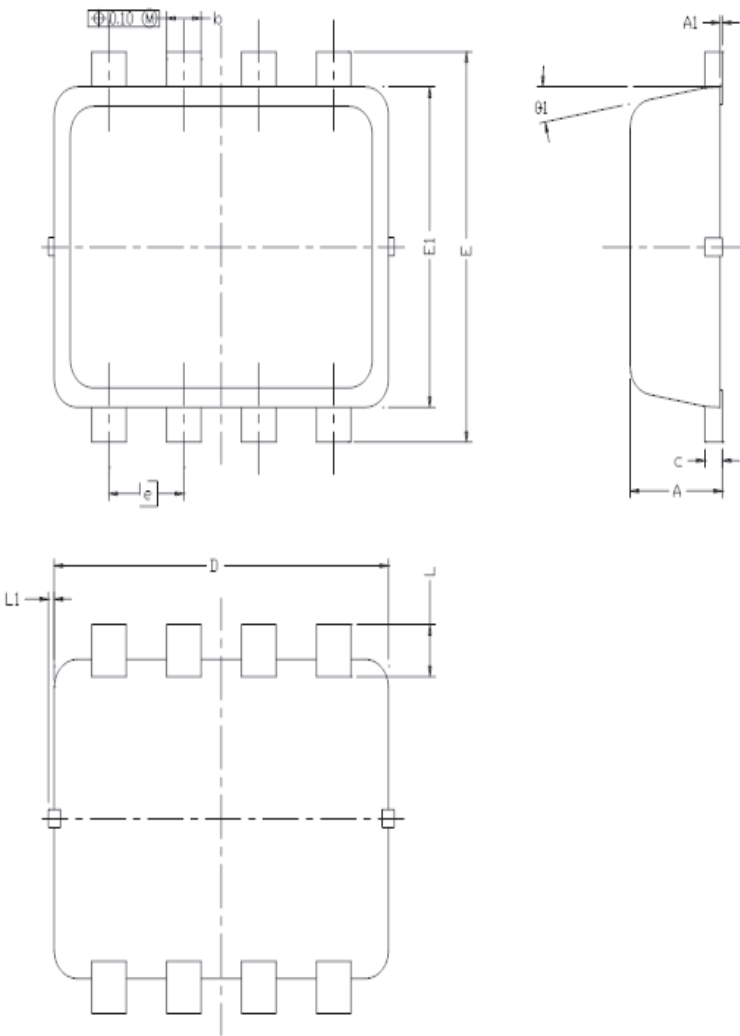
Typical Electrical Characteristics



Typical Electrical Characteristics



Package Information



DIM.	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	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	2.90 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
θ1	0	10	12	0	10	12