

Dual N-Channel 20-V (D-S) MOSFET

Key Features:

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

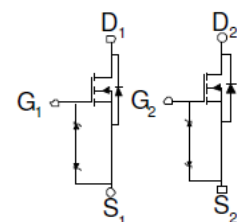
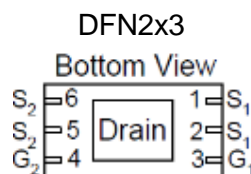
Typical Applications:

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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
20	9.9 @ $V_{GS} = 4.5V$	11
	14 @ $V_{GS} = 2.5V$	9



RoHS
COMPLIANT
HALOGEN
FREE



N-Channel MOSFET

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}	± 12	
Continuous Drain Current ^a	I_D	$T_A = 25^\circ\text{C}$	11
		$T_A = 70^\circ\text{C}$	9
Pulsed Drain Current ^b	I_{DM}	40	A
Continuous Source Current (Diode Conduction) ^a	I_S	7	A
Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	1.5
		$T_A = 70^\circ\text{C}$	1
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 ^a	$R_{\theta JA}$	$t \leq 10$ sec	83
		Steady State	120

Notes

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

Electrical Characteristics

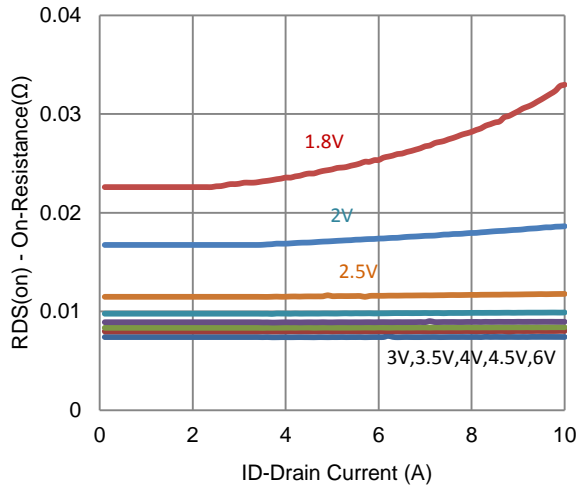
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	0.3			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 12 V$			± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16 V, V_{GS} = 0 V$			1	μA
		$V_{DS} = 16 V, V_{GS} = 0 V, T_J = 55^\circ C$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 10 V$	15			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5 V, I_D = 5 A$			9.9	m Ω
		$V_{GS} = 2.5 V, I_D = 4 A$			14	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10 V, I_D = 5 A$		20		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 3.5 A, V_{GS} = 0 V$		0.76		V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = 10 V, V_{GS} = 4.5 V,$ $I_D = 5 A$		15		nC
Gate-Source Charge	Q_{gs}			2.2		
Gate-Drain Charge	Q_{gd}			4.2		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 10 V, R_L = 2 \Omega,$ $I_D = 5 A,$ $V_{GEN} = 4.5 V, R_{GEN} = 6 \Omega$		148		ns
Rise Time	t_r			277		
Turn-Off Delay Time	$t_{d(off)}$			1616		
Fall Time	t_f			751		
Input Capacitance	C_{iss}	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		1219		pF
Output Capacitance	C_{oss}			150		
Reverse Transfer Capacitance	C_{rss}			123		

Notes

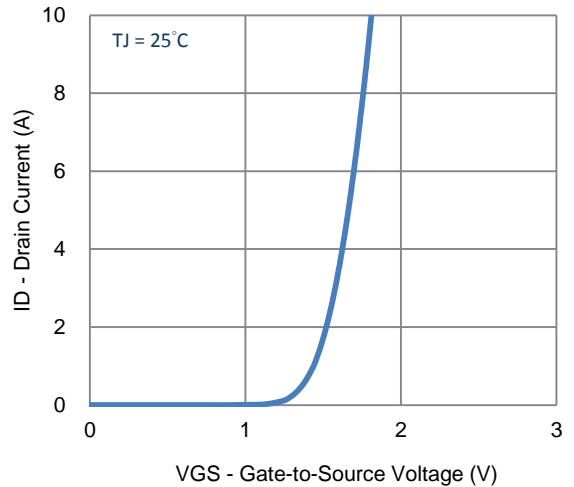
- Pulse test: PW \leq 300us duty cycle \leq 2%.
- Guaranteed by design, not subject to production testing.

