

N-Channel 40-V (D-S) MOSFET

Key Features:

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

Typical Applications:

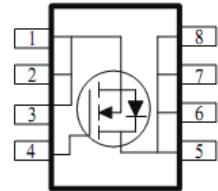
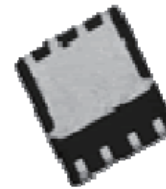
- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
40	3 @ $V_{GS} = 10V$	34
	5 @ $V_{GS} = 4.5V$	26



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}	40	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ^a	$T_A = 25^\circ\text{C}$	I_D	34	A
	$T_A = 70^\circ\text{C}$		27	
Pulsed Drain Current ^b		I_{DM}	100	
Continuous Source Current (Diode Conduction) ^a		I_S	8.1	A
Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	5	W
	$T_A = 70^\circ\text{C}$		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	$t \leq 10 \text{ sec}$	$R_{\theta JA}$	25	$^\circ\text{C/W}$
	Steady State		65	

Notes

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

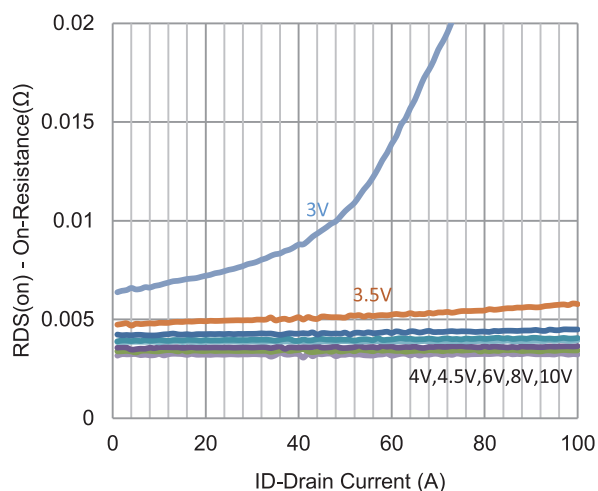
Electrical Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 32 V, V_{GS} = 0 V$			1	μA
		$V_{DS} = 32 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 10 V$	40			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 V, I_D = 20 A$			3	m Ω
		$V_{GS} = 4.5 V, I_D = 16 A$			5	
Forward Transconductance	g_{fs}	$V_{DS} = 15 V, I_D = 20 A$		25		S
Diode Forward Voltage	V_{SD}	$I_S = 4.1 A, V_{GS} = 0 V$		0.69		V
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = 20 V, V_{GS} = 4.5 V,$ $I_D = 20 A$		49		nC
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			23		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 20 V, R_L = 1 \Omega,$ $I_D = 20 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$		19		ns
Rise Time	t_r			35		
Turn-Off Delay Time	$t_{d(off)}$			209		
Fall Time	t_f			88		
Input Capacitance	C_{iss}	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		6861		pF
Output Capacitance	C_{oss}			791		
Reverse Transfer Capacitance	C_{rss}			653		

