

P-Channel 40-V (D-S) MOSFET

Key Features:

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

Typical Applications:

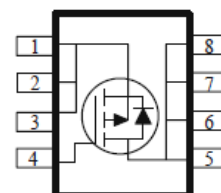
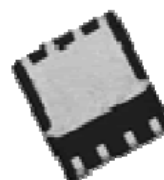
- Load Switches
- DC/DC Conversion
- Motor Drives

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
-40	19 @ $V_{GS} = -10V$	-35 ^c
	27 @ $V_{GS} = -4.5V$	-33



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}	-40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	$T_C = 25^\circ\text{C}$	-35 ^c
		$T_C = 70^\circ\text{C}$	-31
		$T_A = 25^\circ\text{C}$	-12 ^a
		$T_A = 70^\circ\text{C}$	-8.4 ^a
Pulsed Drain Current ^b	I_{DM}	-60	A
Continuous Source Current (Diode Conduction) ^a	I_S	-4.7	
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	42
		$T_C = 70^\circ\text{C}$	27
		$T_A = 25^\circ\text{C}$	3.5 ^a
		$T_A = 70^\circ\text{C}$	2 ^a
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	35
		Steady State	81
Maximum Junction-to-Case	$R_{\theta JC}$	3	$^\circ\text{C}/\text{W}$

Notes

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

Electrical Characteristics

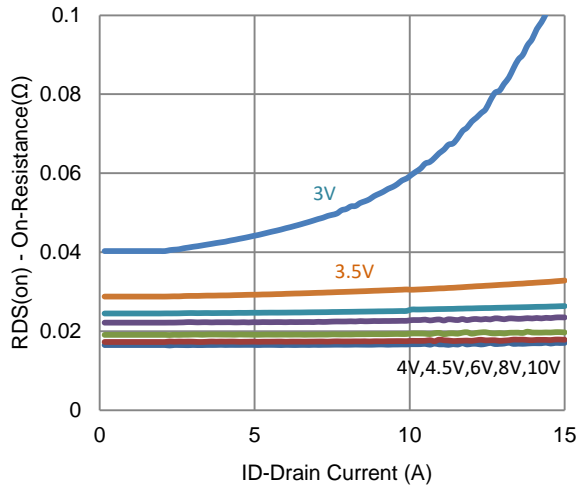
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -32 V, V_{GS} = 0 V$			-1	uA
		$V_{DS} = -32 V, V_{GS} = 0 V, T_J = 55^\circ C$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -10 V$	-18			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10 V, I_D = -8.9 A$			19	mΩ
		$V_{GS} = -4.5 V, I_D = -7.2 A$			27	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15 V, I_D = -8.9 A$		9		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -2.4 A, V_{GS} = 0 V$		-0.77		V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = -20 V, V_{GS} = -4.5 V,$ $I_D = -8.9 A$		23		nC
Gate-Source Charge	Q_{gs}			5.9		
Gate-Drain Charge	Q_{gd}			10		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -20 V, R_L = 2.3 \Omega,$ $I_D = -8.9 A,$ $V_{GEN} = -10 V, R_{GEN} = 6 \Omega$		5		ns
Rise Time	t_r			42		
Turn-Off Delay Time	$t_{d(off)}$			84		
Fall Time	t_f			43		
Input Capacitance	C_{iss}	$V_{DS} = -15 V, V_{GS} = 0 V, f = 1 Mhz$		2348		pF
Output Capacitance	C_{oss}			266		
Reverse Transfer Capacitance	C_{rss}			232		