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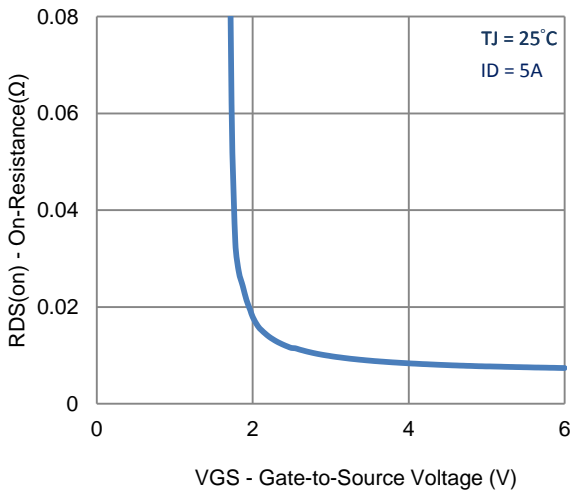
Typical Electrical Characteristics



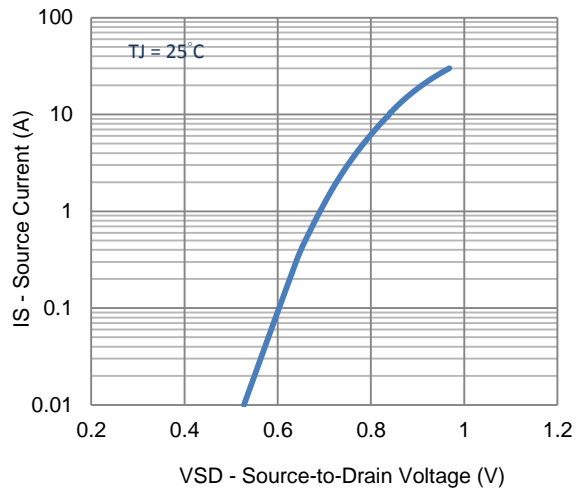
1. On-Resistance vs. Drain Current



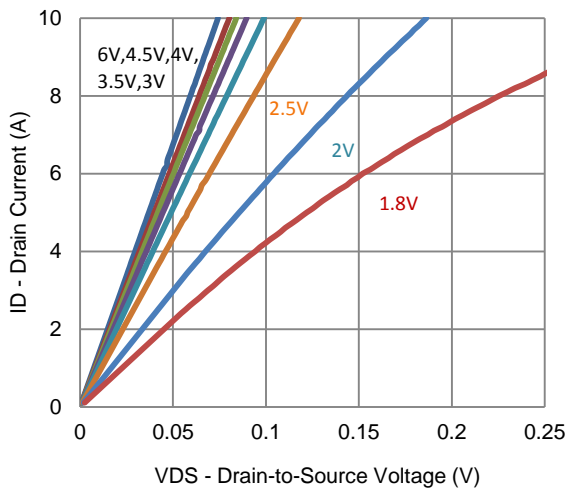
2. Transfer Characteristics



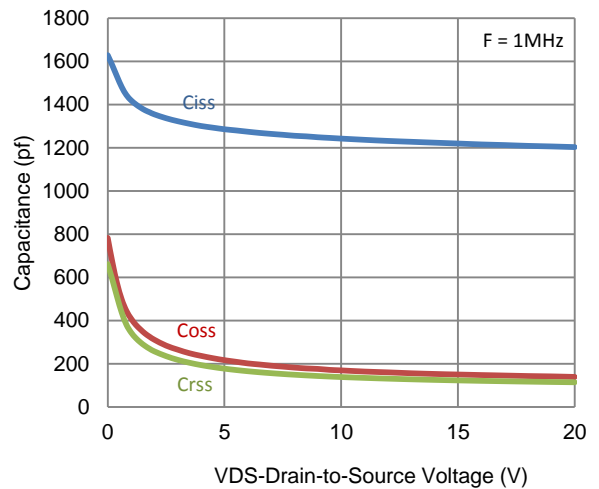
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

