

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

### Key Features:

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

### Typical Applications:

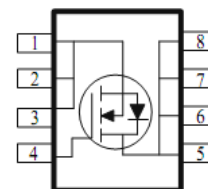
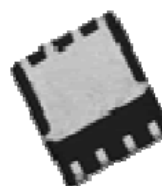
- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
30	4 @ $V_{GS} = 10V$	24.2
	6 @ $V_{GS} = 4.5V$	19.8



RoHS  
COMPLIANT  
HALOGEN  
FREE

DFN3x3-8L



### 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>	$I_D$	$T_A = 25^\circ\text{C}$	24.2
		$T_A = 70^\circ\text{C}$	18.3
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	100	A
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	5	A
Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	3.5
		$T_A = 70^\circ\text{C}$	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>	$R_{\theta JA}$	t $\leq$ 10 sec	35
		Steady State	81

### Notes

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

## Electrical Characteristics

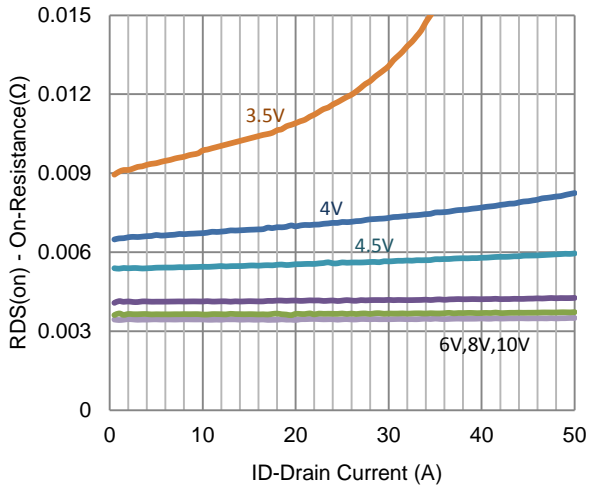
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24 V, V_{GS} = 0 V$			1	uA
		$V_{DS} = 24 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 10 V$	30			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 V, I_D = 20 A$			4	m $\Omega$
		$V_{GS} = 4.5 V, I_D = 16 A$			6	
Forward Transconductance	$g_{fs}$	$V_{DS} = 15 V, I_D = 20 A$		25		S
Diode Forward Voltage	$V_{SD}$	$I_S = 2.5 A, V_{GS} = 0 V$		0.72		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15 V, V_{GS} = 4.5 V,$ $I_D = 20 A$		32		nC
Gate-Source Charge	$Q_{gs}$			13		
Gate-Drain Charge	$Q_{gd}$			13		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 15 V, R_L = 0.8 \Omega,$ $I_D = 20 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$		13		ns
Rise Time	$t_r$			15		
Turn-Off Delay Time	$t_{d(off)}$			75		
Fall Time	$t_f$			25		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		5022		pF
Output Capacitance	$C_{oss}$			424		
Reverse Transfer Capacitance	$C_{rss}$			358		

## Notes

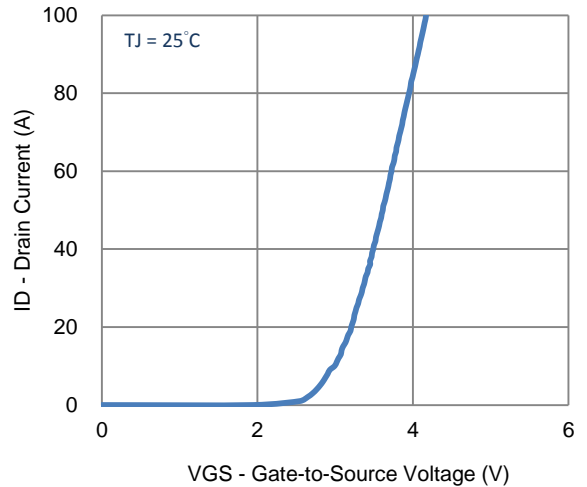
- Pulse test:  $PW \leq 300 \mu s$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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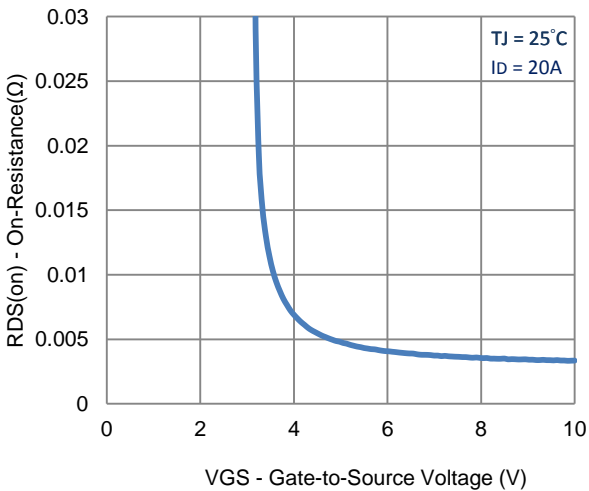
Typical Electrical Characteristics



