

N & P-Channel 100-V (D-S) MOSFET

Key Features:

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

Typical Applications:

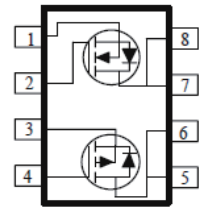
- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
100	62 @ $V_{GS} = 10V$	4.8
	72 @ $V_{GS} = 5.5V$	4.4
-100	275 @ $V_{GS} = -10V$	-2.5
	295 @ $V_{GS} = -4.5V$	-2.4



RoHS
COMPLIANT
HALOGEN
FREE

DFN5x6-8L



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	Nch Limit	Pch Limit	Units
Drain-Source Voltage		V_{DS}	100	-100	V
Gate-Source Voltage		V_{GS}	± 20	± 20	
Continuous Drain Current ^a	$T_A = 25^\circ\text{C}$	I_D	4.8	-2.5	A
	$T_A = 70^\circ\text{C}$		3.7	-2	
Pulsed Drain Current ^b		I_{DM}	20	-15	
Continuous Source Current (Diode Conduction) ^a		I_S	3	-2.7	A
Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	2.1	2.1	W
	$T_A = 70^\circ\text{C}$		1.3	1.3	
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	$t \leq 10 \text{ sec}$	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
	Steady State		110	

