

P & N-Channel 150-V (D-S)

Key Features:

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

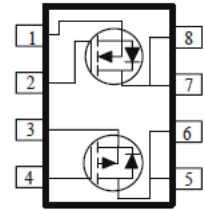
Typical Applications:

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



RoHS
COMPLIANT
HALOGEN
FREE

DFN5x6-8L



PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
150	255 @ $V_{GS} = 10V$	2.6
	290 @ $V_{GS} = 4.5V$	2.4
-150	500 @ $V_{GS} = -10V$	-1.8
	530 @ $V_{GS} = -4.5V$	-1.7

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

Parameter	Symbol	Nch Limit	Pch Limit	Units
Drain-Source Voltage	V_{DS}	150	-150	V
Gate-Source Voltage	V_{GS}	± 20	± 20	
Continuous Drain Current ^a	I_D	2.6	-1.8	A
		2	-1.5	
Pulsed Drain Current ^b	I_{DM}	10	-10	
Continuous Source Current (Diode Conduction) ^a	I_S	3	-3	A
Power Dissipation ^a	P_D	2.5	2.5	W
		1.6	1.6	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ C$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$R_{\theta JA}$	62.5	$^\circ C/W$
		110	

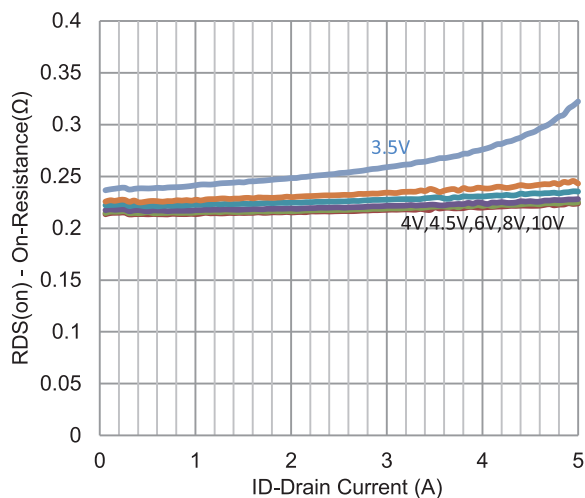
Notes

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

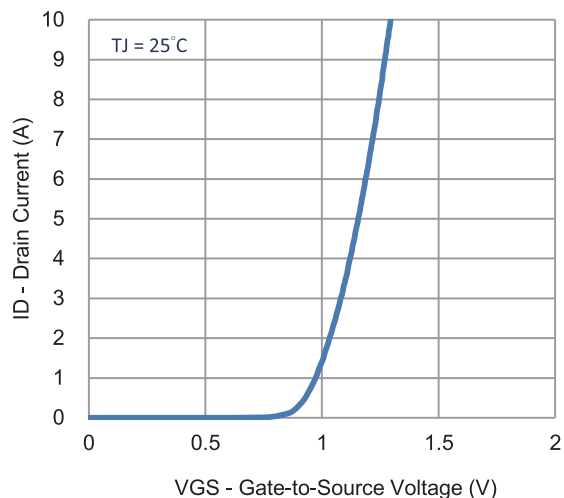
Electrical Characteristics

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}	$V_{DS} = 120 \text{ V}, V_{GS} = 0 \text{ V}$ (N-ch)			1	μA
		$V_{DS} = -120 \text{ V}, V_{GS} = 0 \text{ V}$ (P-ch)			-1	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$ (N-ch)	1.3			A
		$V_{DS} = -5 \text{ V}, V_{GS} = -10 \text{ V}$ (P-ch)	-0.9			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 2.1 \text{ A}$ (N-ch)			255	$\text{m}\Omega$
		$V_{GS} = 4.5 \text{ V}, I_D = 2.0 \text{ A}$ (N-ch)			290	
		$V_{GS} = -10 \text{ V}, I_D = -1.4 \text{ A}$ (P-ch)			500	$\text{m}\Omega$
