N-Channel 200-V (D-S) MOSFET

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

Typical Applications:
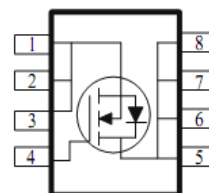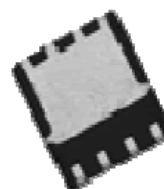- White LED boost converters
- PoE PD Power supplies
- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (mΩ)	I_D(A)
200	87 @ V_{GS} = 10V	6.2
	102 @ V_{GS} = 6.5V	5.8

DFN5X6-8L

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current [a]	T_A=25°C	I_D	6.2	A
	T_A=70°C		5	
Pulsed Drain Current [b]		I_{DM}	30	
Continuous Source Current (Diode Conduction) [a]		I_S	7.1	A
Power Dissipation [a]	T_A=25°C	P_D	5	W
	T_A=70°C		3.2	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient [a]	t <= 10 sec	$R_{\theta JA}$	25	°C/W
	Steady State		65	

Notes

a.   Surface Mounted on 1" x 1" FR4 Board.

b.   Pulse width limited by maximum junction temperature
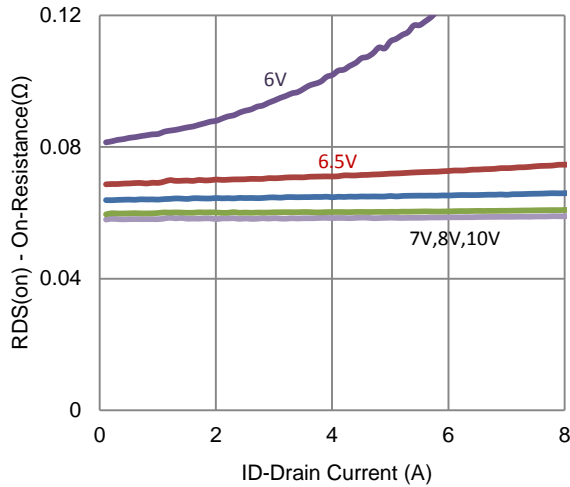
Electrical Characteristics

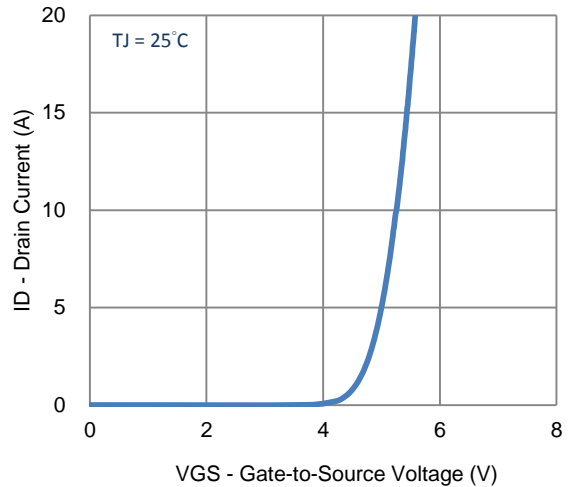| Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250$ uA	1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm20$ V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 160$ V, $V_{GS} = 0$ V			1	uA
		$V_{DS} = 160$ V, $V_{GS} = 0$ V, $T_J = 55°C$			25	
On-State Drain Current [a]	$I_{D(on)}$	$V_{DS} = 5$ V, $V_{GS} = 10$ V	10			A
Drain-Source On-Resistance [a]	$r_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 5.2$ A			87	mΩ
		$V_{GS} = 6$ V, $I_D = 4.2$ A			102	
Forward Transconductance [a]	g_{fs}	$V_{DS} = 15$ V, $I_D = 5.2$ A		30		S
Diode Forward Voltage [a]	V_{SD}	$I_S = 3.6$ A, $V_{GS} = 0$ V		0.75		V
Dynamic [b]						
Total Gate Charge	Q_g	$V_{DS} = 100$ V, $V_{GS} = 6.5$ V, $I_D = 5.2$ A		60		nC
Gate-Source Charge	Q_{gs}			20		
Gate-Drain Charge	Q_{gd}			34		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 100$ V, $R_L = 19.3$ Ω, $I_D = 5.2$ A, $V_{GEN} = 10$ V, $R_{GEN} = 6$ Ω		26		ns
Rise Time	t_r			28		
Turn-Off Delay Time	$t_{d(off)}$			98		
Fall Time	t_f			26		
Input Capacitance	C_{iss}	$V_{DS} = 15$ V, $V_{GS} = 0$ V, f = 1 MHz		4463		pF
Output Capacitance	C_{oss}			222		
Reverse Transfer Capacitance	C_{rss}			212		