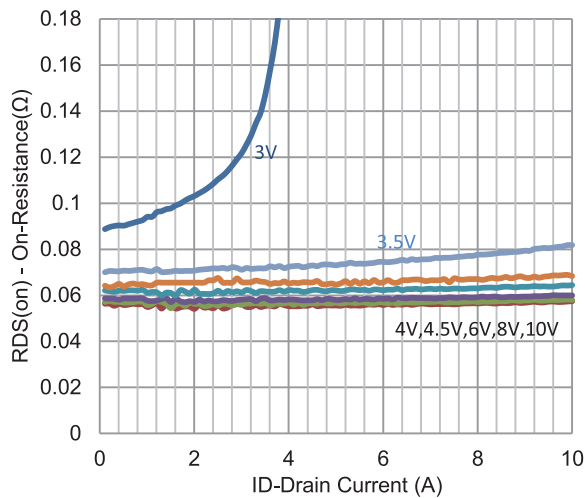
Notes

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

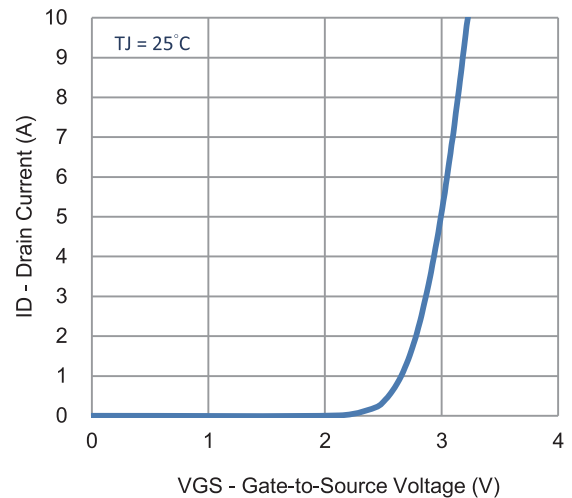
Electrical Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$ (N-ch)	1			V
		$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$ (P-ch)	-1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$ (N-ch)			1	μA
		$V_{DS} = -80\text{ V}, V_{GS} = 0\text{ V}$ (P-ch)			-1	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$ (N-ch)	2.4			A
		$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$ (P-ch)	-1.2			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 3.8\text{ A}$ (N-ch)			62	$\text{m}\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 3.7\text{ A}$ (N-ch)			72	
		$V_{GS} = -10\text{ V}, I_D = -2\text{ A}$ (P-ch)			275	$\text{m}\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -1.9\text{ A}$ (P-ch)			295	
Forward Transconductance	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 3.8\text{ A}$ (N-ch)		22		S
		$V_{DS} = -15\text{ V}, I_D = -2.0\text{ A}$ (P-ch)		20		S
Diode Forward Voltage	V_{SD}	$I_S = 1.5\text{ A}, V_{GS} = 0\text{ V}$ (N-ch)		0.7		V
		$I_S = -1.3\text{ A}, V_{GS} = 0\text{ V}$ (P-ch)		0.8		V
Dynamic						
Total Gate Charge	Q_g	N - Channel $V_{DS} = 50\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 3.8\text{ A}$		11		nC
Gate-Source Charge	Q_{gs}			3.6		
Gate-Drain Charge	Q_{gd}			6.1		
Total Gate Charge	Q_g	P - Channel $V_{DS} = -50\text{ V}, V_{GS} = 4.5\text{ V}, I_D = -2\text{ A}$		9		nC
Gate-Source Charge	Q_{gs}			3.7		
Gate-Drain Charge	Q_{gd}			4.0		
Turn-On Delay Time	$t_{d(on)}$	N - Channel $V_{DD} = 50\text{ V}, R_L = 13.2\text{ }\Omega, I_D = 3.8\text{ A},$ $V_{GEN} = 10\text{ V}, R_{GEN} = 6\text{ }\Omega$		10		ns
Rise Time	t_r			12		
Turn-Off Delay Time	$t_{d(off)}$			53		
Fall Time	t_f			21		
Turn-On Delay Time	$t_{d(on)}$	P - Channel $V_{DD} = -50\text{ V}, R_L = 25\text{ }\Omega, I_D = -2\text{ A},$ $V_{GEN} = -10\text{ V}, R_{GEN} = 6\text{ }\Omega$		6		ns
Rise Time	t_r			11		
Turn-Off Delay Time	$t_{d(off)}$			78		
Fall Time	t_f			51		
Input Capacitance	C_{iss}	N - Channel $V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1122		pF
Output Capacitance	C_{oss}			130		
Reverse Transfer Capacitance	C_{rss}			82		
Input Capacitance	C_{iss}	P - Channel $V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1222		pF
Output Capacitance	C_{oss}			128		
Reverse Transfer Capacitance	C_{rss}			63		

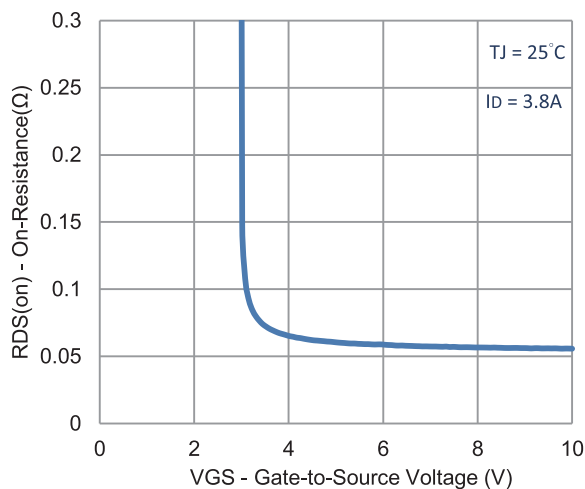
Typical Electrical Characteristics - N-channel