		$V_{GS} = -4.5 \text{ V}, I_D = -1.3 \text{ A}$ (P-ch)			530	
Forward Transconductance	g_{fs}	$V_{DS} = 15 \text{ V}, I_D = 2.1 \text{ A}$ (N-ch)		11		S
		$V_{DS} = -15 \text{ V}, I_D = -1.4 \text{ A}$ (P-ch)		11		S
Diode Forward Voltage	V_{SD}	$I_S = 1.5 \text{ A}, V_{GS} = 0 \text{ V}$ (N-ch)		0.77		V
		$I_S = -1.5 \text{ A}, V_{GS} = 0 \text{ V}$ (P-ch)		0.77		V
Dynamic						
Total Gate Charge	Q_g	N - Channel $V_{DS} = 75 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 2.1 \text{ A}$		10		nC
Gate-Source Charge	Q_{gs}			4.0		
Gate-Drain Charge	Q_{gd}			4.7		
Total Gate Charge	Q_g	P - Channel $V_{DS} = -75 \text{ V}, V_{GS} = -4.5 \text{ V},$ $I_D = -1.4 \text{ A}$		6		nC
Gate-Source Charge	Q_{gs}			2.0		
Gate-Drain Charge	Q_{gd}			2.9		
Turn-On Delay Time	$t_{d(on)}$	N - Channel $V_{DD} = 75 \text{ V}, R_L = 35.7 \text{ }\Omega, I_D = 2.1 \text{ A},$ $V_{GEN} = 10 \text{ V}, R_{GEN} = 6 \text{ }\Omega$		7		ns
Rise Time	t_r			7		
Turn-Off Delay Time	$t_{d(off)}$			47		
Fall Time	t_f			20		
Turn-On Delay Time	$t_{d(on)}$	P - Channel $V_{DD} = -75 \text{ V}, R_L = 53.6 \text{ }\Omega,$ $I_D = -1.4 \text{ A},$ $V_{GEN} = -10 \text{ V}, R_{GEN} = 6 \text{ }\Omega$		8		ns
Rise Time	t_r			7		
Turn-Off Delay Time	$t_{d(off)}$			96		
Fall Time	t_f			79		
Input Capacitance	C_{iss}	N - Channel $V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		1016		pF
Output Capacitance	C_{oss}			83		
Reverse Transfer Capacitance	C_{rss}			40		
Input Capacitance	C_{iss}	P - Channel $V_{DS} = -15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		1008		pF
Output Capacitance	C_{oss}			100		
Reverse Transfer Capacitance	C_{rss}			61		

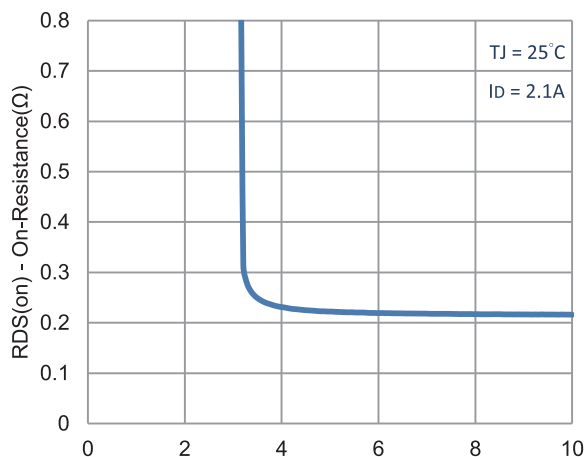
Typical Electrical Characteristics - N-channel



