

## Dual N-Channel 20-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

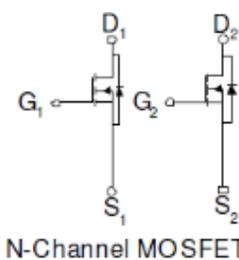
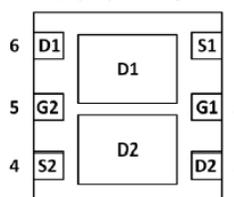
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
20	23 @ $V_{GS} = 4.5V$	6.6
	33 @ $V_{GS} = 2.5V$	5.6



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

DFN2x2-6L

Bottom View



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

Parameter	Symbol	Limit	Units
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	
Continuous Drain Current <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	6.6
		$T_A = 70^\circ\text{C}$	5.3
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	25	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	2.1	A
Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.5
		$T_A = 70^\circ\text{C}$	0.95
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	50
		Steady State	105

### Notes

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

## Electrical Characteristics

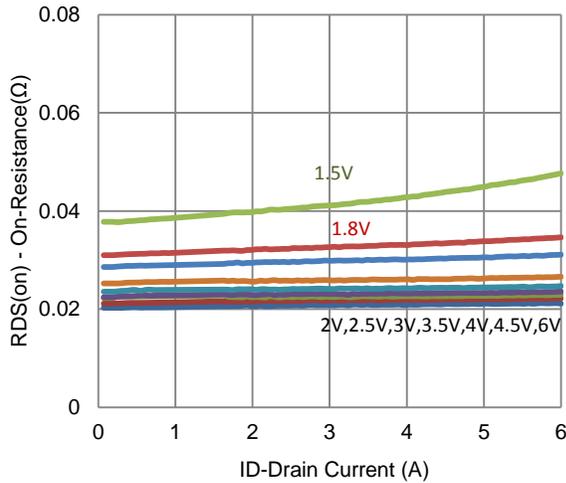
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	0.4			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 8 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 16 V, V_{GS} = 0 V$			1	uA
		$V_{DS} = 16 V, V_{GS} = 0 V, T_J = 55^\circ C$			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>	$r_{DS(on)}$	$V_{GS} = 4.5 V, I_D = 5.3 A$			23	mΩ
		$V_{GS} = 2.5 V, I_D = 4.3 A$			33	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 15 V, I_D = 5.3 A$		5		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = 1.1 A, V_{GS} = 0 V$		0.73		V
<b>Dynamic <sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 10 V, V_{GS} = 4.5 V,$ $I_D = 5.3 A$		11		nC
Gate-Source Charge	$Q_{gs}$			2.1		
Gate-Drain Charge	$Q_{gd}$			2.9		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 10 V, R_L = 1.9 \Omega,$ $I_D = 5.3 A,$ $V_{GEN} = 4.5 V, R_{GEN} = 6 \Omega$		7		ns
Rise Time	$t_r$			31		
Turn-Off Delay Time	$t_{d(off)}$			55		
Fall Time	$t_f$			17		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 \text{ Mhz}$		726		pF
Output Capacitance	$C_{oss}$			74		
Reverse Transfer Capacitance	$C_{rss}$			69		

## Notes

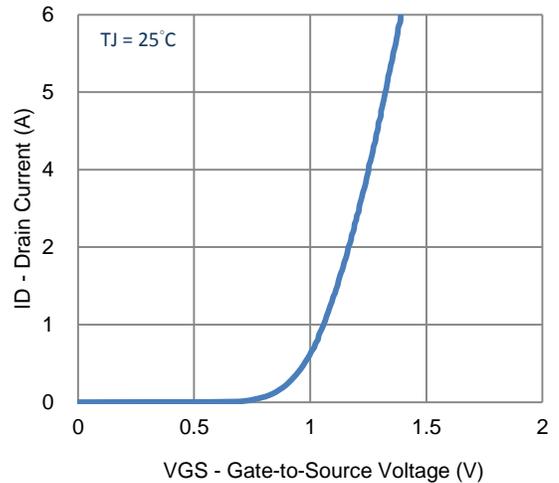
- Pulse test:  $PW \leq 300 \mu s$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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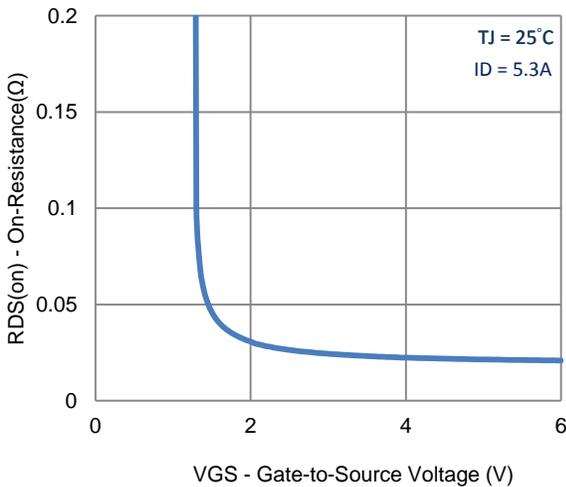
### Typical Electrical Characteristics