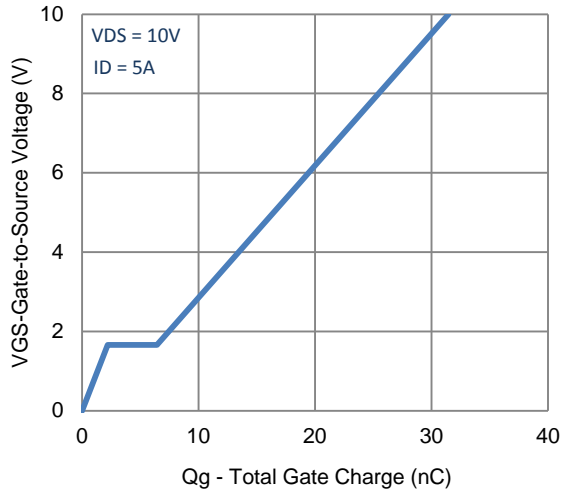


5. Output Characteristics

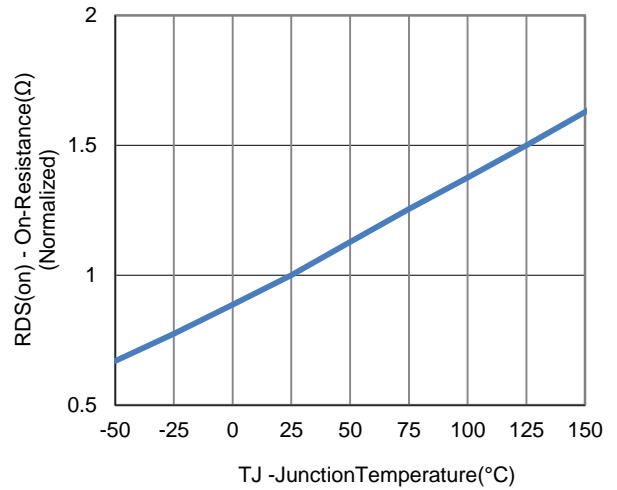


6. Capacitance

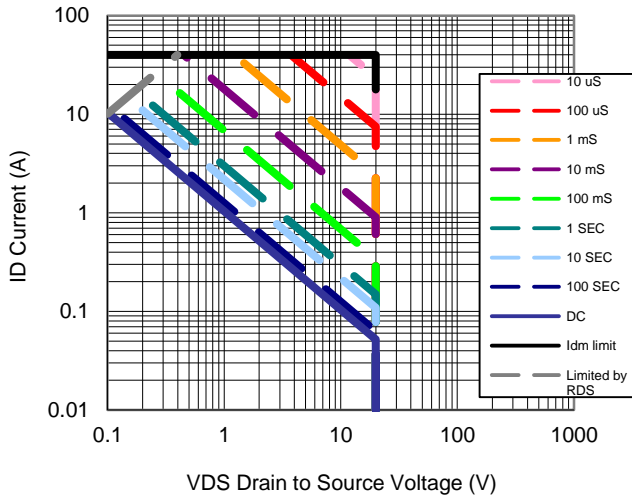
Typical Electrical Characteristics



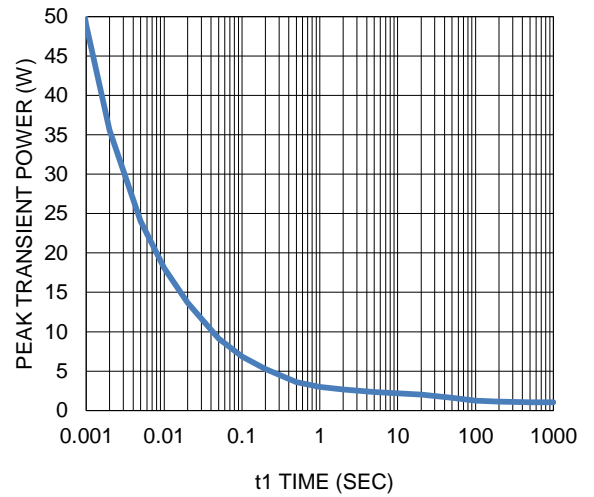
7. Gate Charge



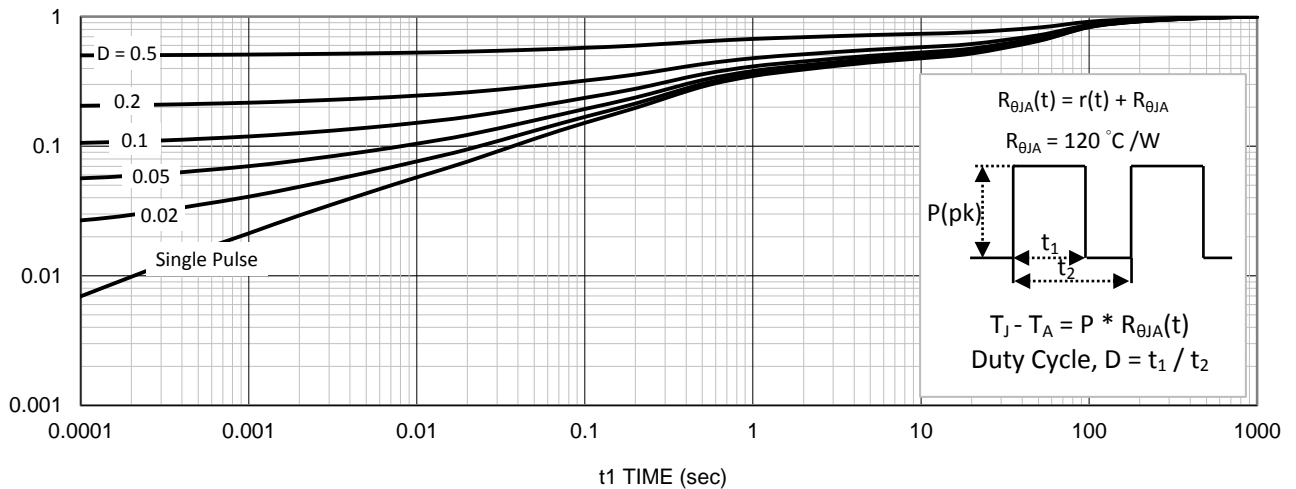
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