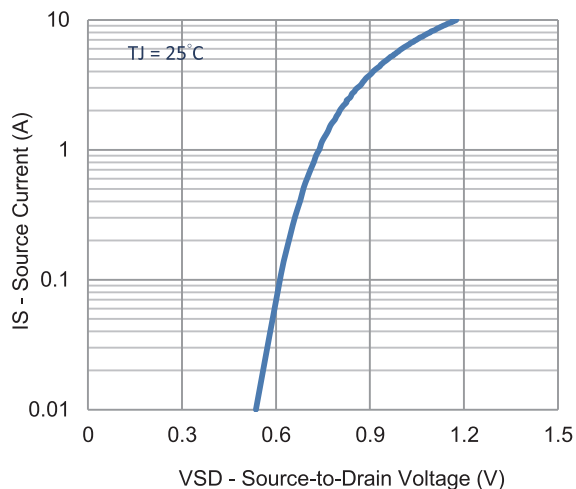
1. On-Resistance vs. Drain Current



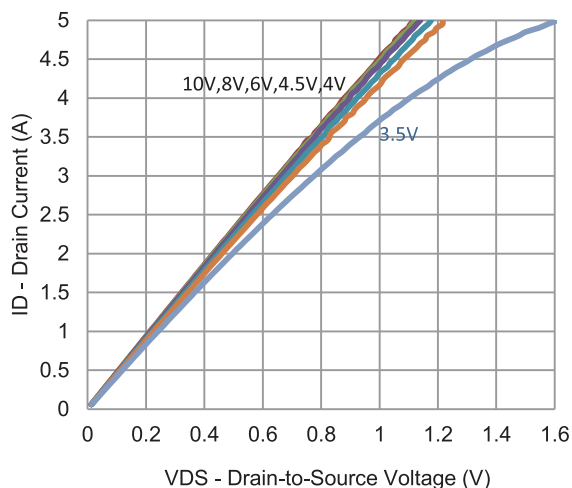
2. Transfer Characteristics



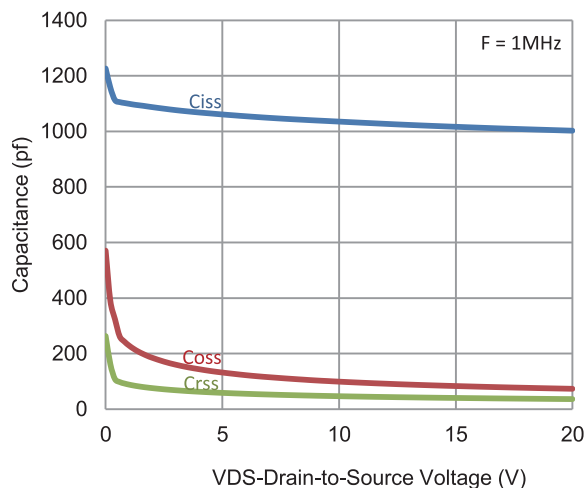
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