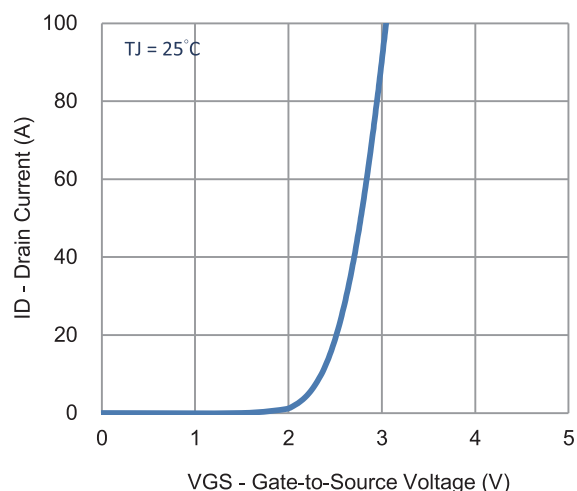
Notes

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

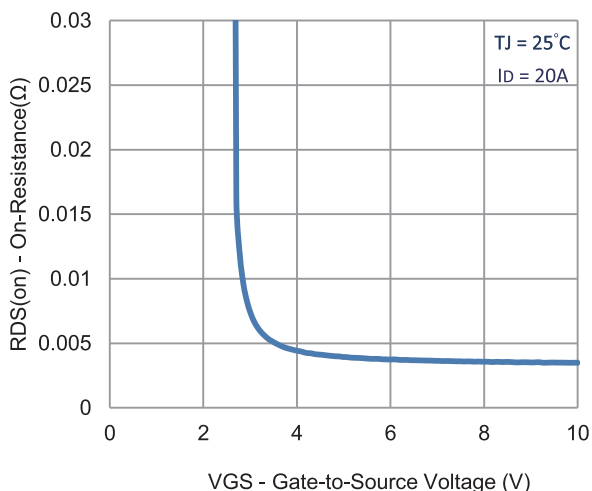
Typical Electrical Characteristics



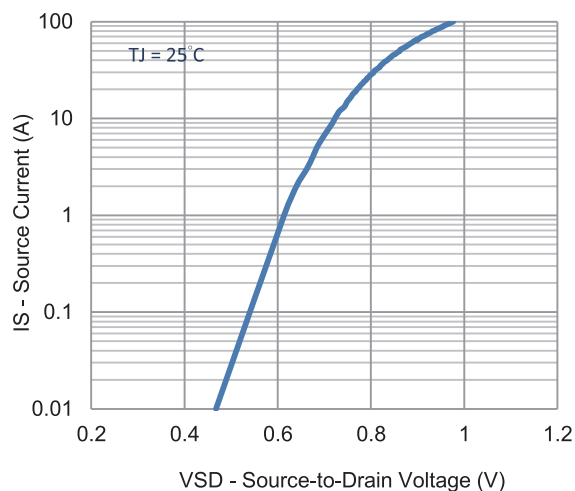
1. On-Resistance vs. Drain Current



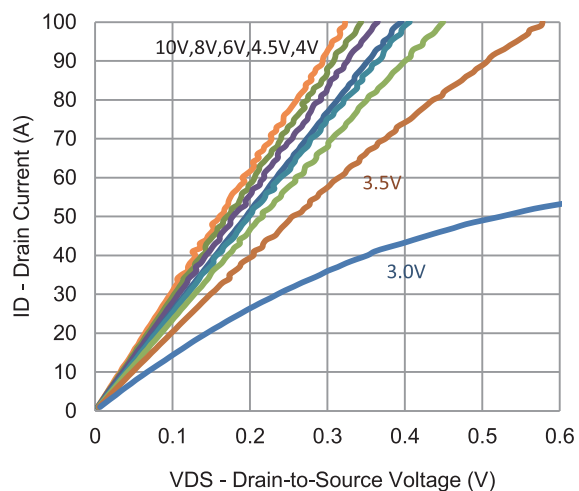
2. Transfer Characteristics



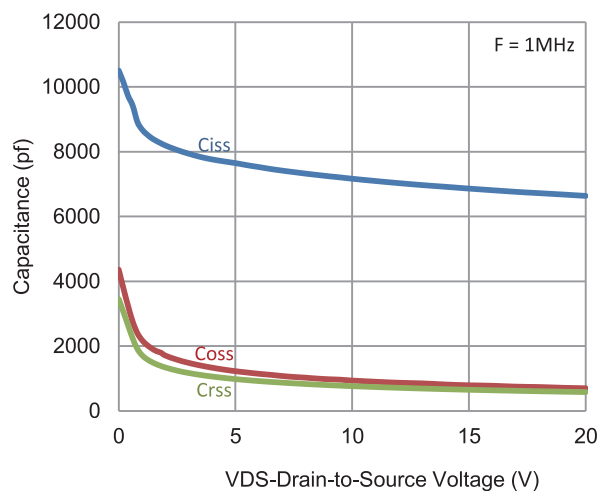
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