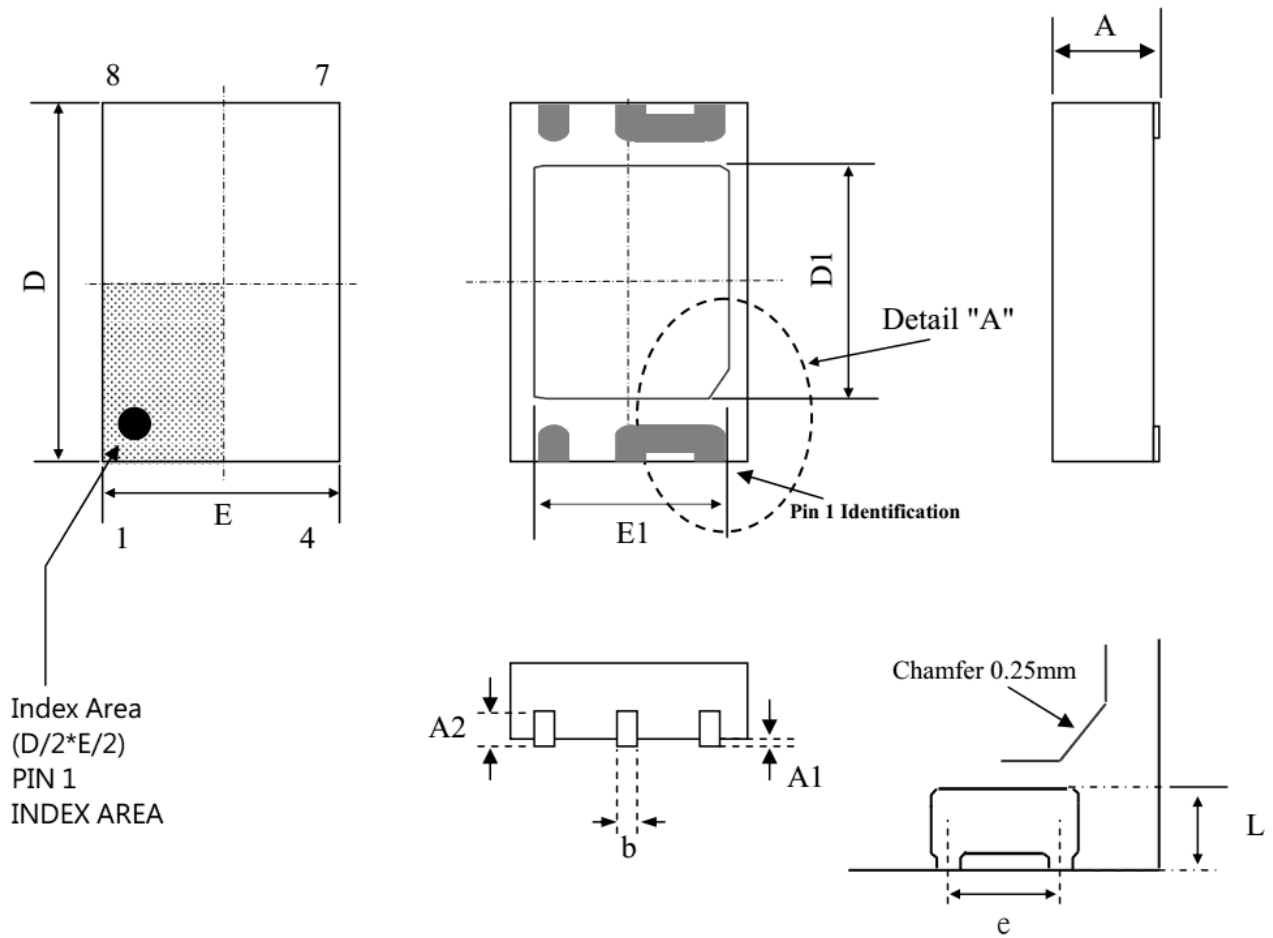


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



Dimension	mm			Dimension	mm		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	0.70	0.75	0.80	D	2.95	3.00	3.05
A1	0.01	0.03	0.05	E	1.95	2.00	2.05
A2	0.19	0.21	0.25	D1	1.65	1.70	1.75
b	0.20	0.25	0.30	E1	1.45	1.50	1.55
e	0.50 BSC			L	0.35	0.40	0.45