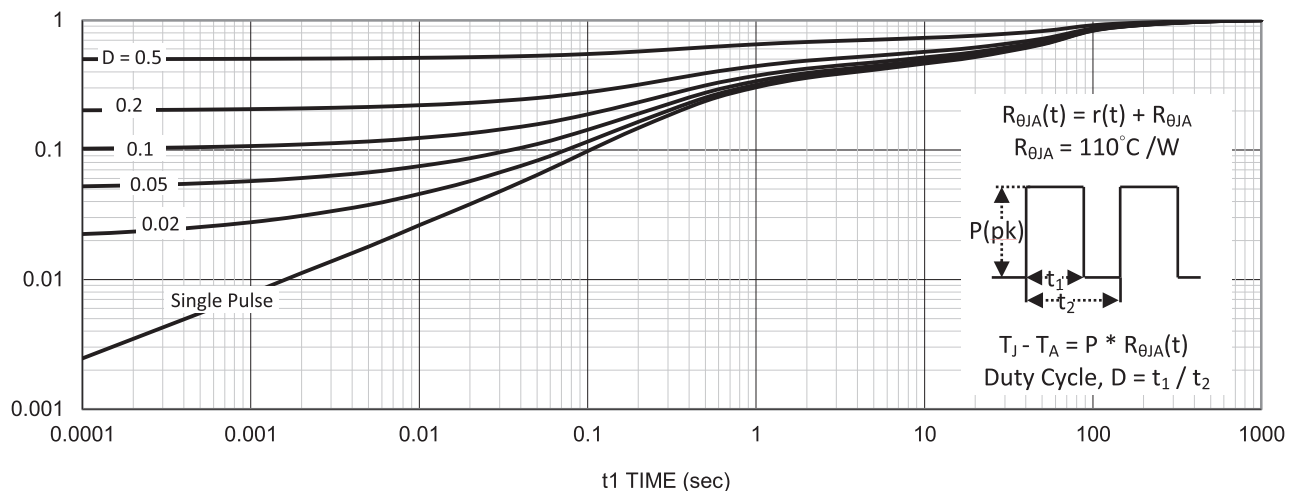
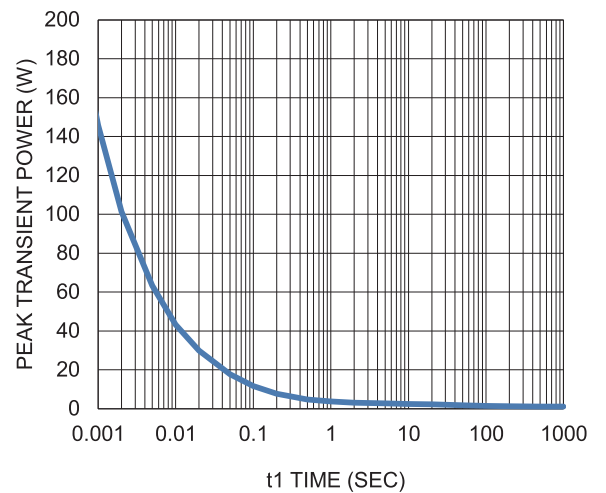
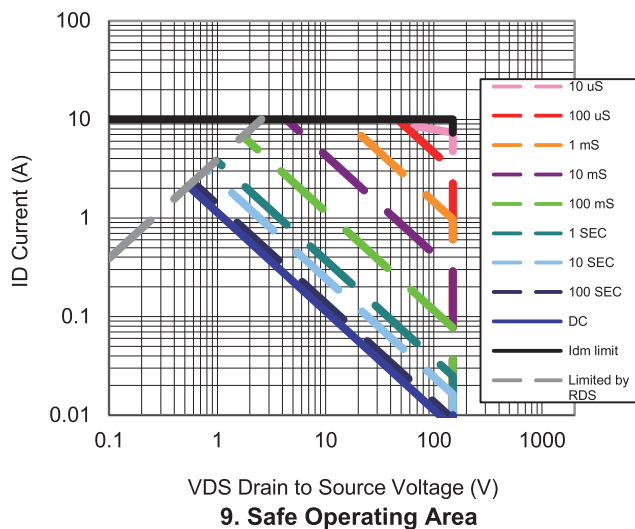
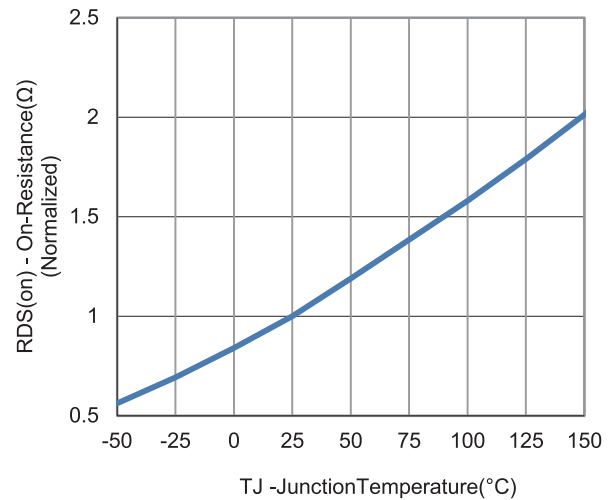
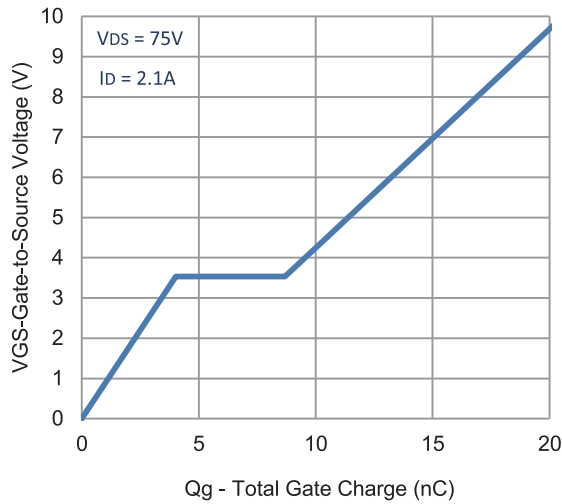