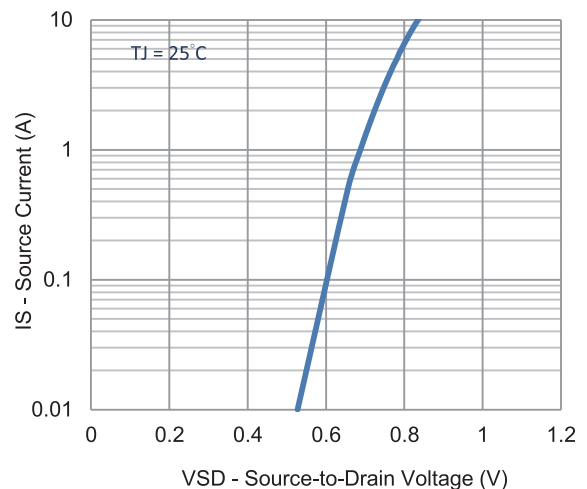
1. On-Resistance vs. Drain Current



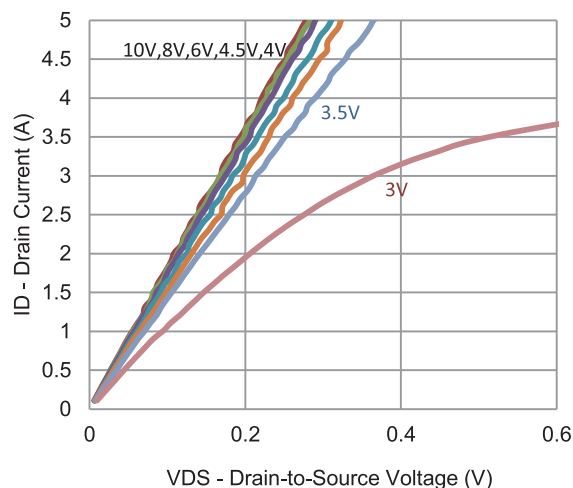
2. Transfer Characteristics



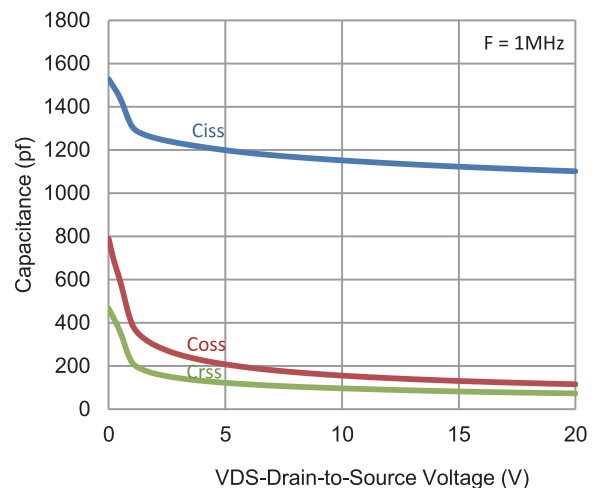
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