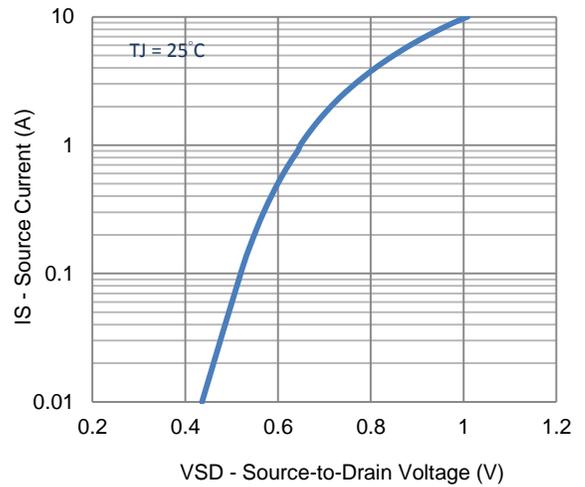
1. On-Resistance vs. Drain Current



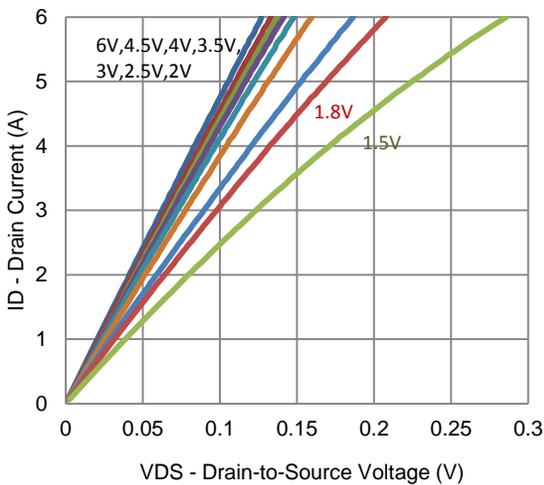
2. Transfer Characteristics



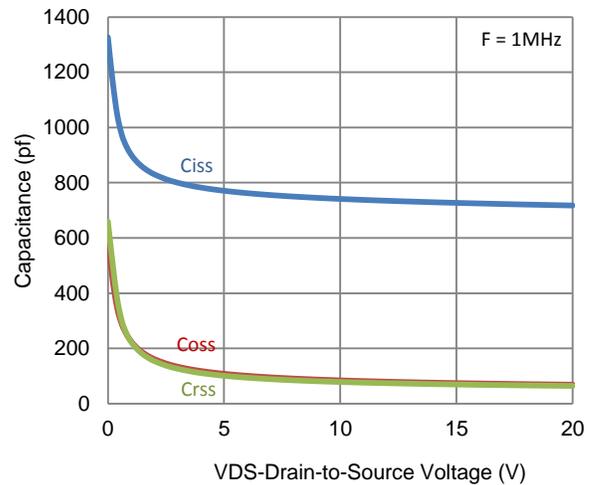
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