5. Output Characteristics

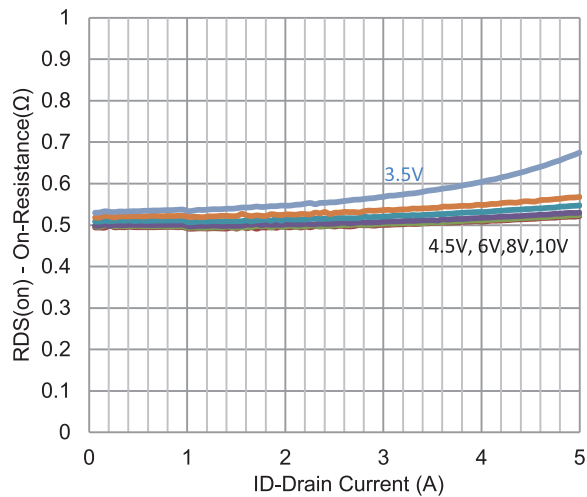


6. Capacitance

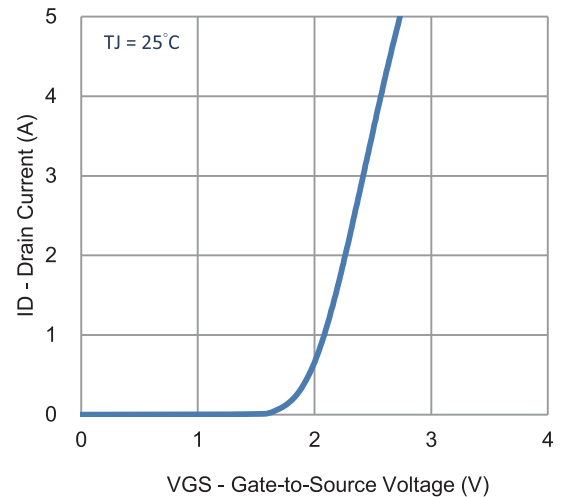
Typical Electrical Characteristics - N-channel



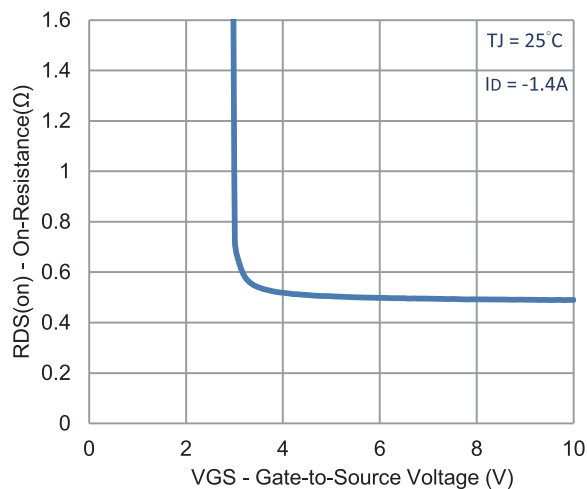
Typical Electrical Characteristics - P-channel



