

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

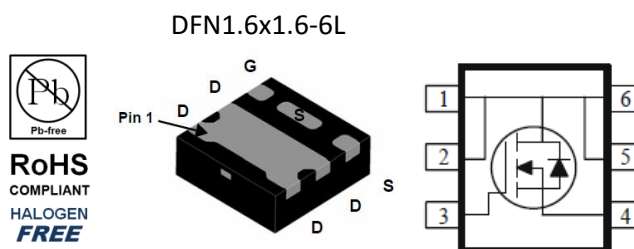
### Key Features:

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

### Typical Applications:

- Power Routing
- Li Ion Battery Packs
- Level Shifting and Driver Circuits

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
30	27 @ $V_{GS} = 4.5V$	7.3
	38 @ $V_{GS} = 2.5V$	6.1



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		$V_{GS}$	$\pm 12$	
Continuous Drain Current <sup>a</sup>	$T_A = 25^\circ\text{C}$	$I_D$	7.3	A
	$T_A = 70^\circ\text{C}$		4.2	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	25	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	1.9	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	$P_D$	2.1	W
	$T_A = 70^\circ\text{C}$		0.7	
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	$R_{\theta JA}$	70	$^\circ\text{C/W}$
	Steady State		100	

### Notes

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

## Electrical Characteristics

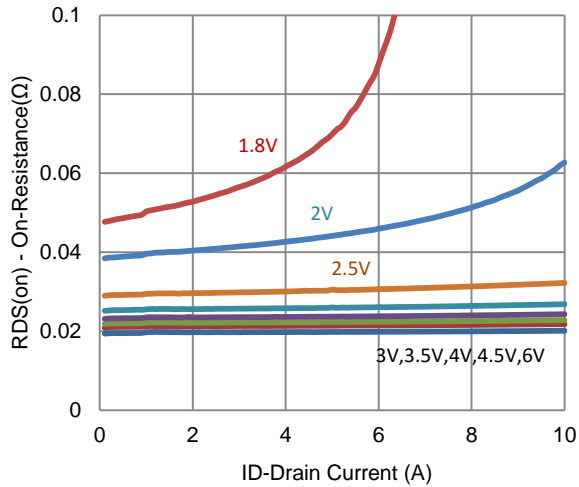
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	0.4			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 12 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24 V, V_{GS} = 0 V$			1	uA
		$V_{DS} = 24 V, V_{GS} = 0 V, T_J = 55^\circ C$			10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 4.5 V$	10			A
Drain-Source On-Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = 4.5 V, I_D = 5 A$			27	mΩ
		$V_{GS} = 2.5 V, I_D = 4 A$			38	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 15 V, I_D = 5 A$		20		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = 0.9 A, V_{GS} = 0 V$		0.71		V
<b>Dynamic <sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15 V, V_{GS} = 4.5 V,$ $I_D = 4 A$		7		nC
Gate-Source Charge	$Q_{gs}$			0.9		
Gate-Drain Charge	$Q_{gd}$			2.2		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 15 V, R_L = 3.8 \Omega,$ $I_D = 4 A,$ $V_{GEN} = 4.5 V, R_{GEN} = 6 \Omega$		8		ns
Rise Time	$t_r$			17		
Turn-Off Delay Time	$t_{d(off)}$			44		
Fall Time	$t_f$			11		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 \text{ Mhz}$		561		pF
Output Capacitance	$C_{oss}$			55		
Reverse Transfer Capacitance	$C_{rss}$			45		

## Notes

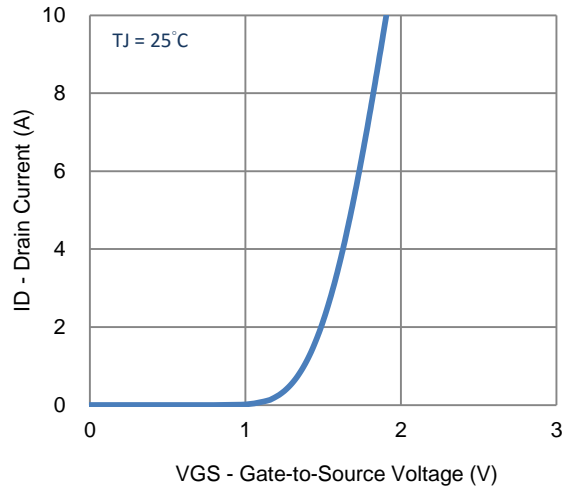
- Pulse test: PW <= 300us duty cycle <= 2%.
- Guaranteed by design, not subject to production testing.