Notes

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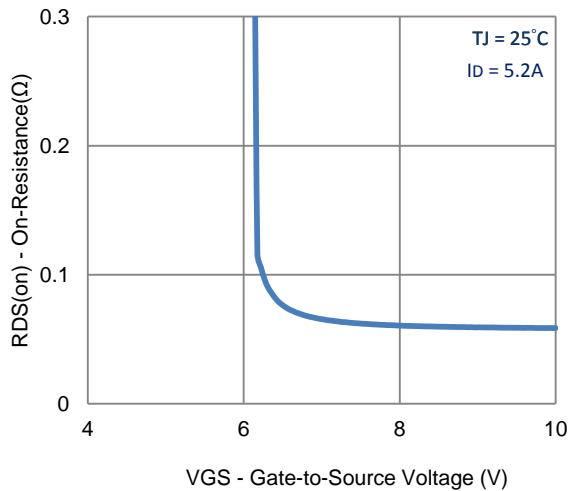b. Guaranteed by design, not subject to production testing.

Typical Electrical Characteristics
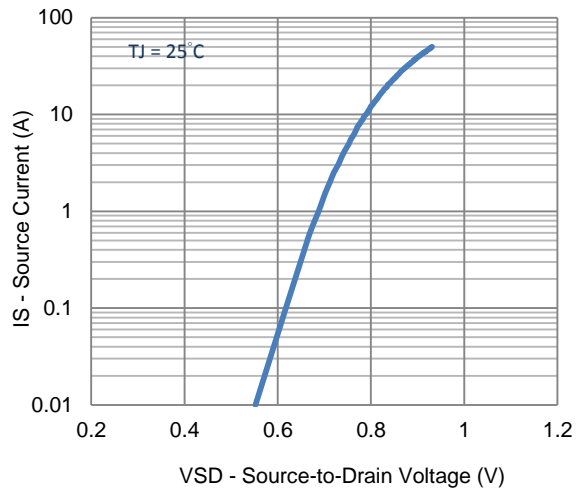

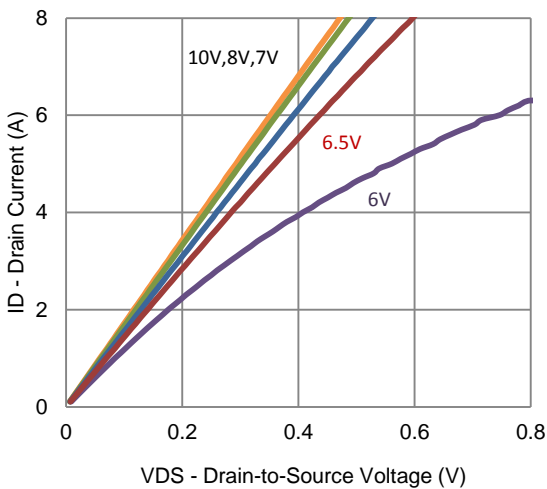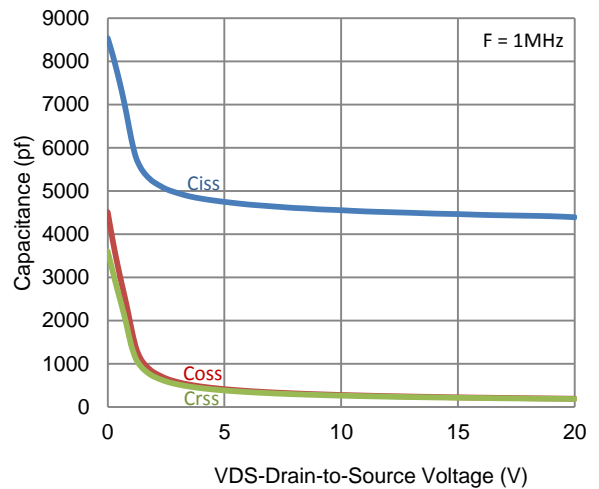**1. On-Resistance vs. Drain Current**

2. Transfer Characteristics

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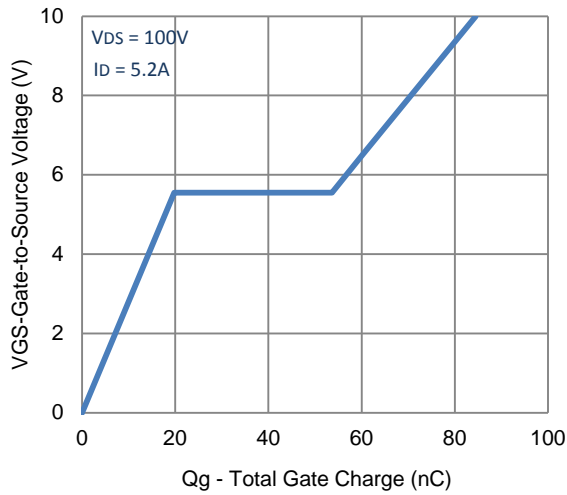

