

## P-Channel 30-V (D-S) MOSFET

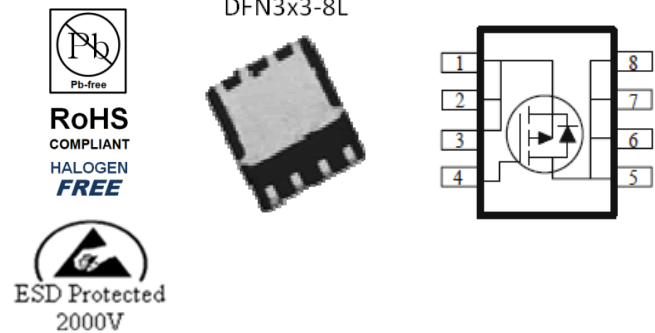
### Key Features:

- 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 $\Omega$ )	$I_D$ (A)
-30	20 @ $V_{GS} = -10V$	-10.9
	36 @ $V_{GS} = -4.5V$	-8.1



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		$V_{DS}$	-30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_A = 25^\circ\text{C}$	$I_D$	-10.9	A
	$T_A = 70^\circ\text{C}$		-8.2	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	-50	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	-4.5	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	$P_D$	3.5	W
	$T_A = 70^\circ\text{C}$		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 <sup>a</sup>	$t \leq 10 \text{ sec}$	$R_{\theta JA}$	35	$^\circ\text{C/W}$
	Steady State		81	