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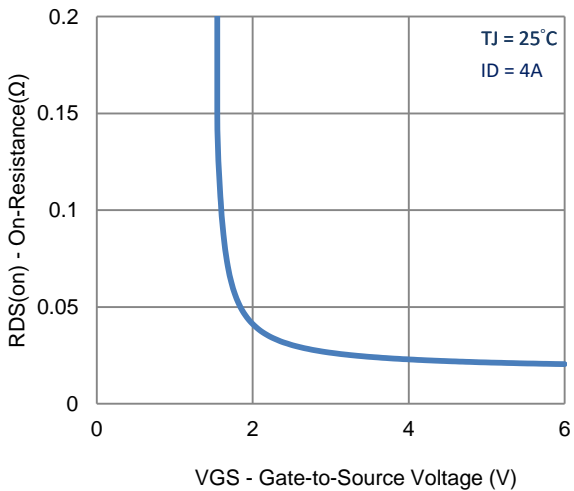
Typical Electrical Characteristics



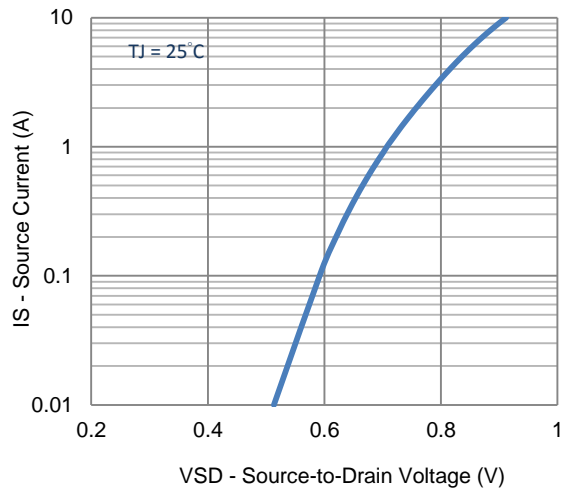
1. On-Resistance vs. Drain Current



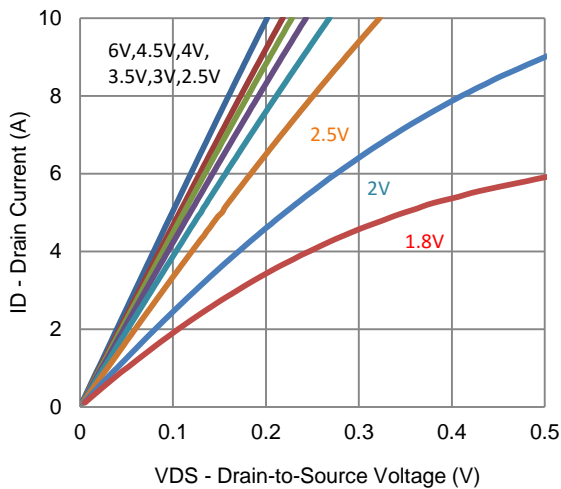
2. Transfer Characteristics



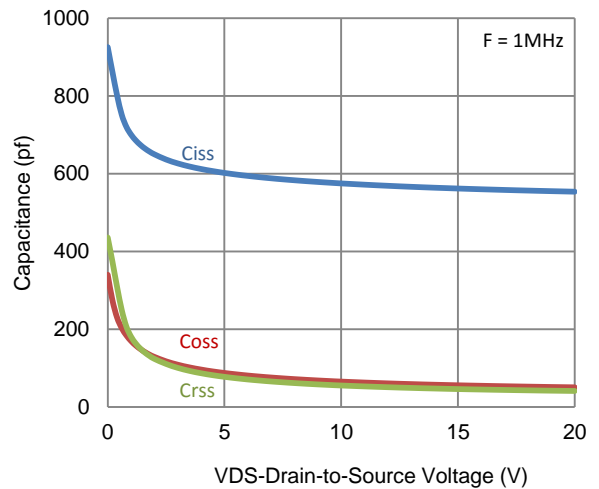
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