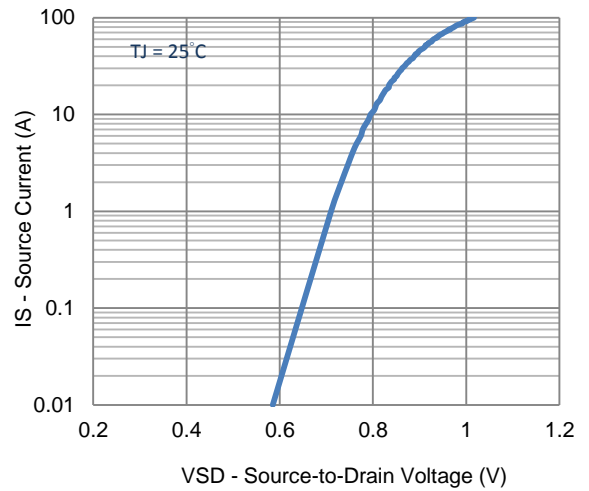
1. On-Resistance vs. Drain Current



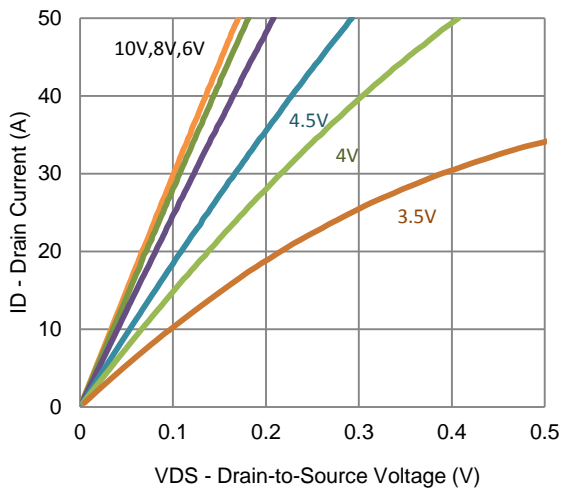
2. Transfer Characteristics



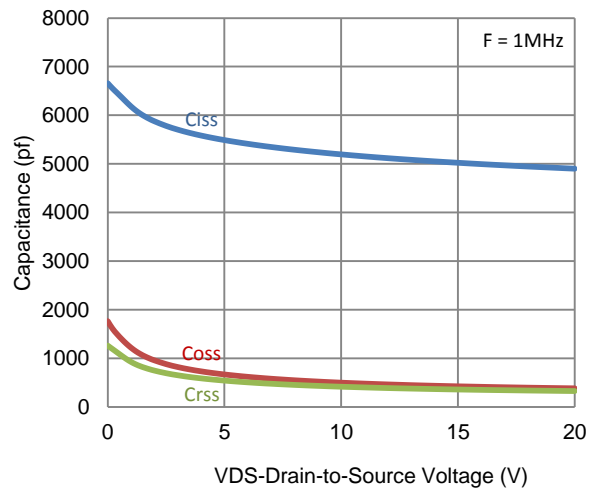
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