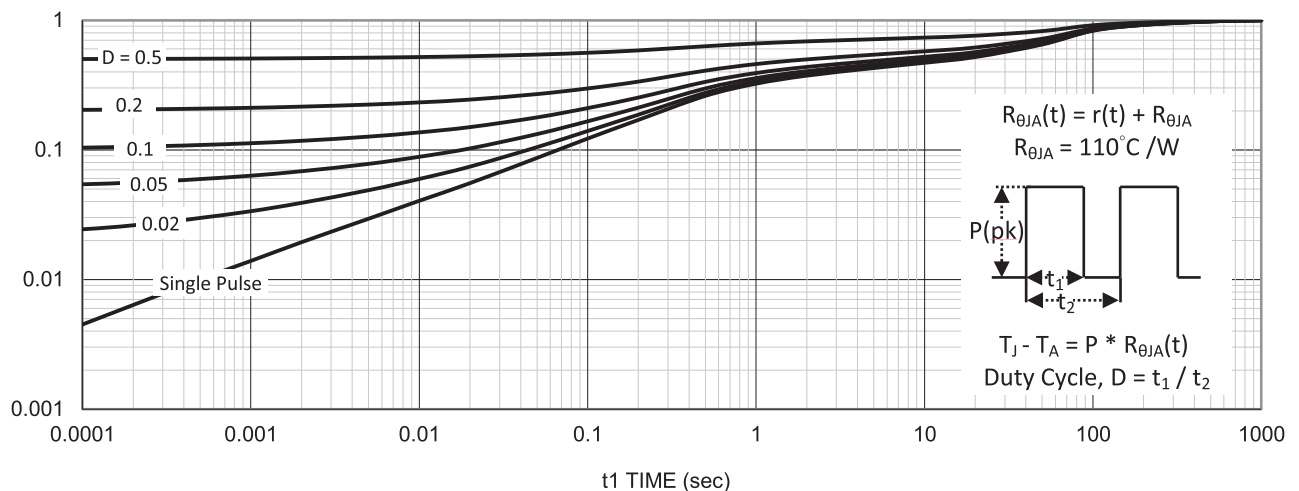
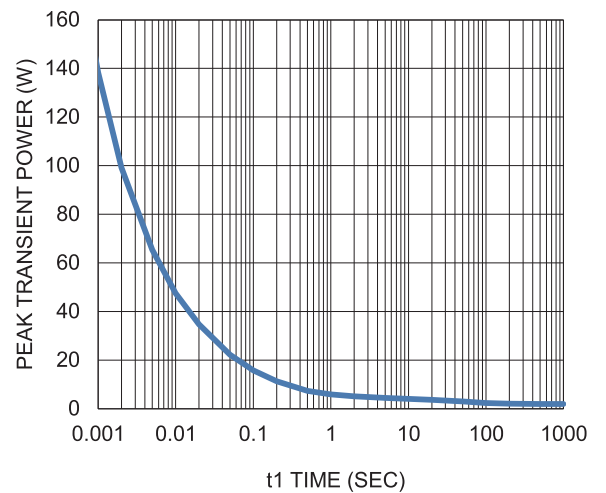
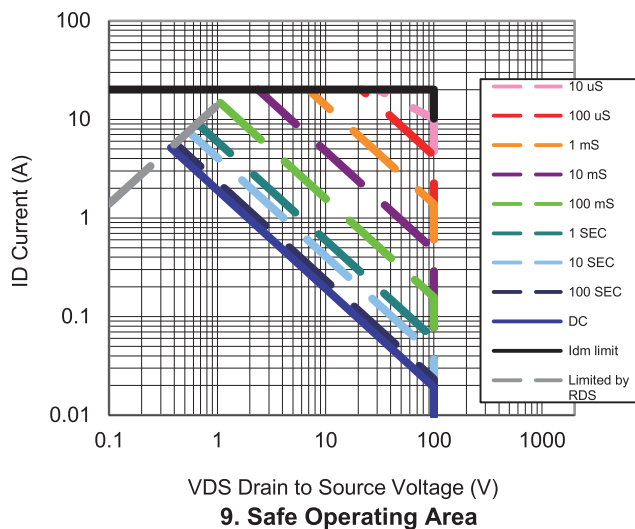
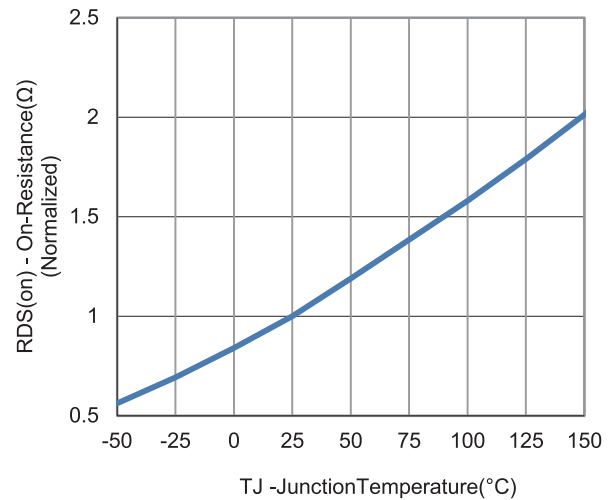
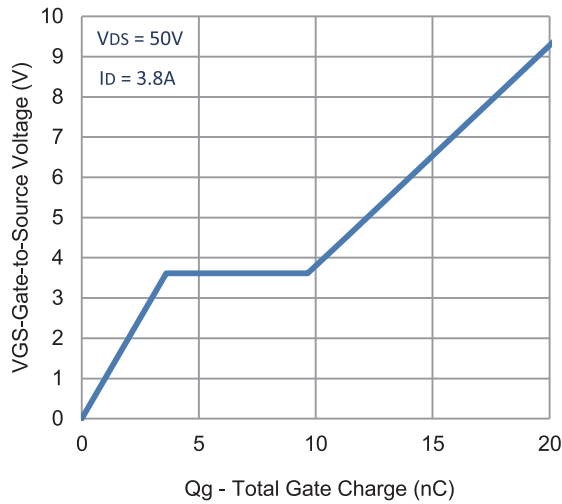