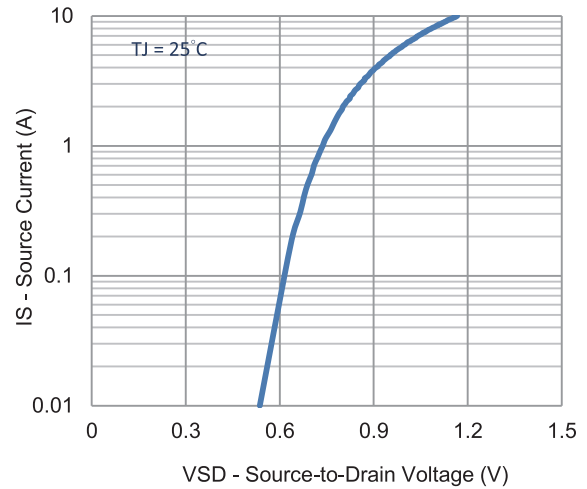
1. On-Resistance vs. Drain Current



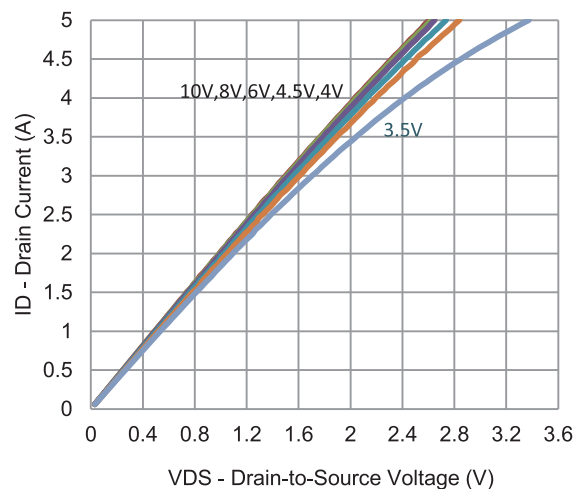
2. Transfer Characteristics



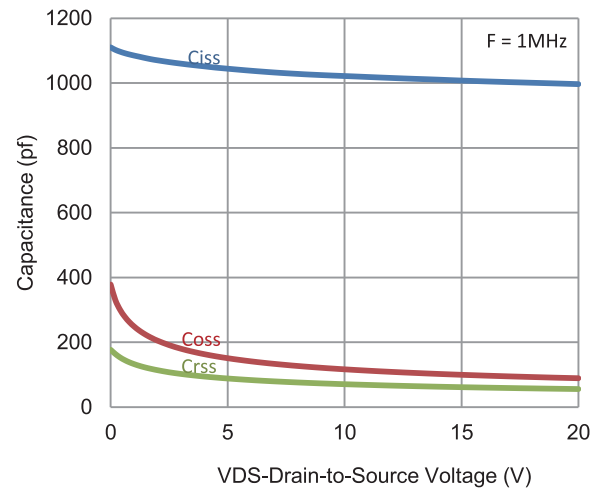
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