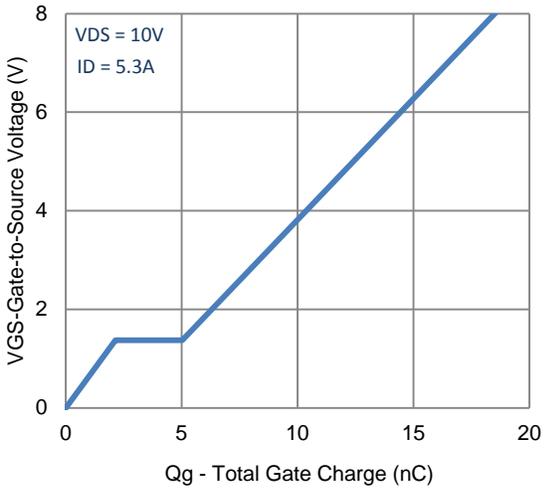


5. Output Characteristics

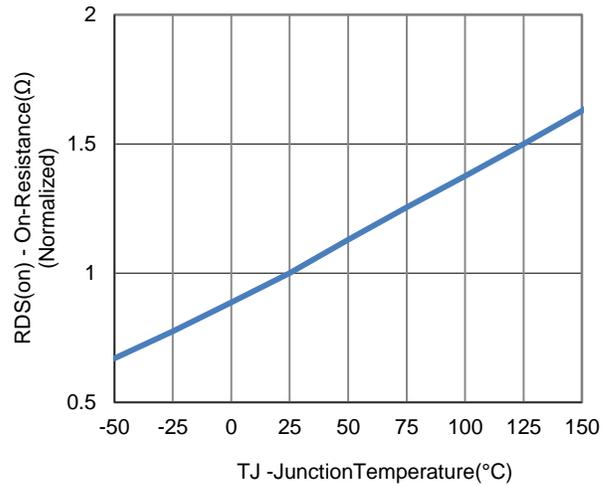


6. Capacitance

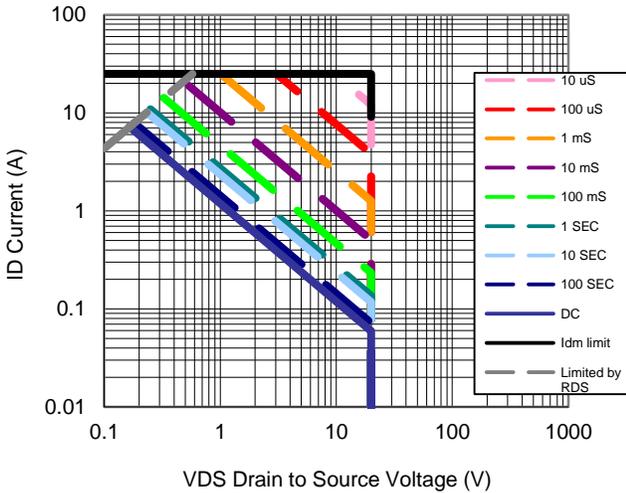
Typical Electrical Characteristics



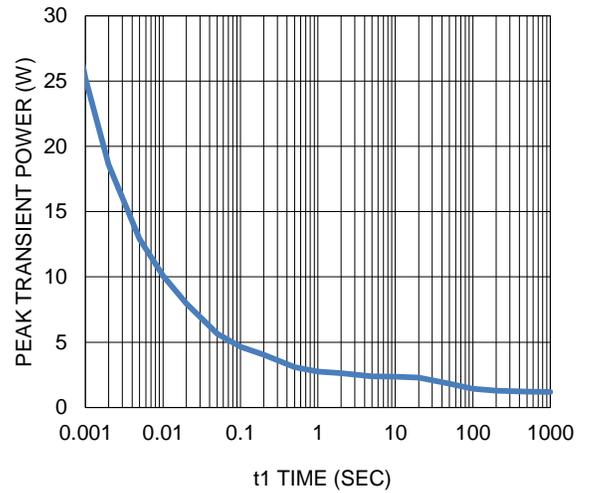
7. Gate Charge



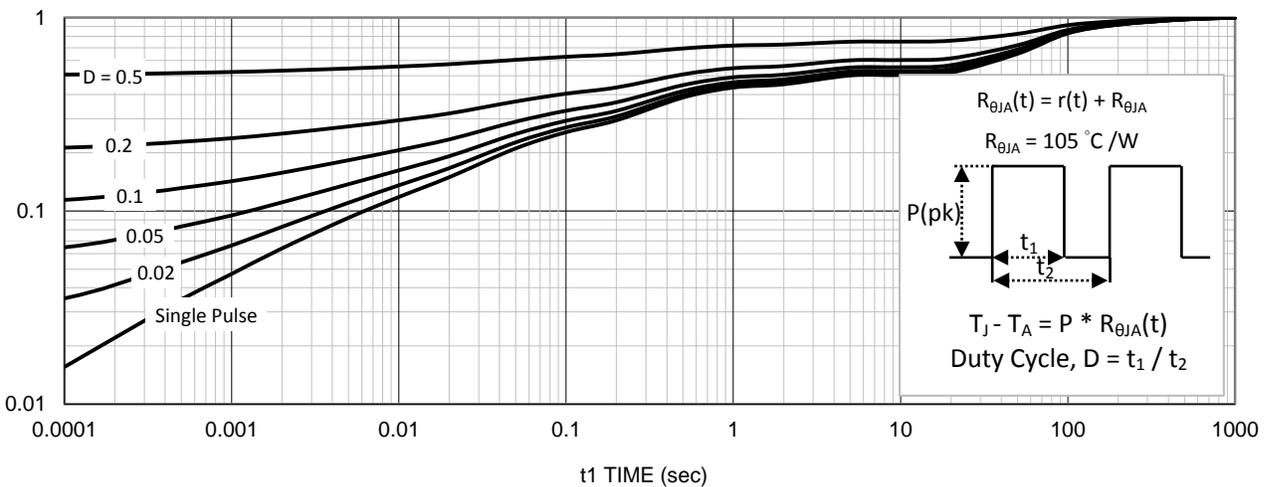
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