5. Output Characteristics

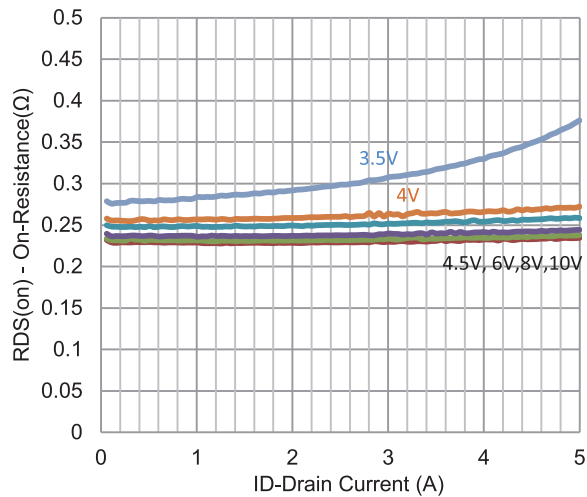


6. Capacitance

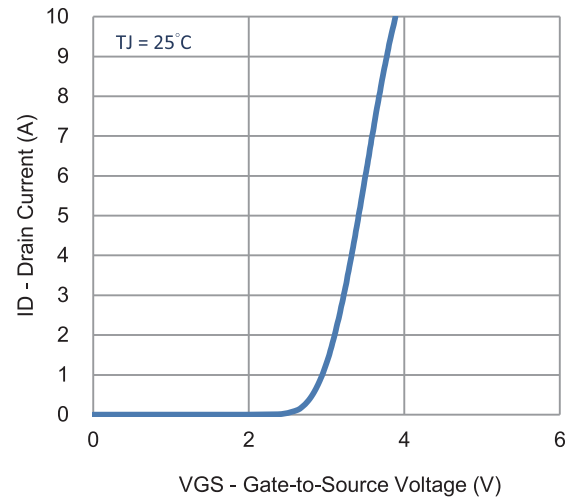
Typical Electrical Characteristics - N-channel



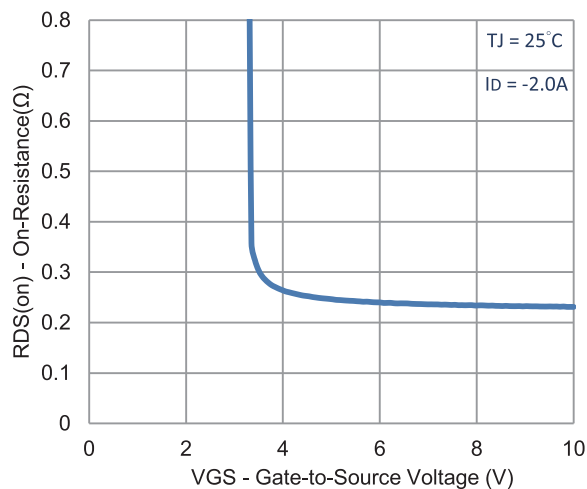
Typical Electrical Characteristics - P-channel