### Notes

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

## Electrical Characteristics

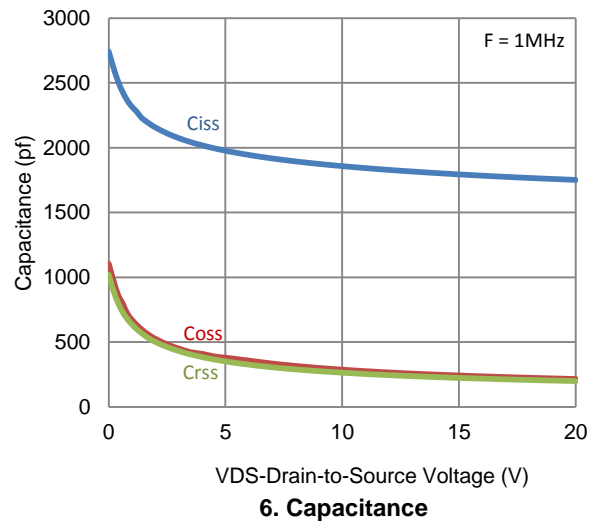
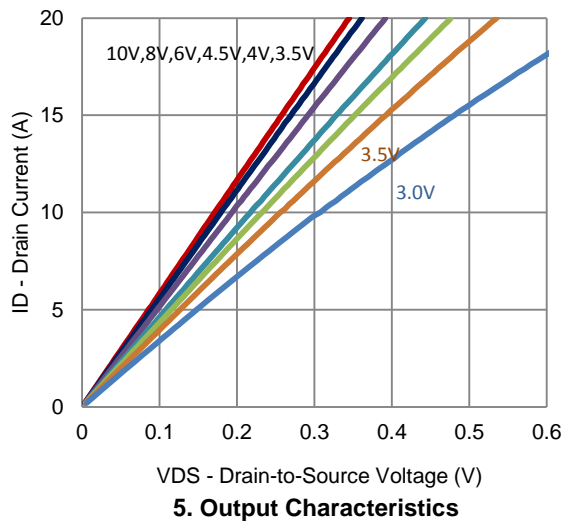
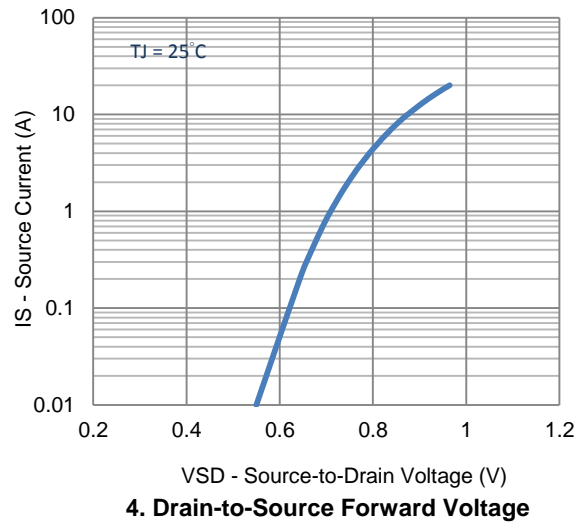
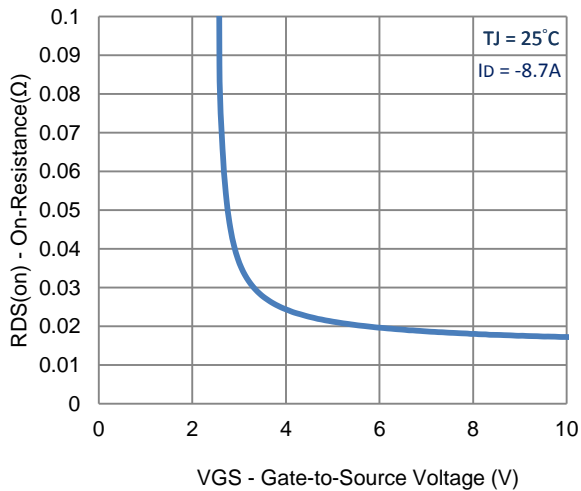
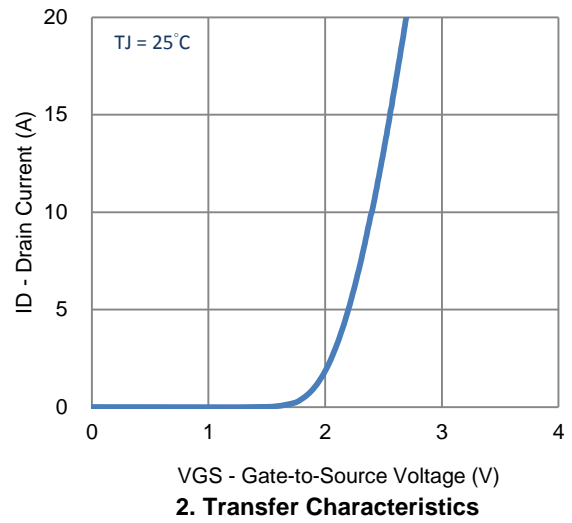
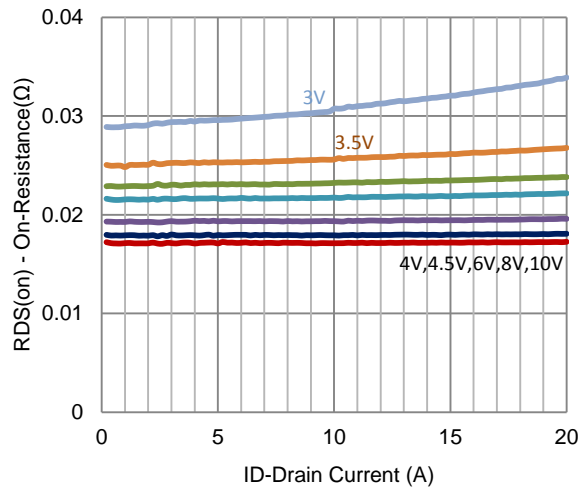
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -24 V, V_{GS} = 0 V$			-1	$\mu A$
		$V_{DS} = -24 V, V_{GS} = 0 V, T_J = 55^\circ C$			-25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -10 V$	-15			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = -10 V, I_D = -8.7 A$			20	m $\Omega$
		$V_{GS} = -4.5 V, I_D = -7 A$			36	
Forward Transconductance	$g_{fs}$	$V_{DS} = -15 V, I_D = -8.7 A$		20		S
Diode Forward Voltage	$V_{SD}$	$I_S = -2.3 A, V_{GS} = 0 V$		-0.76		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = -15 V, V_{GS} = -4.5 V,$ $I_D = -8.7 A$		22		nC
Gate-Source Charge	$Q_{gs}$			6.5		
Gate-Drain Charge	$Q_{gd}$			9.8		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -15 V, R_L = 1.8 \Omega,$ $I_D = -8.7 A,$ $V_{GEN} = -10 V, R_{GEN} = 6 \Omega$		8		ns
Rise Time	$t_r$			35		
Turn-Off Delay Time	$t_{d(off)}$			85		
Fall Time	$t_f$			51		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		1794		pF
Output Capacitance	$C_{oss}$			242		
Reverse Transfer Capacitance	$C_{rss}$			224		