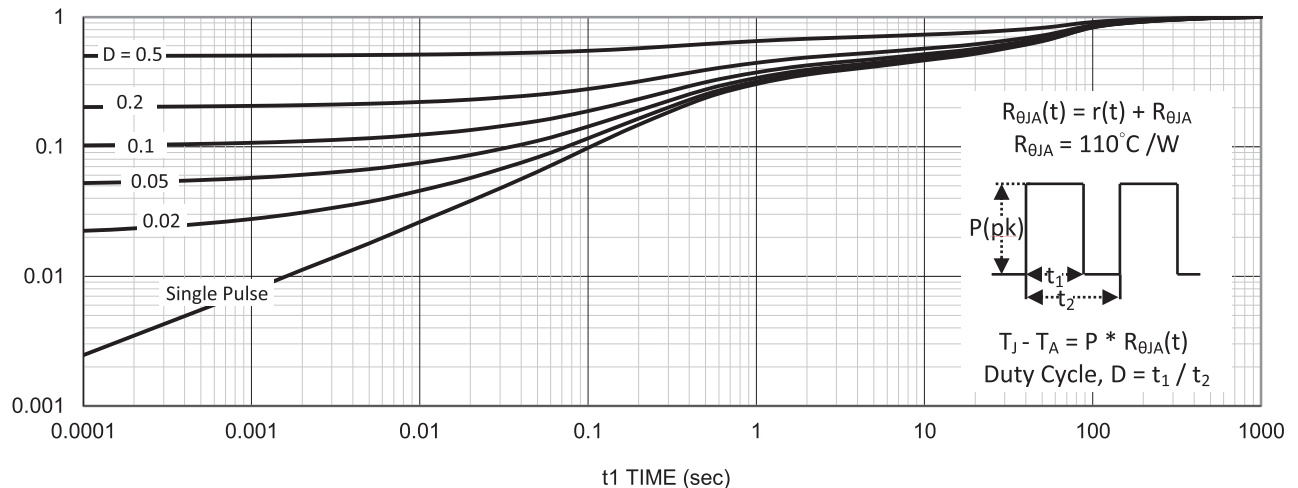
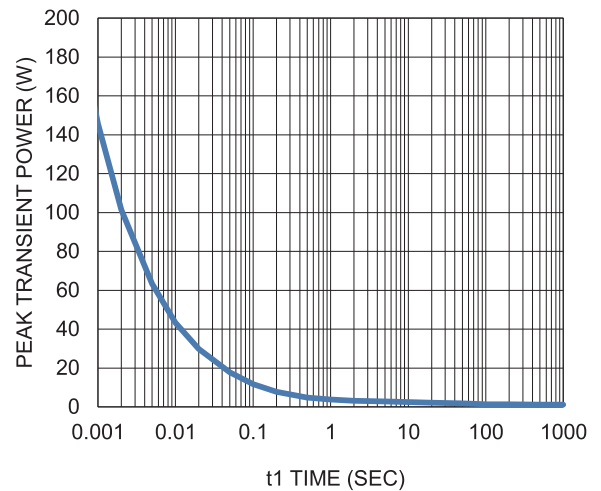
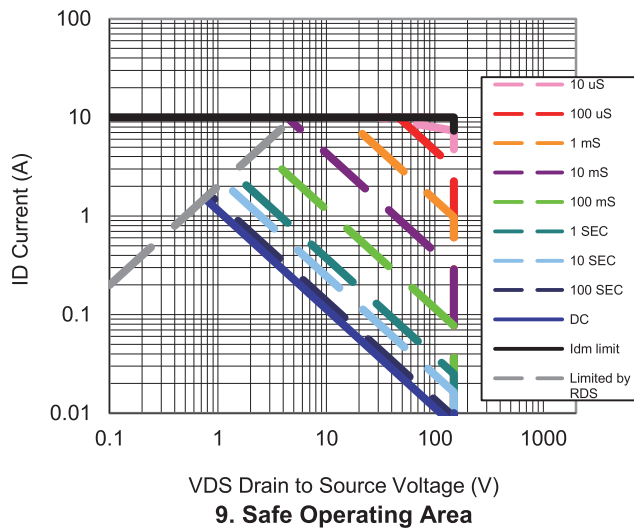
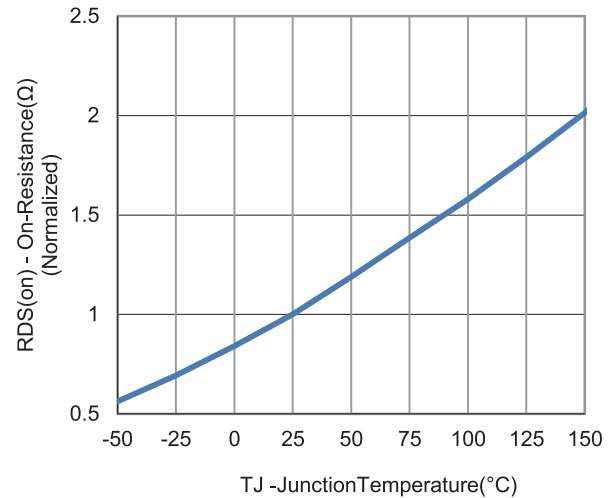
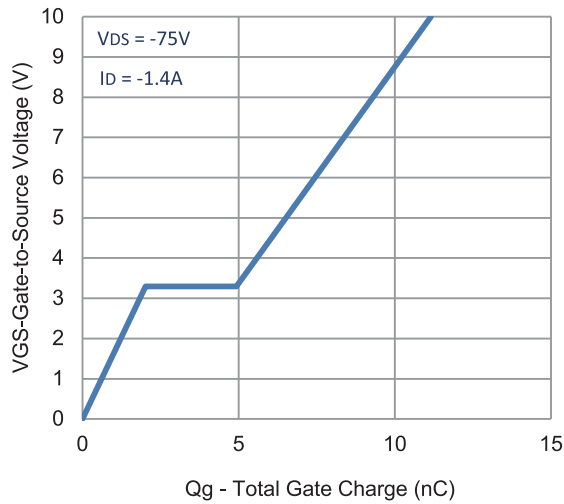