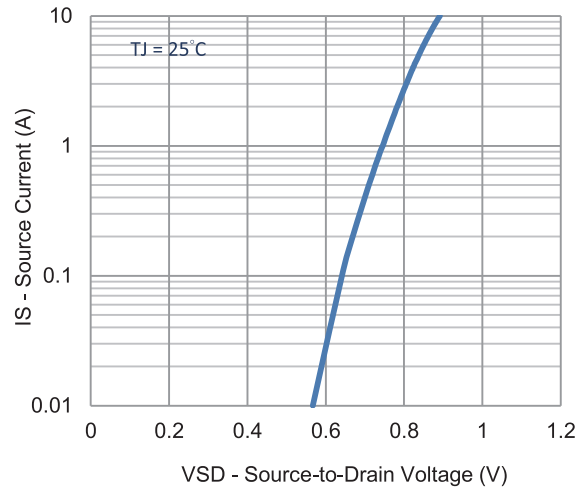
1. On-Resistance vs. Drain Current



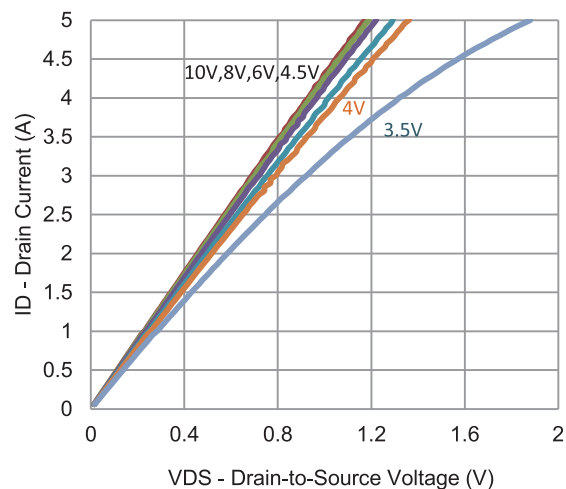
2. Transfer Characteristics



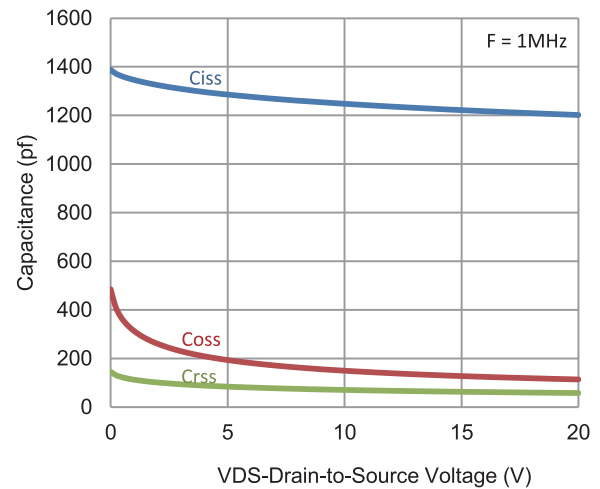
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