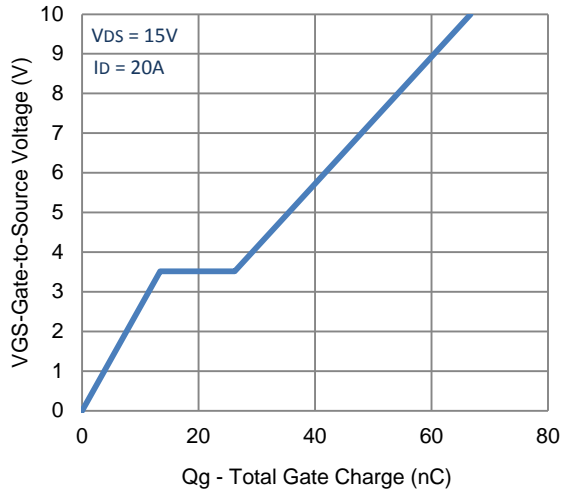


5. Output Characteristics

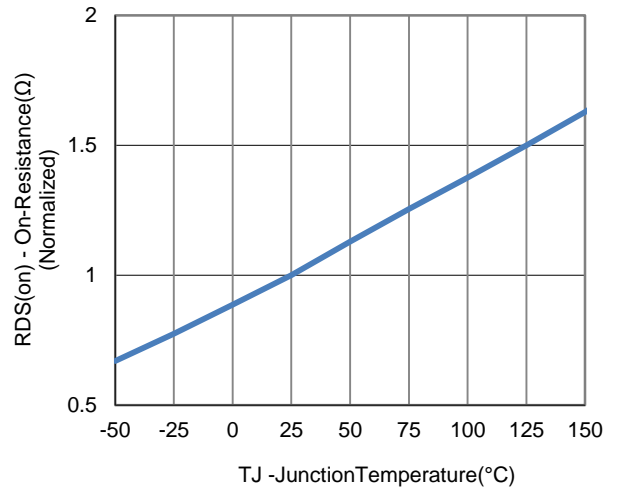


6. Capacitance

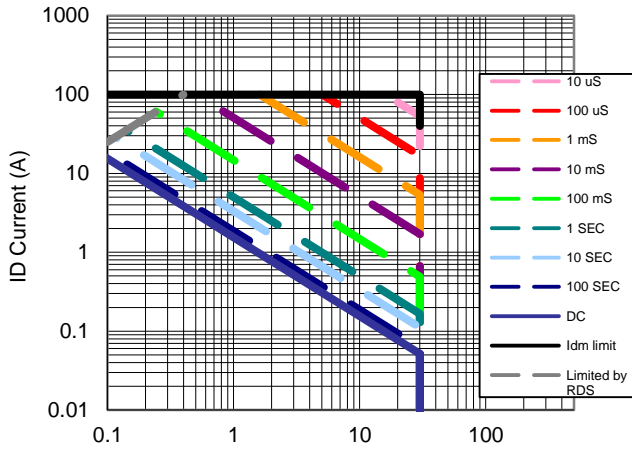
Typical Electrical Characteristics



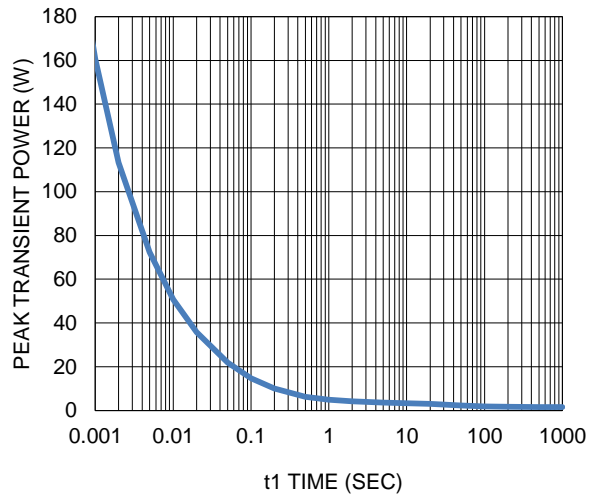
7. Gate Charge



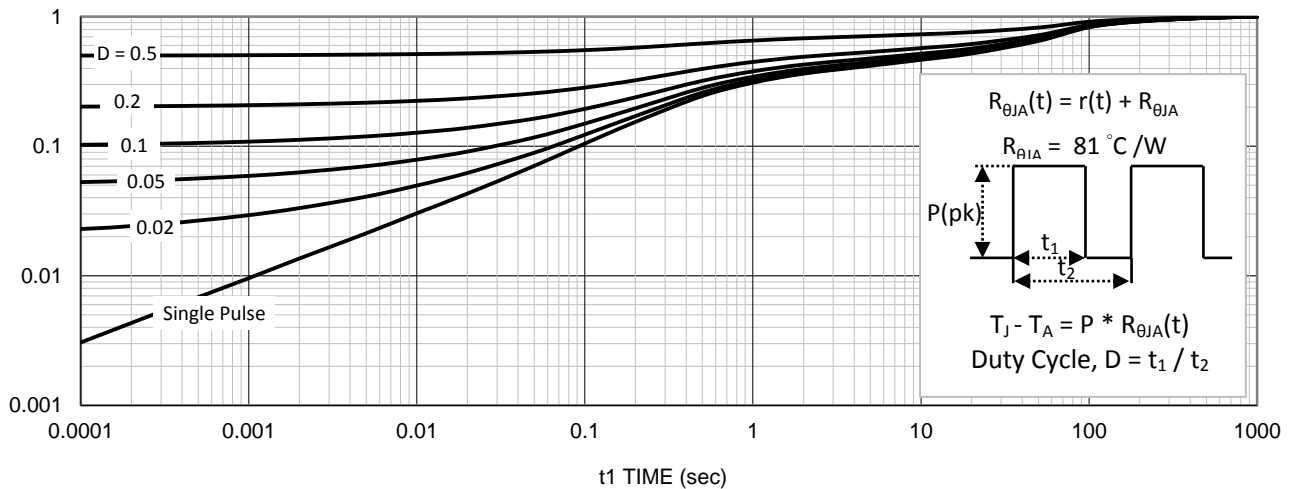
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