5. Output Characteristics

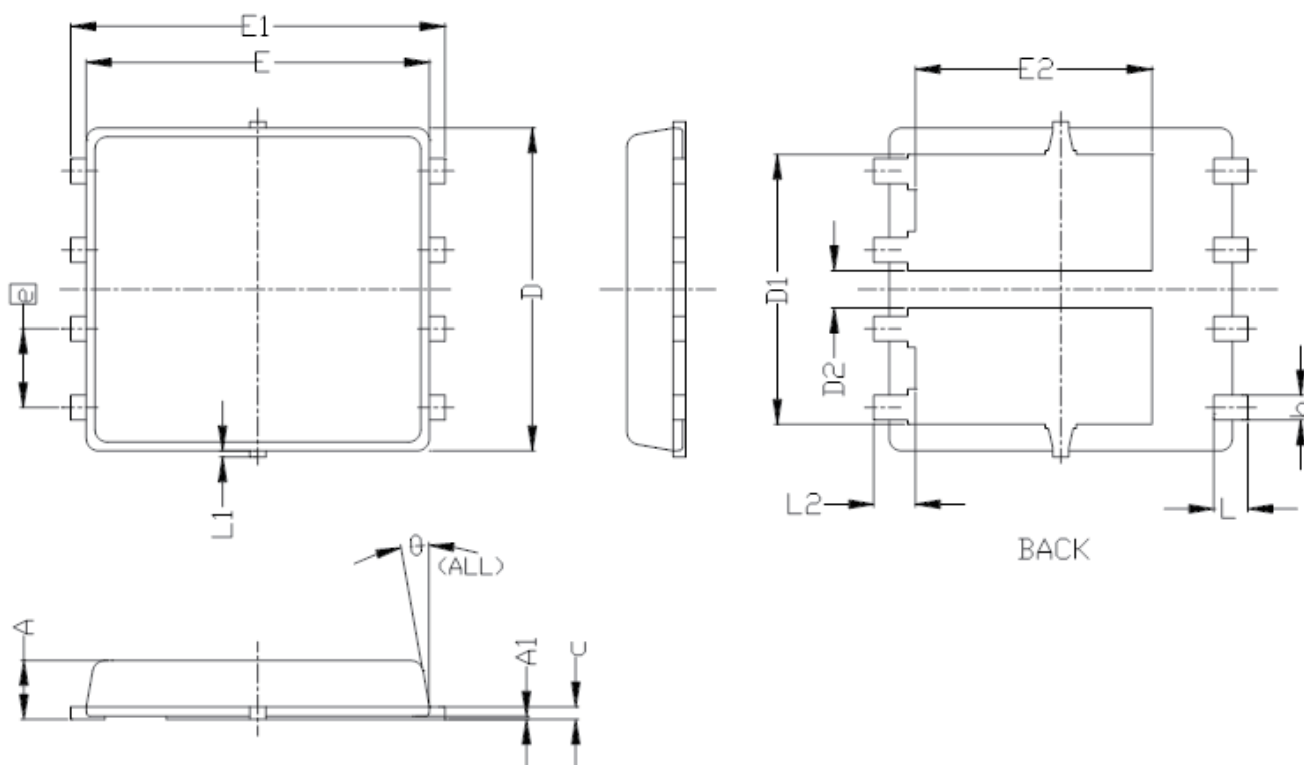


6. Capacitance

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°