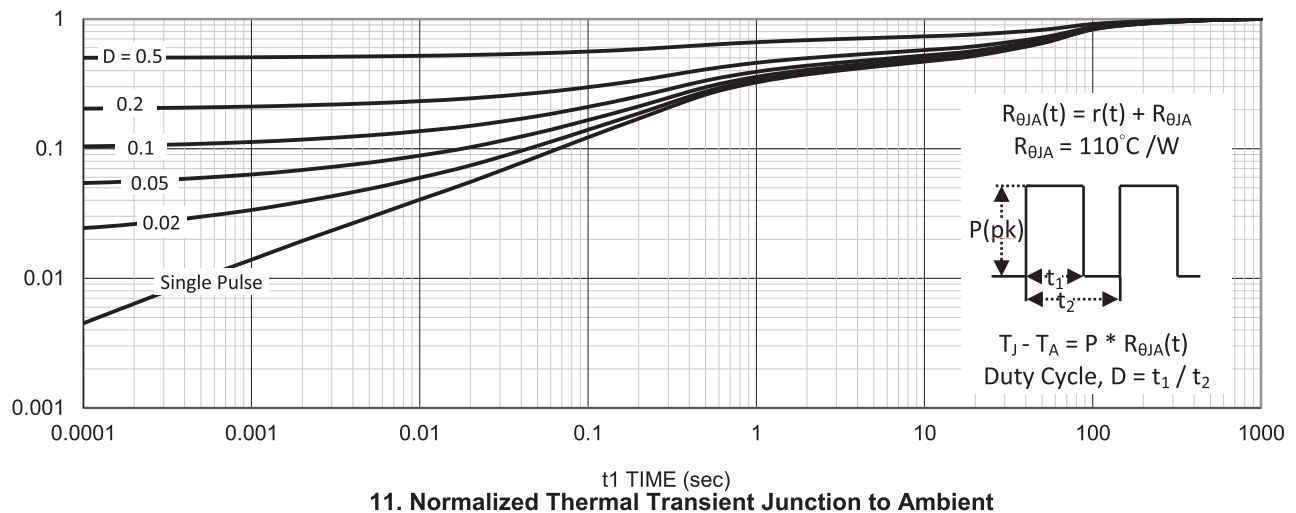
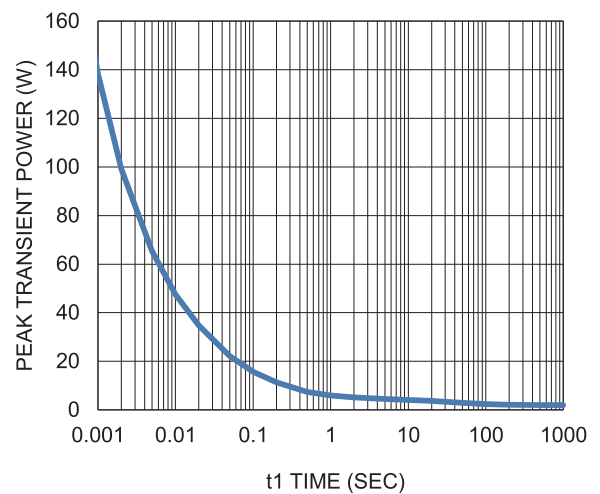
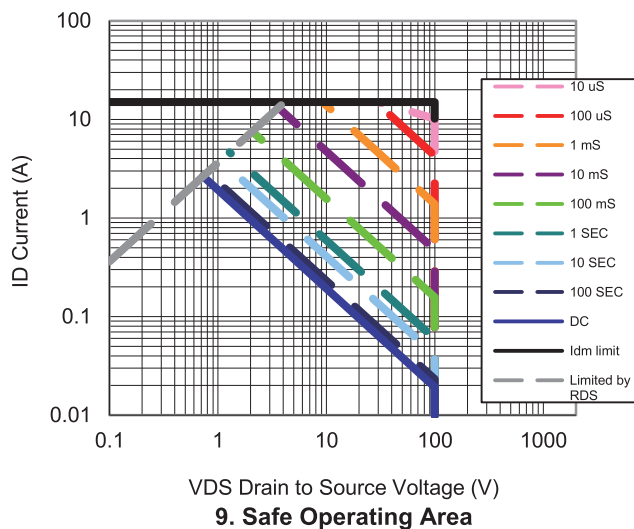
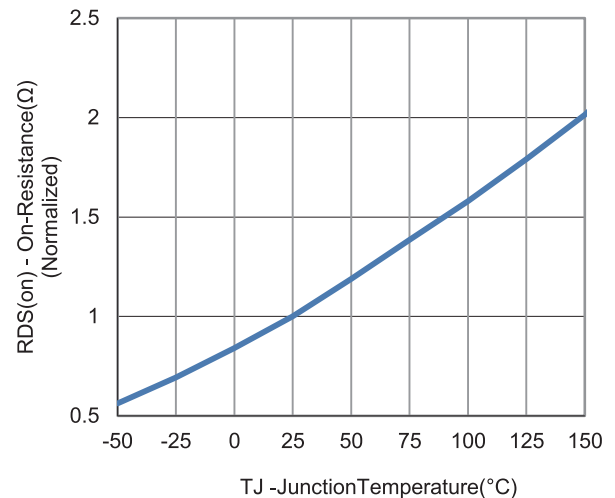
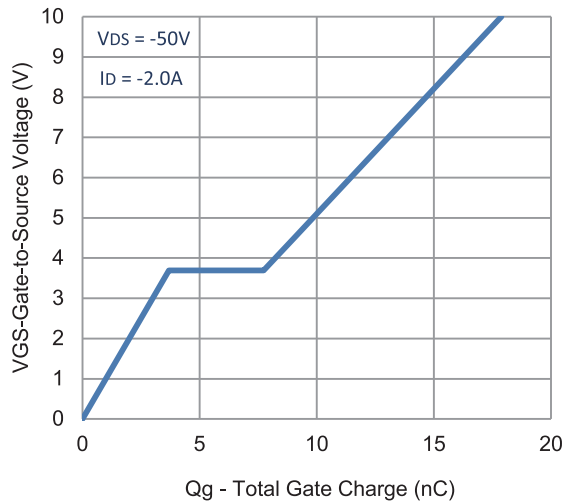