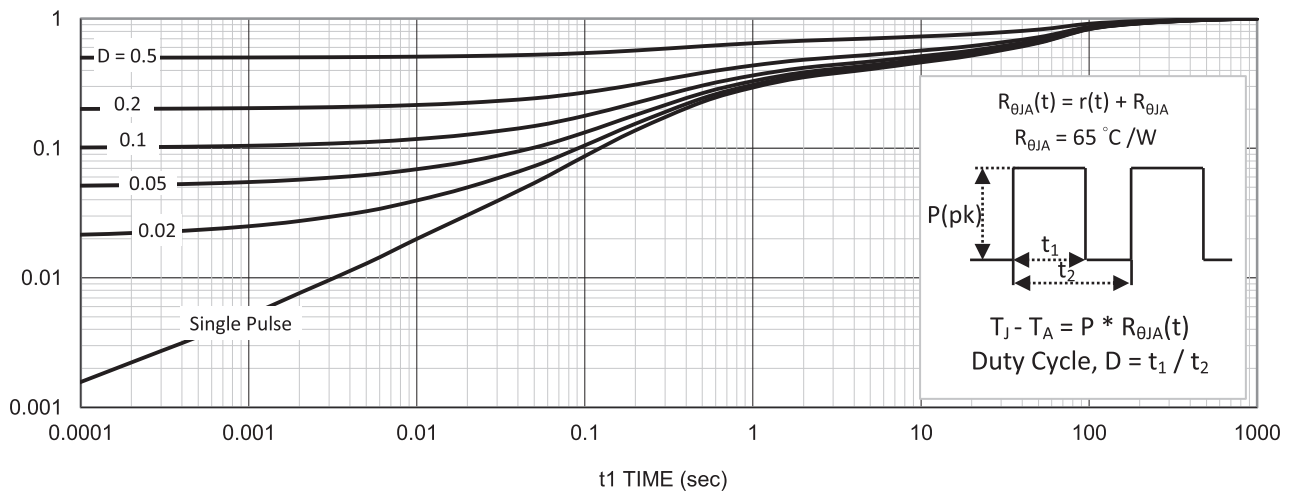
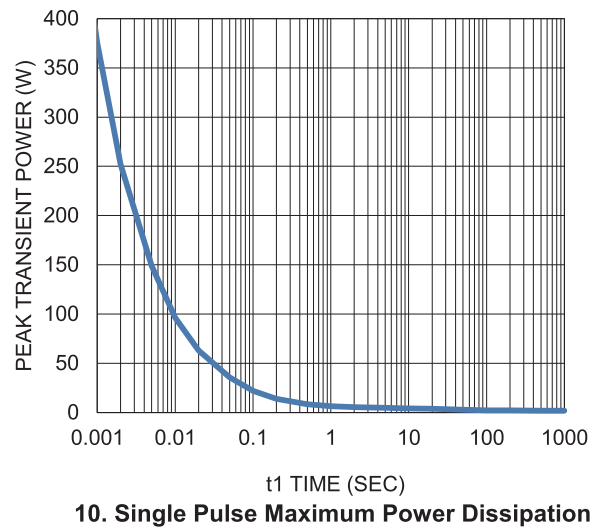
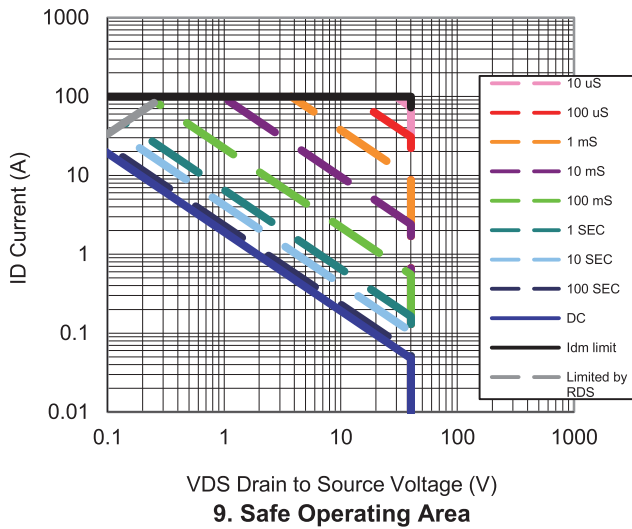
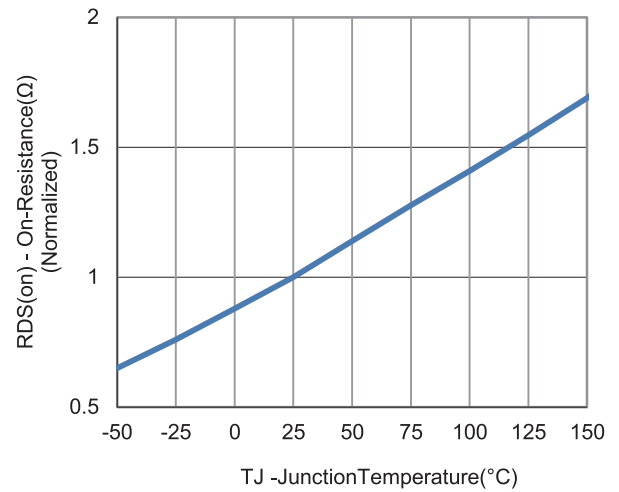
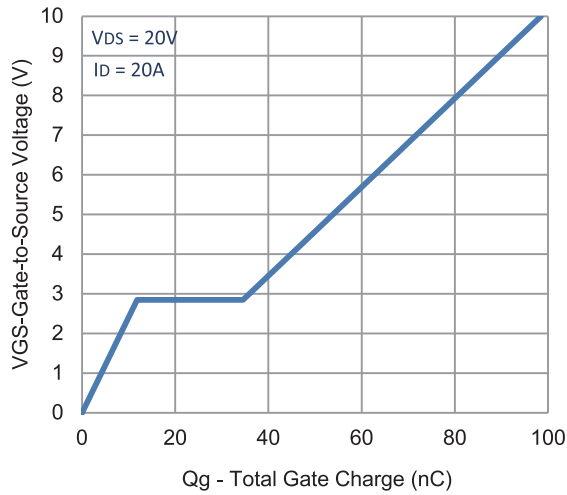