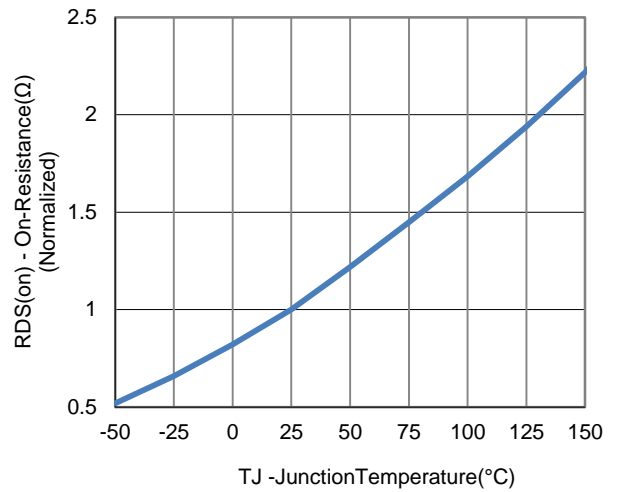**4. Drain-to-Source Forward Voltage**

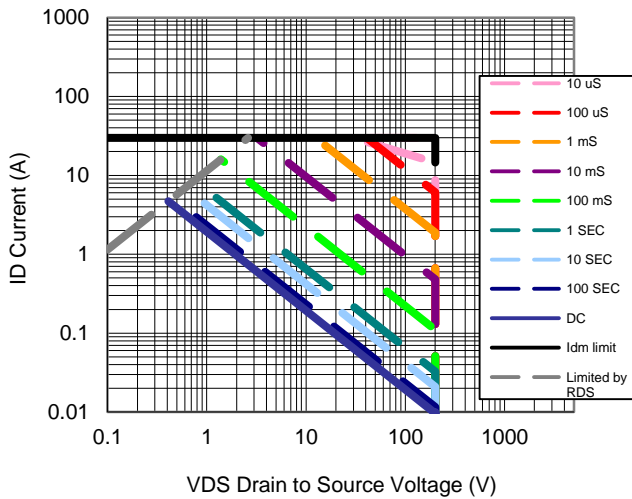**5. Output Characteristics**

6. Capacitance

Typical Electrical Characteristics

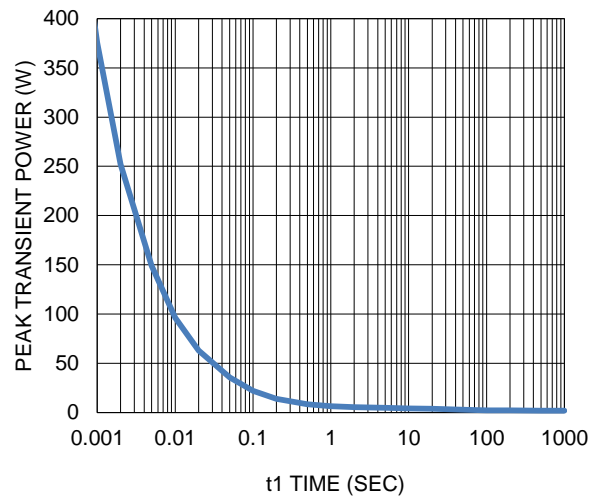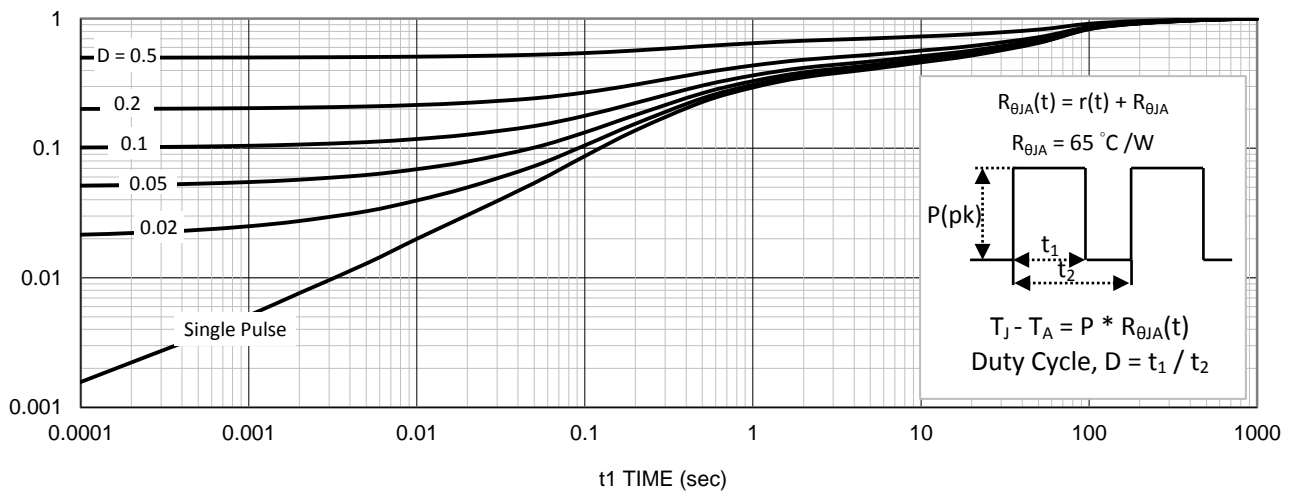**7. Gate Charge**