## Notes

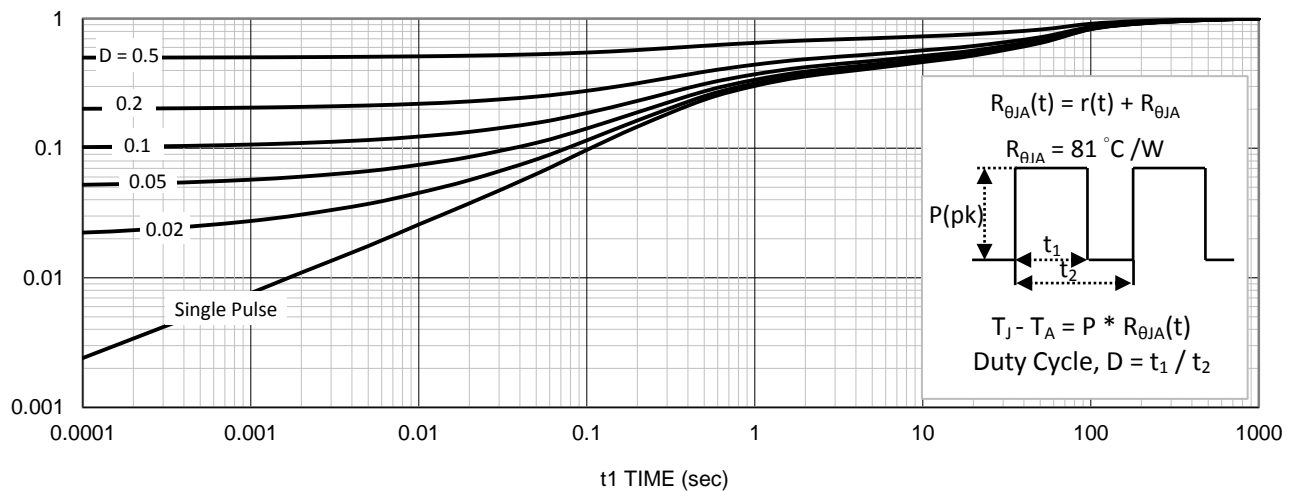
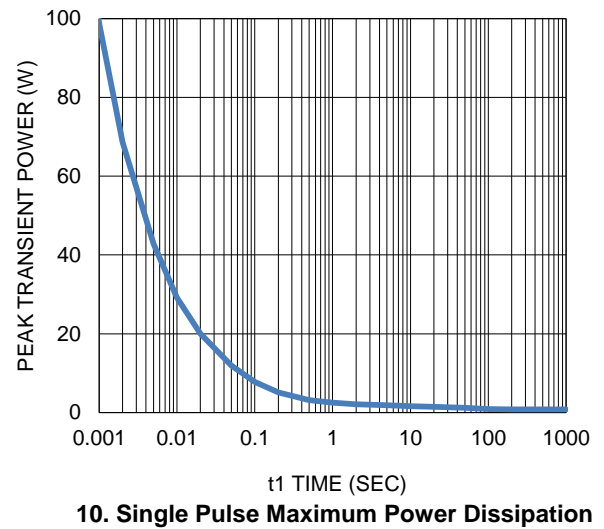
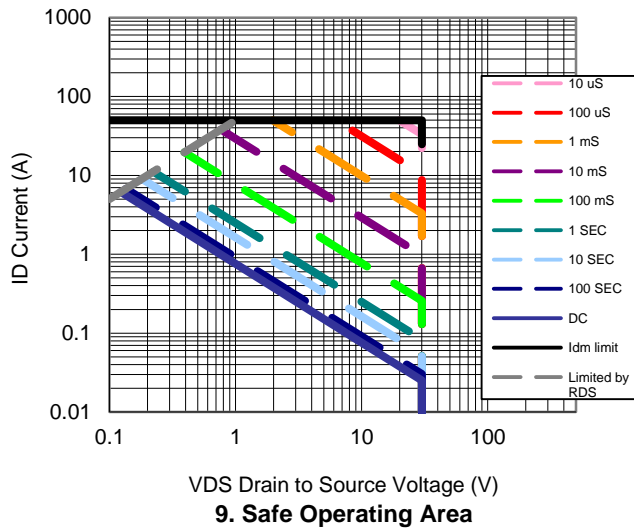
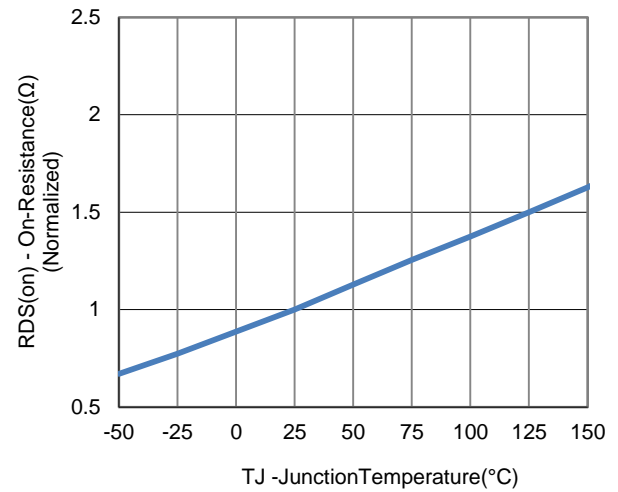
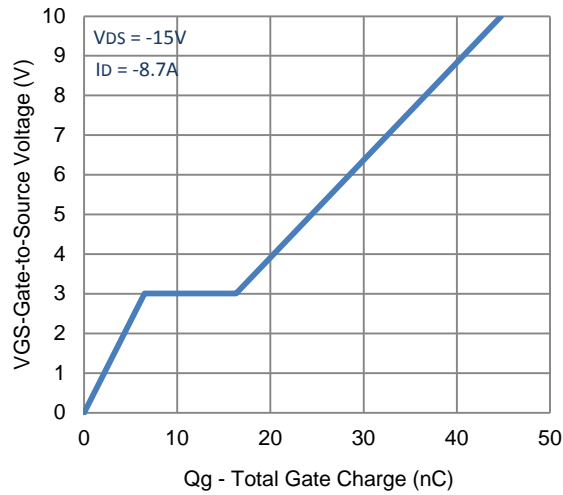
- Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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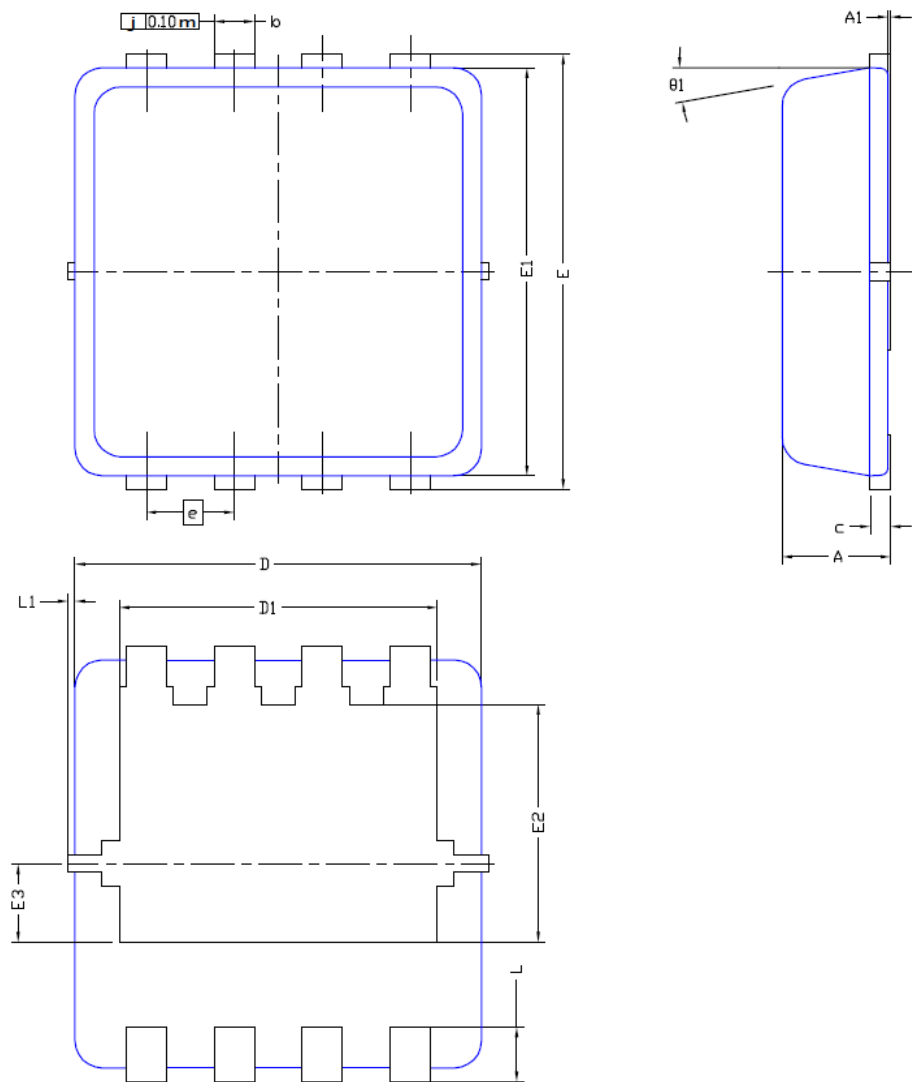
## Typical Electrical Characteristics



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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	0,10	0,152	0,25	0,004	0,006	0,010
D	3,00 BSC			0,118 BSC		
D1	2,35 BSC			0,093 BSC		
E	3,20 BSC			0,126 BSC		
E1	3,00 BSC			0,118 BSC		
E2	1,75 BSC			0,069 BSC		
E3	0,575 BSC			0,023 BSC		
e	0,65 BSC			0,026 BSC		
L	0,30	0,40	0,50	0,0118	0,0157	0,0197
L1	0	---	0,100	0	---	0,004
θ1	0°	10°	12°	0°	10°	12°