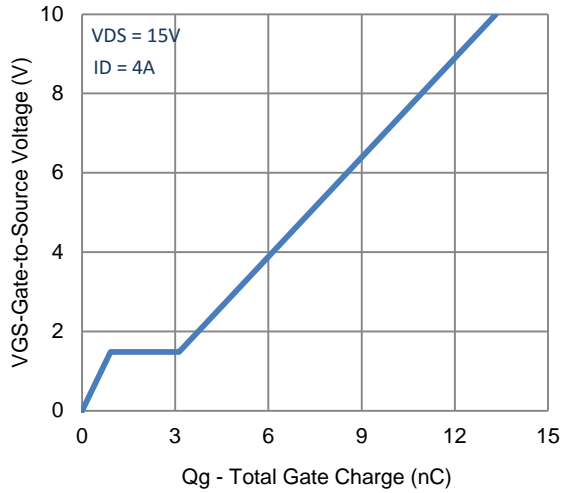


5. Output Characteristics

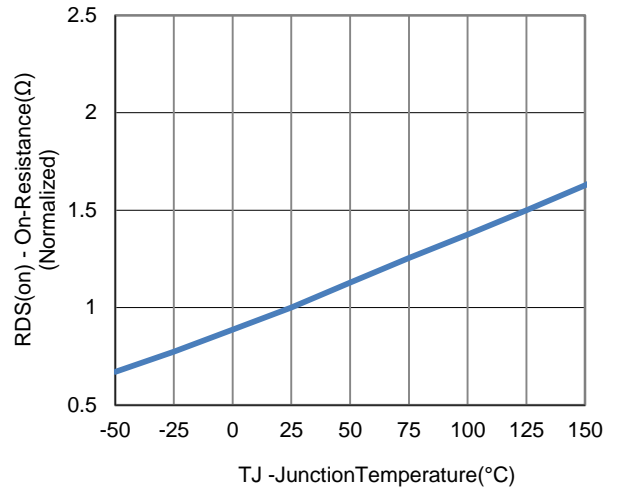


6. Capacitance

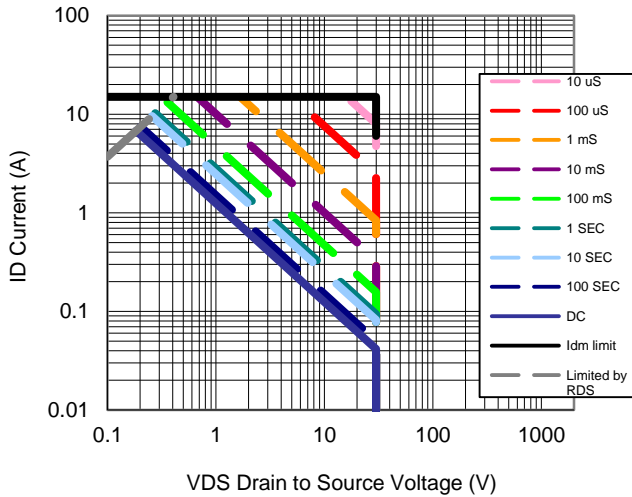
Typical Electrical Characteristics



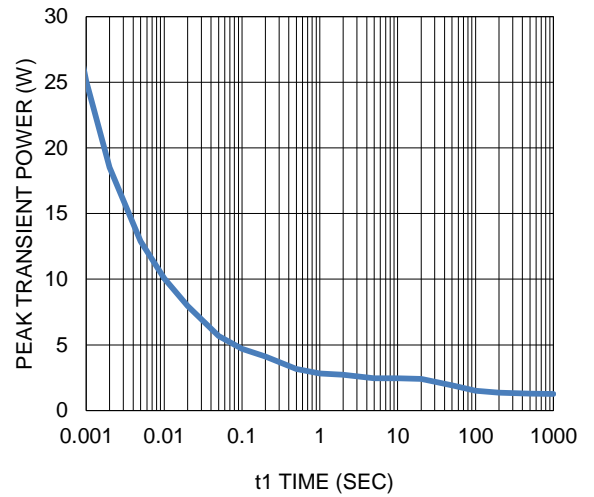
7. Gate Charge



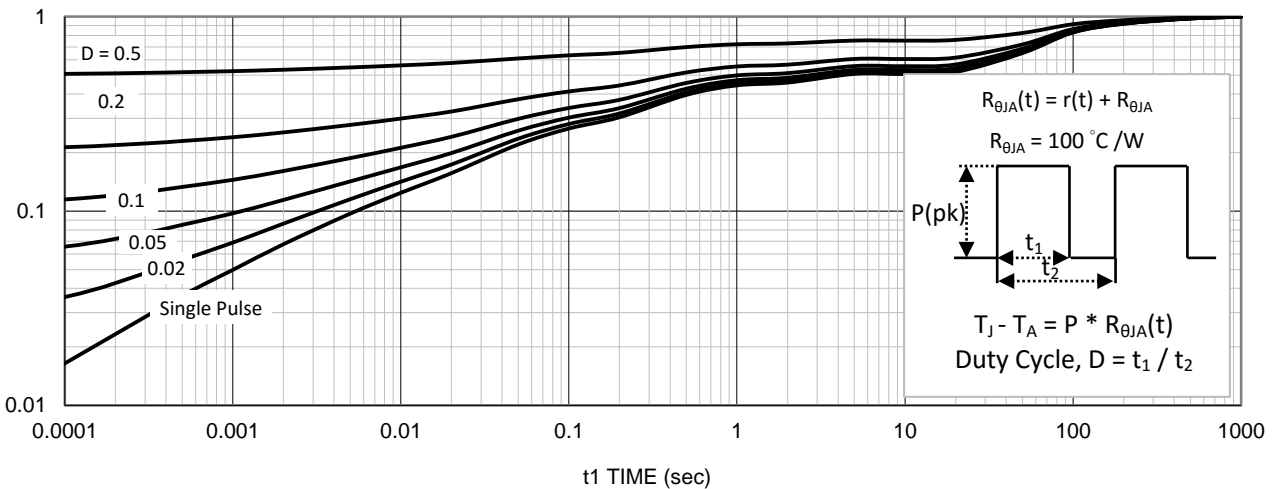
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