Notes

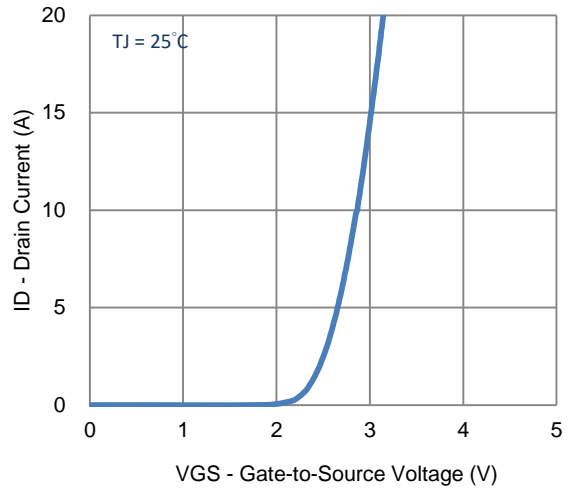
- Pulse test: PW ≤ 300us duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

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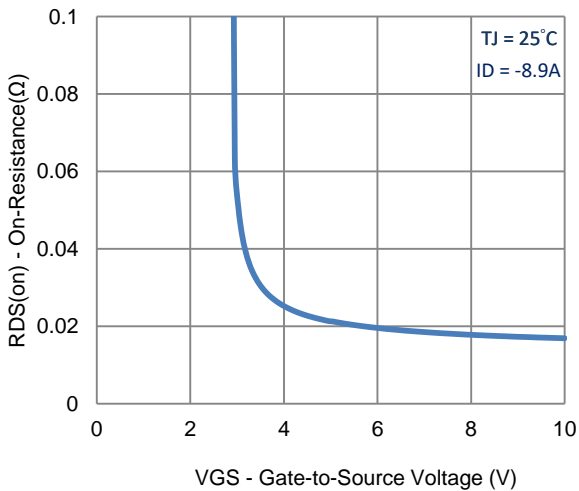
Typical Electrical Characteristics



