

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

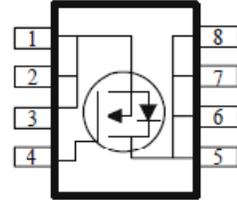
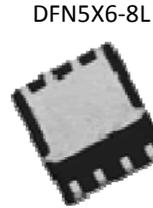
### Key Features:

- 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	4.6 @ $V_{GS} = 10V$	24
	5.5 @ $V_{GS} = 4.5V$	23



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>	$T_A = 25^\circ\text{C}$	$I_D$	24	A
	$T_A = 70^\circ\text{C}$		19	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	100	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	8.1	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	$P_D$	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 <sup>a</sup>	$t \leq 10$ sec	$R_{\theta JA}$	25	$^\circ\text{C}/\text{W}$
	Steady State		65	

### Notes

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

## Electrical Characteristics

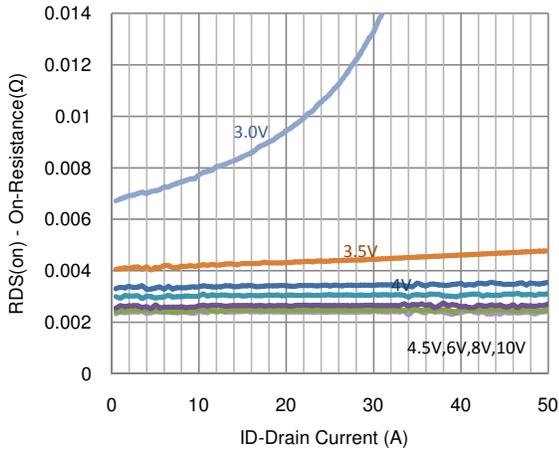
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24 V, V_{GS} = 0 V$			1	$\mu A$
		$V_{DS} = 24 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 10 V$	50			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 V, I_D = 19.2 A$			4.6	m $\Omega$
		$V_{GS} = V, I_D = 18.4 A$			5.5	
Forward Transconductance	$g_{fs}$	$V_{DS} = 15 V, I_D = 19.2 A$		35		S
Diode Forward Voltage	$V_{SD}$	$I_S = 4.1 A, V_{GS} = 0 V$		0.7		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15 V, V_{GS} = 4.5 V, I_D = 19.2 A$		67		nC
Gate-Source Charge	$Q_{gs}$			20		
Gate-Drain Charge	$Q_{gd}$			31		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 15 V, R_L = 0.8 \Omega, I_D = 19.2 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$		22		ns
Rise Time	$t_r$			41		
Turn-Off Delay Time	$t_{d(off)}$			192		
Fall Time	$t_f$			97		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		6813		pF
Output Capacitance	$C_{oss}$			1166		
Reverse Transfer Capacitance	$C_{rss}$			766		

## Notes

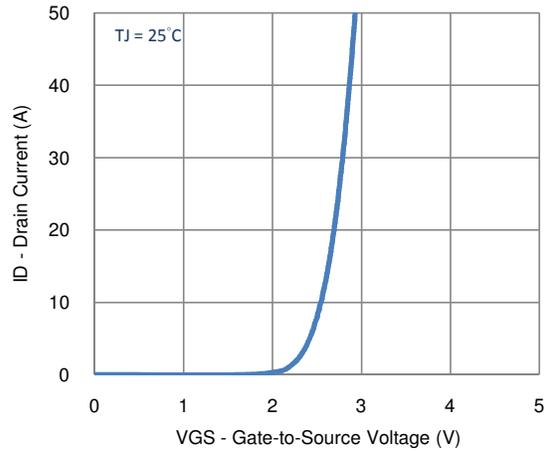
- Pulse test: PW  $\leq$  300 $\mu$ s duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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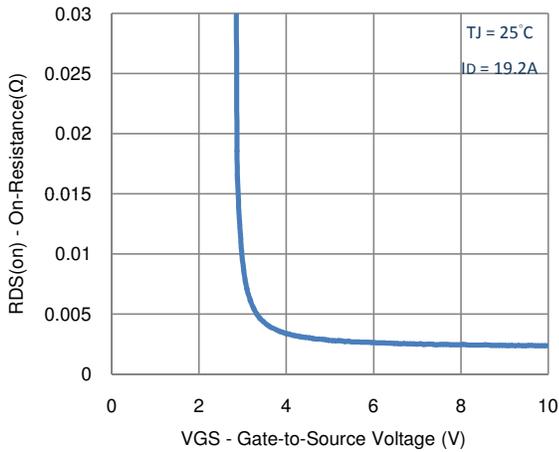
Typical Electrical Characteristics