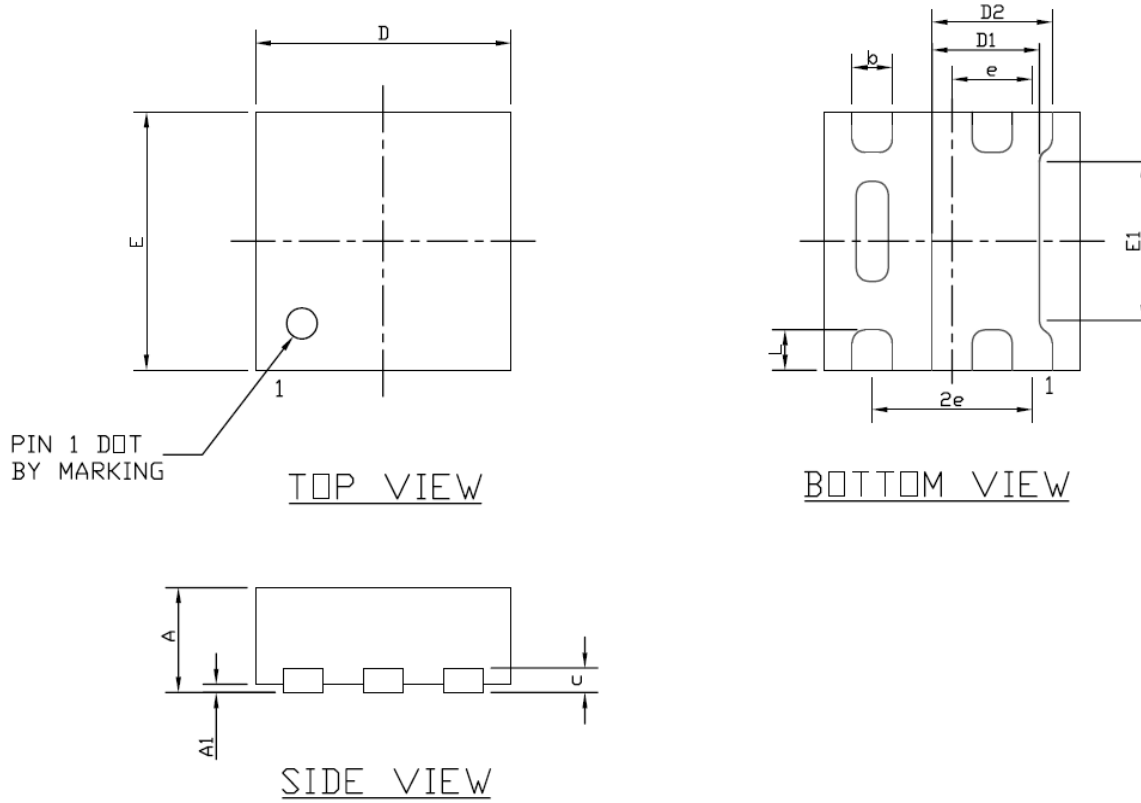


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.50	0.55	0.60	0.020	0.022	0.024
A1	0.00	---	0.05	0.000	---	0.002
b	0.22	0.25	0.28	0.009	0.010	0.011
c	0.152 Ref.			0.006 Ref.		
D	1.55	1.60	1.65	0.061	0.063	0.065
D1	0.67 TYP			0.026 TYP		
D2	0.75 TYP			0.030 TYP		
E	1.55	1.60	1.65	0.061	0.063	0.065
E1	0.98 TYP			0.039 TYP		
e	0.50 BSC			0.020 BSC		
L	0.20	0.25	0.30	0.008	0.010	0.012