8. Normalized On-Resistance Vs Junction Temperature

9. Safe Operating Area

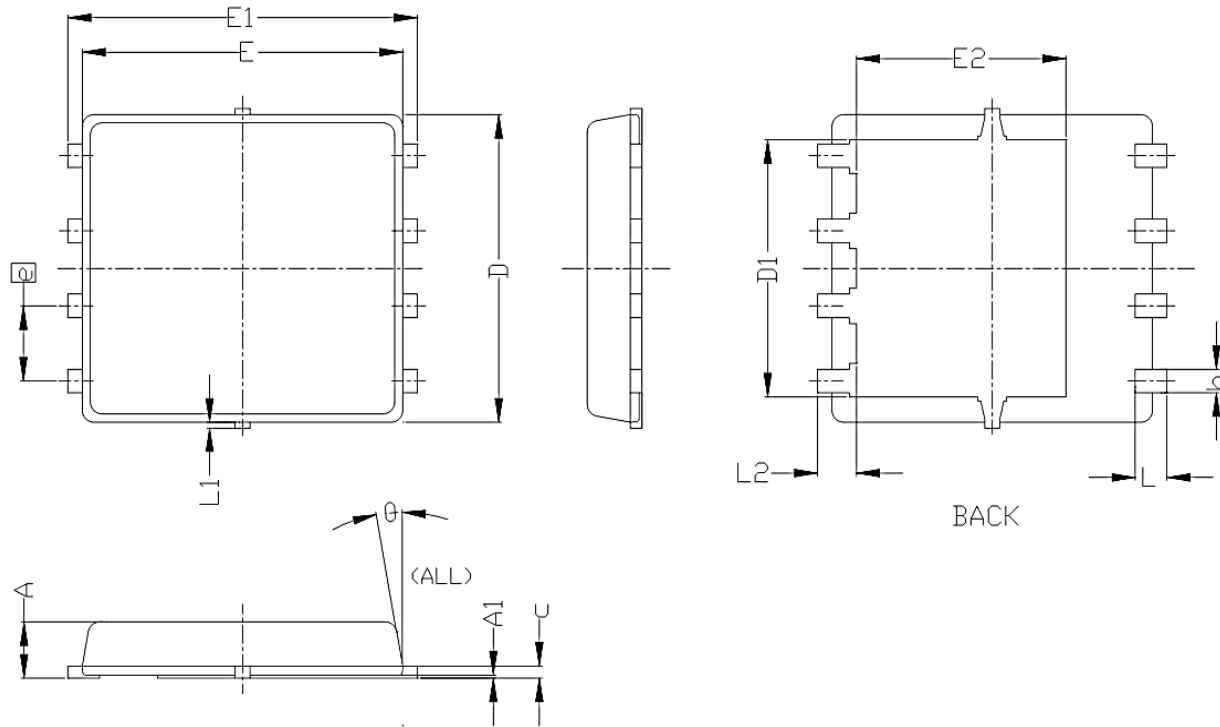**10. Single Pulse Maximum Power Dissipation**

$R_{\theta JA}(t) = r(t) + R_{\theta JA}$

$R_{\theta JA} = 65\ ^{\circ}C\ /W$

$T_J - T_A = P * R_{\theta JA}(t)$

Duty Cycle, $D = t_1 / t_2$

11. Normalized Thermal Transient Junction to Ambient

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°