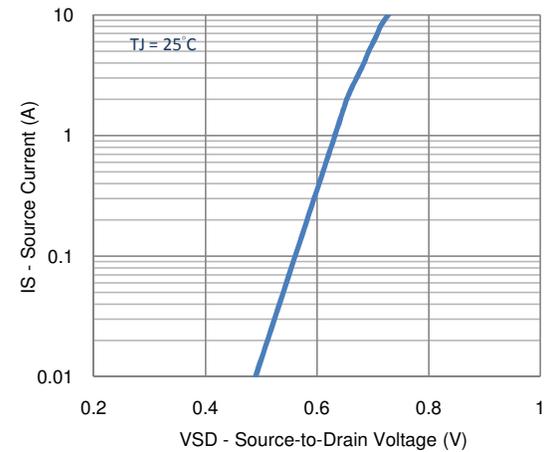
1. On-Resistance vs. Drain Current



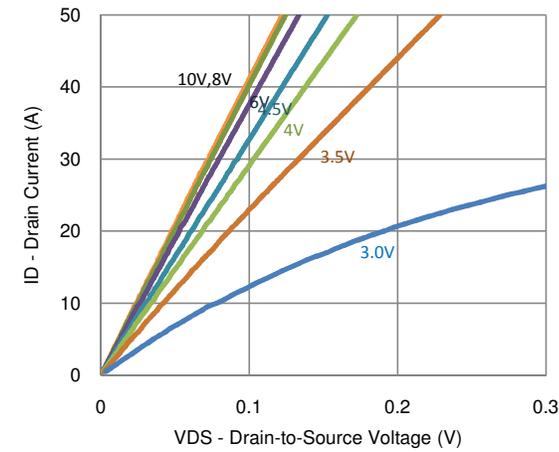
2. Transfer Characteristics



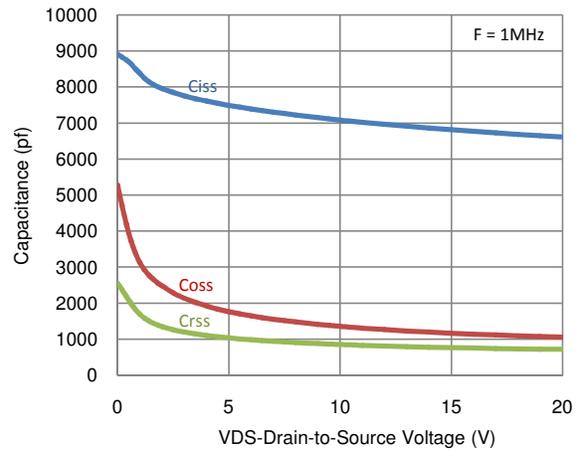
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