5. Output Characteristics

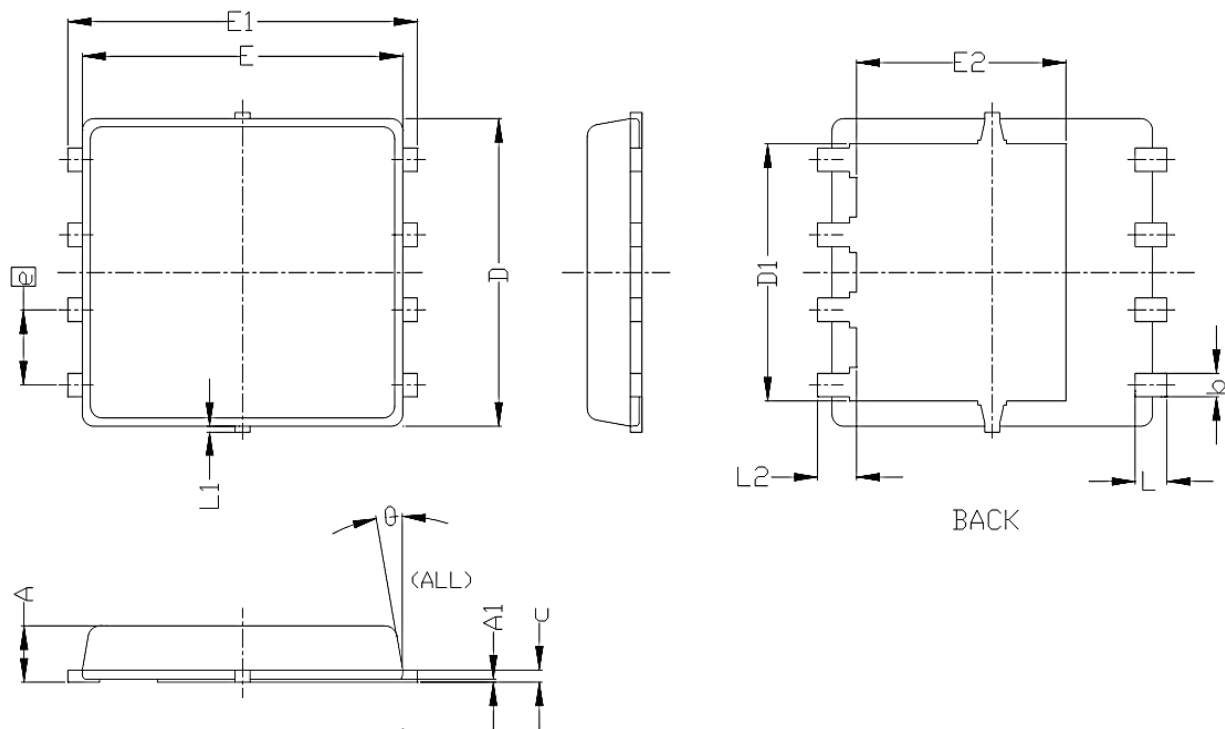


6. Capacitance

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°