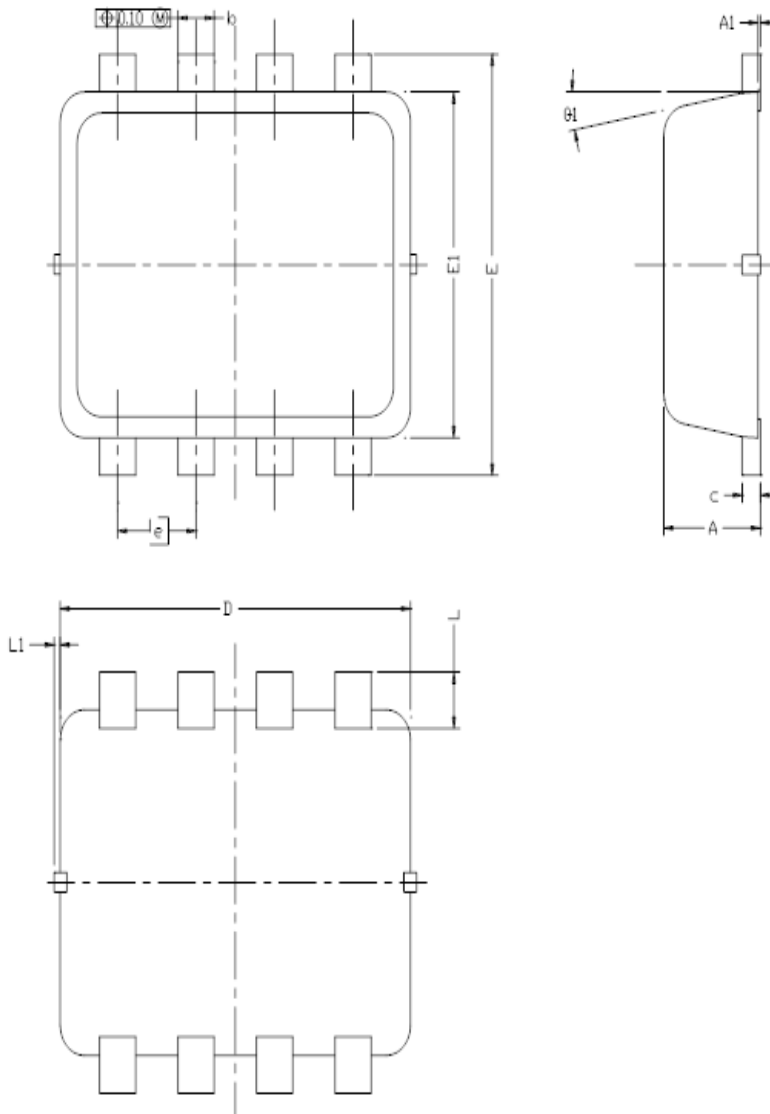


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

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	0.08	0.152	0.25	0.003	0.006	0.010
D	2.90 BSC			0.114 BSC		
E	2.80 BSC			0.110 BSC		
E1	2.30 BSC			0.091 BSC		
e	0.65 BSC			0.026 BSC		
L	0.20	0.375	0.450	0.008	0.0148	0.0177
L1	0	---	0.100	0	---	0.004
$\theta 1$	0	10	12	0	10	12