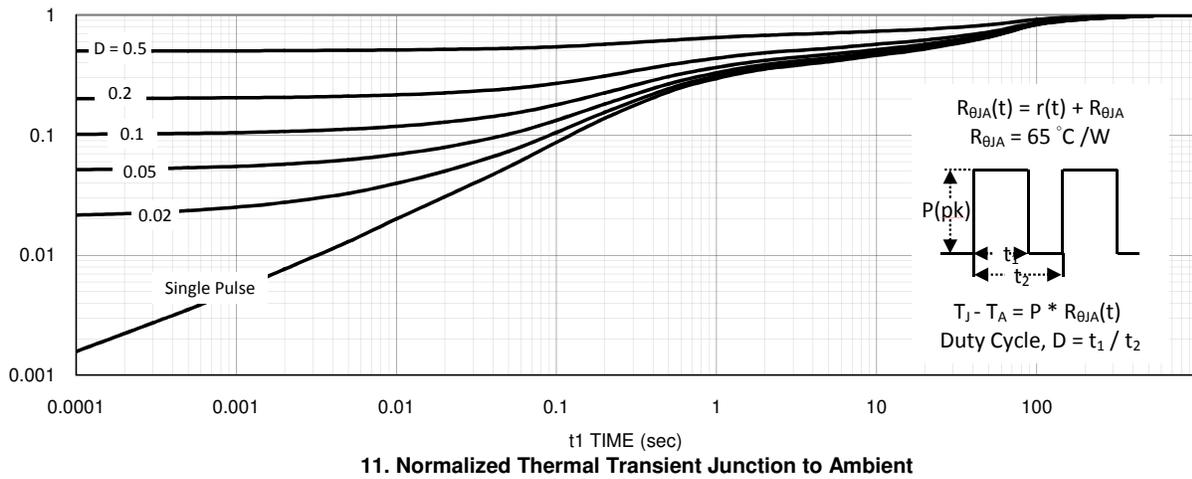
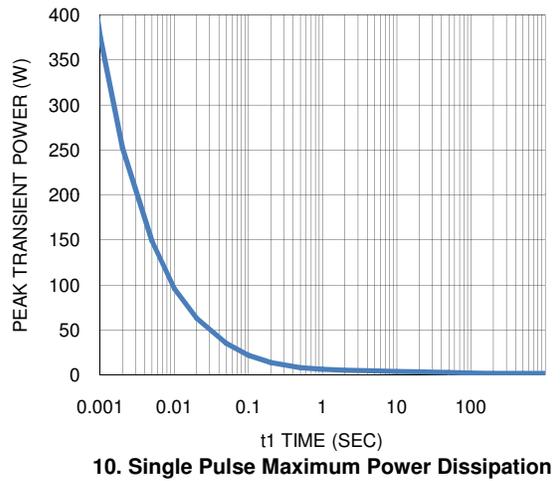
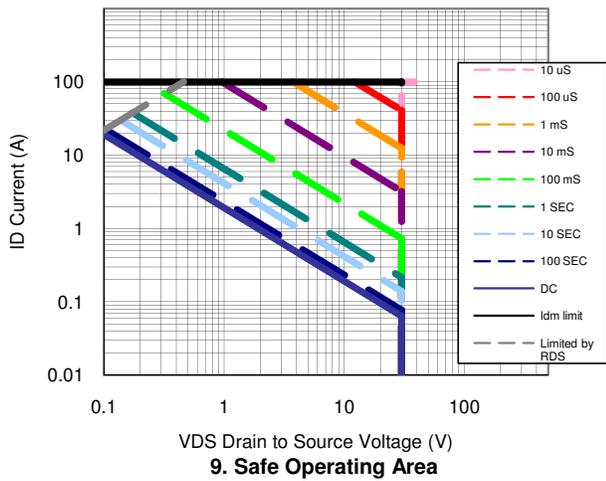
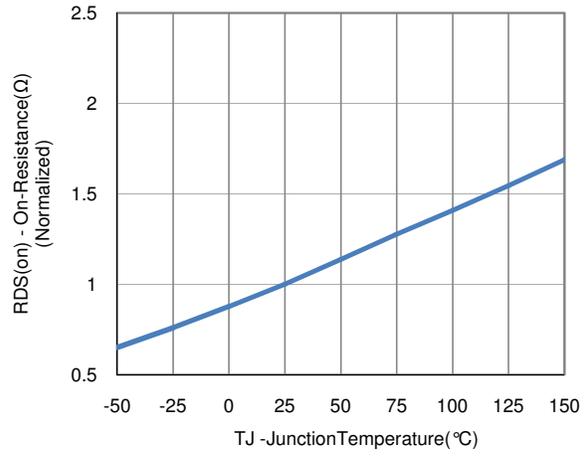
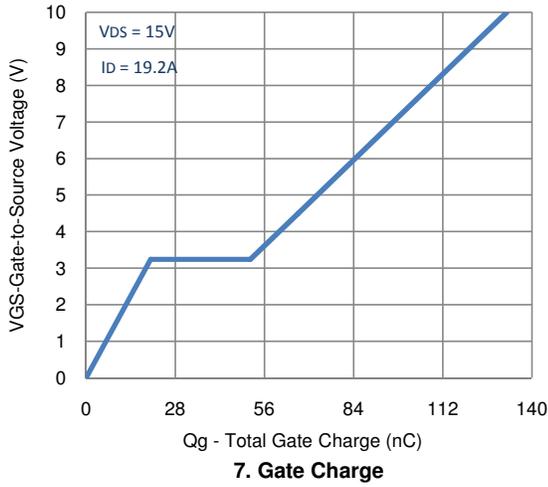