5. Output Characteristics

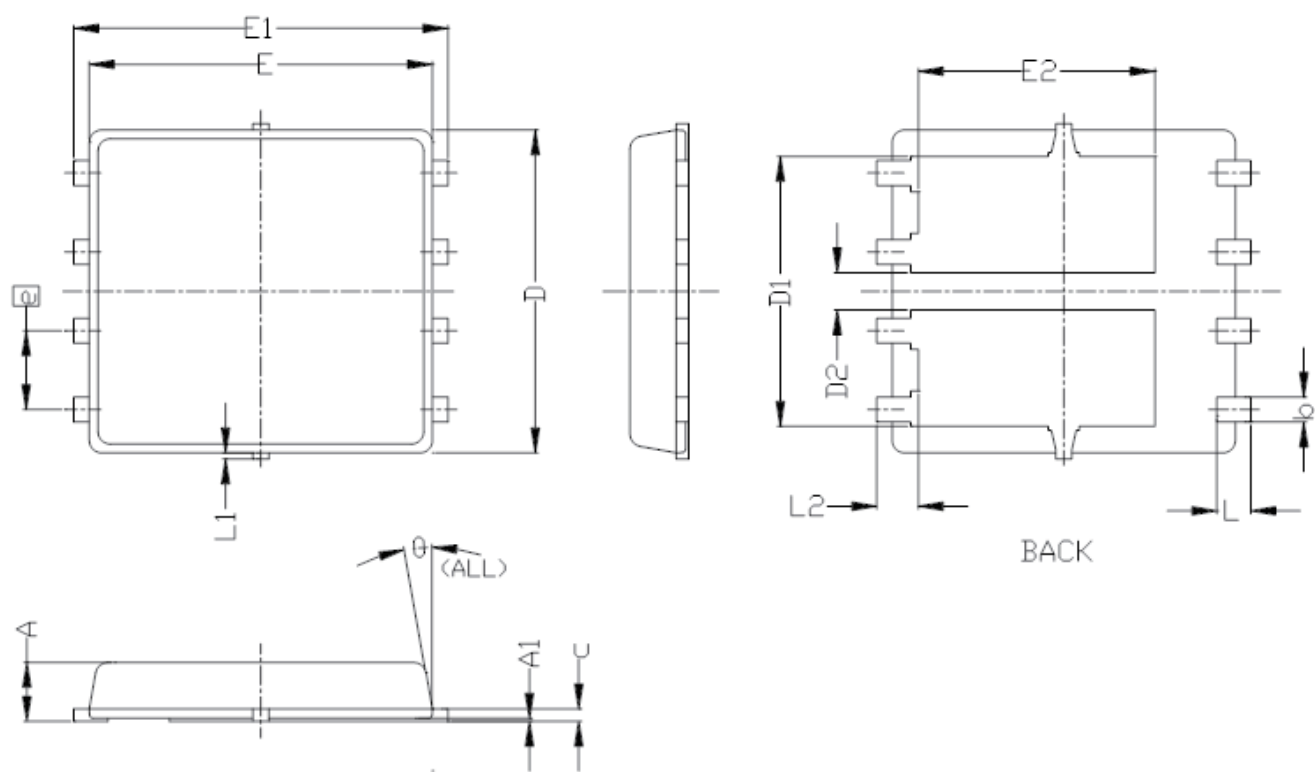


6. Capacitance

Typical Electrical Characteristics - P-channel



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		
D2	0.50	0.60	0.75	0.020	0.024	0.030
E	5.55 BSC			0.219 BSC		
E1	6.05 BSC			0.238 BSC		
E2	3.82 BSC			0.150 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°