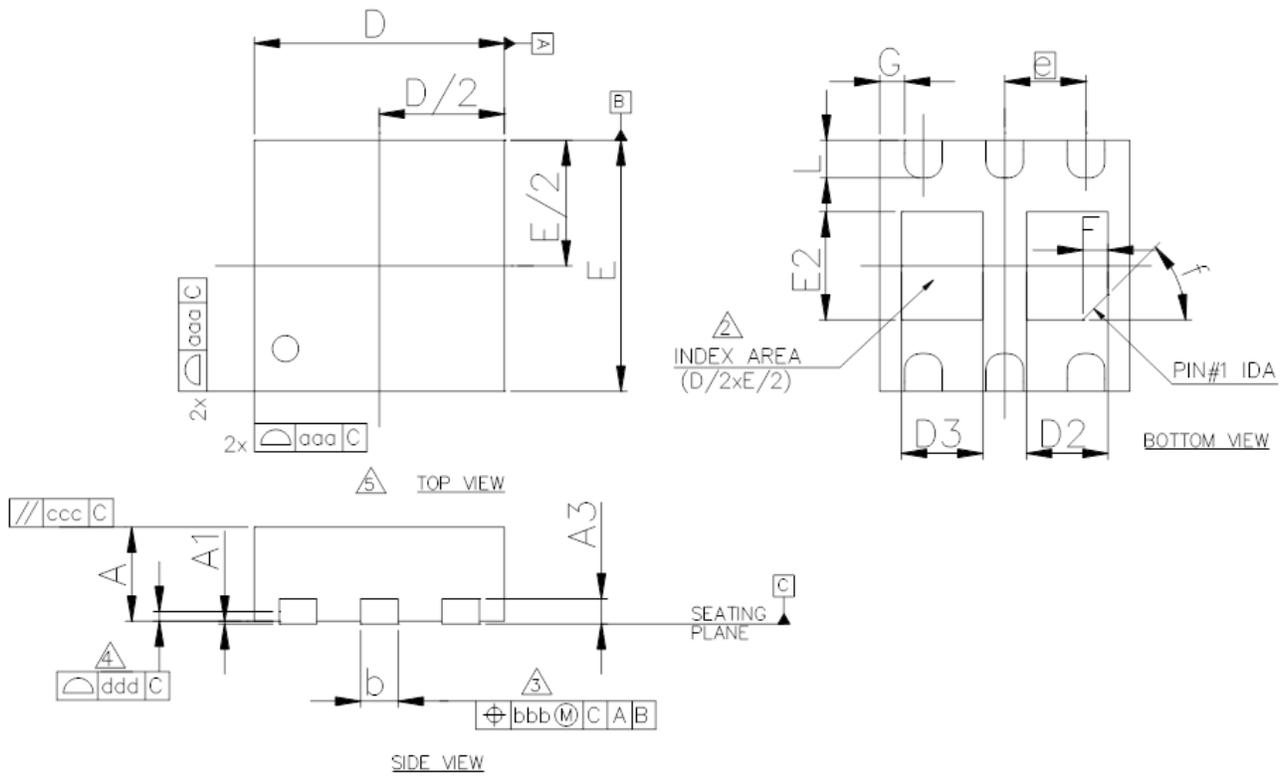


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



SYMBOL	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	0.028	0.030	0.032
A1	0.00	0.02	0.05	0.000	0.001	0.002
A3	---	0.20 ref	---	---	0.008 ref	---
b	0.25	0.30	0.35	0.010	0.012	0.014
d	2.00 BSC			0.079 BSC		
D2	0.60	0.65	0.70	0.024	0.026	0.028
D3	0.60	0.65	0.70	0.024	0.026	0.028
E	2.00 BSC			0.079 BSC		
E2	0.81	0.86	0.91	0.032	0.034	0.036
e	0.65 BSC			0.026 BSC		
L	0.25	0.30	0.35	0.010	0.012	0.014
F	0.20 REF			0.008 REF		
f	45?			45?		
G	0.15	0.20	0.25	0.006	0.008	0.010
aaa	0.15			0.006		
bbb	0.10			0.004		
ccc	0.10			0.004		
ddd	0.08			0.003		