5. Output Characteristics

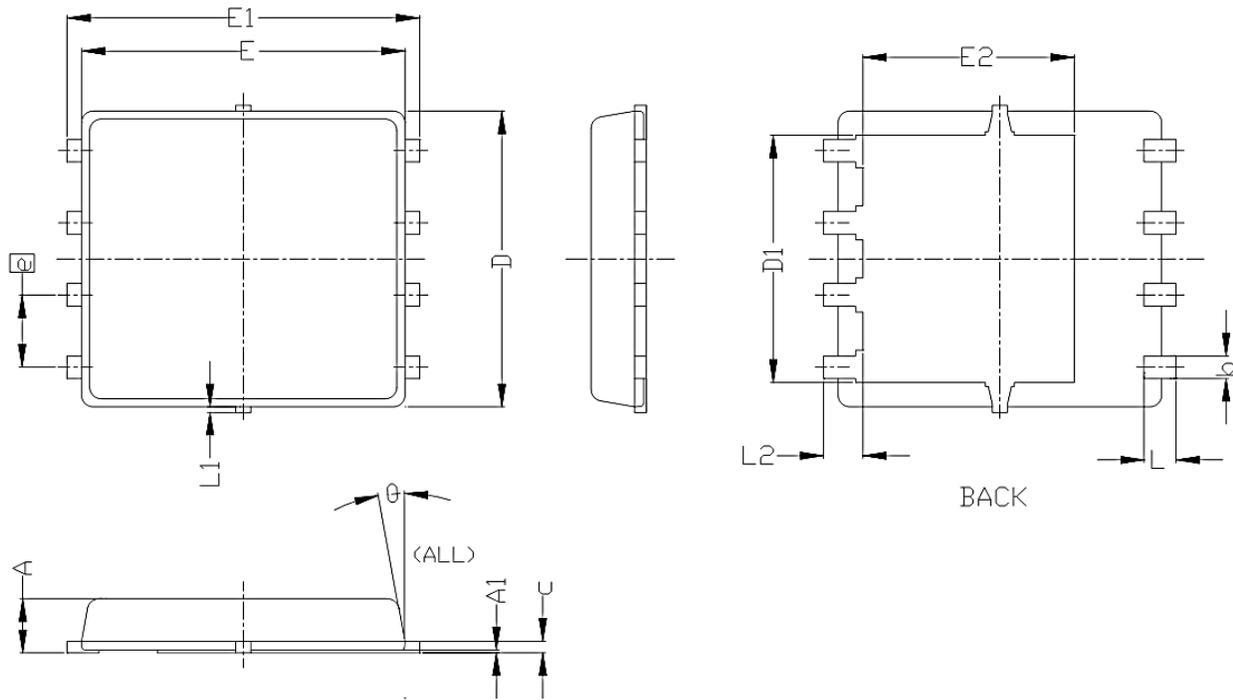


6. Capacitance

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		
$\theta$	0°	---	10°	0°	---	10°