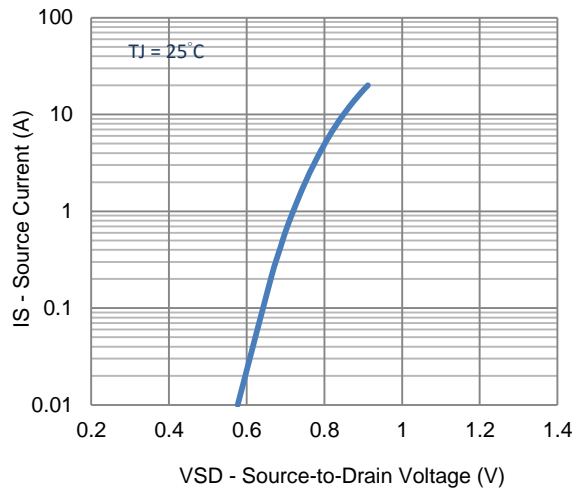
1. On-Resistance vs. Drain Current



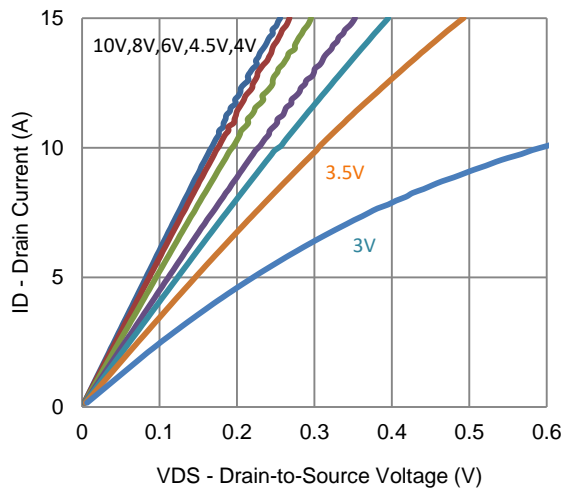
2. Transfer Characteristics



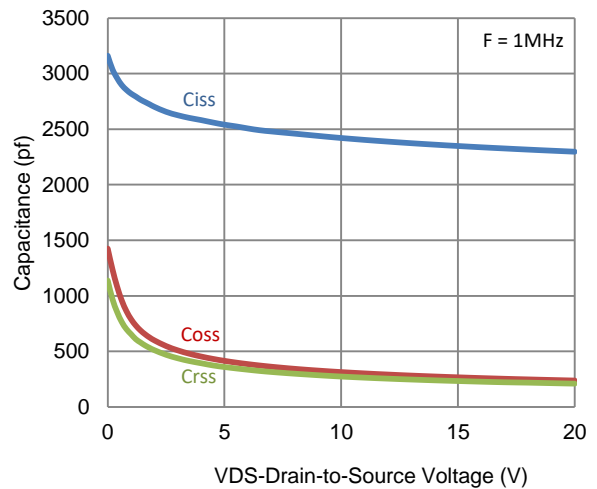
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

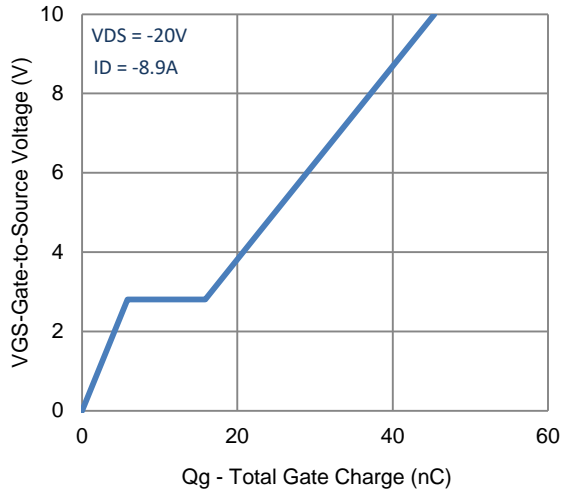


5. Output Characteristics

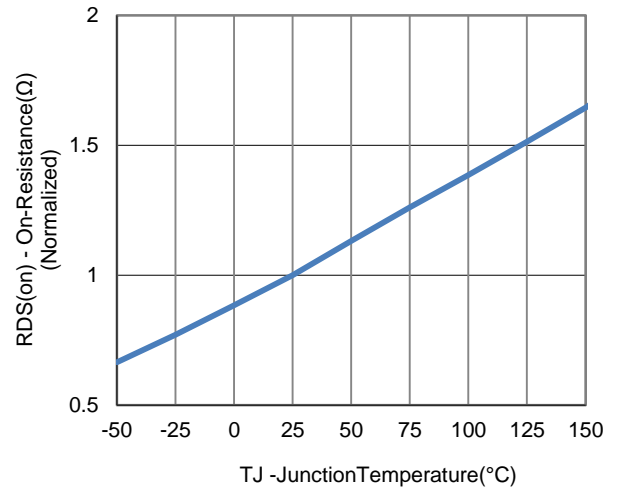


6. Capacitance

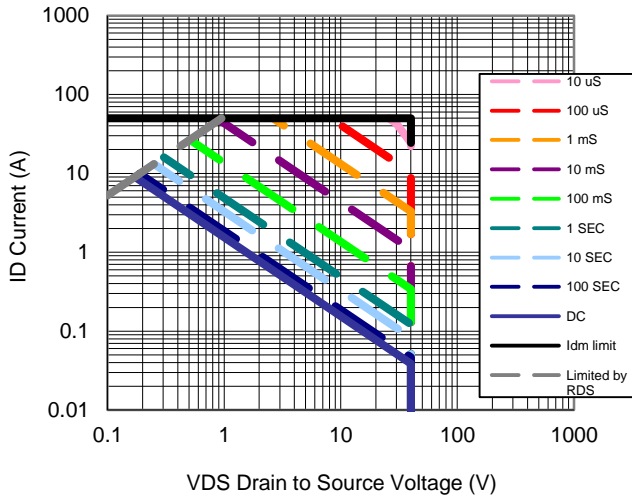
Typical Electrical Characteristics



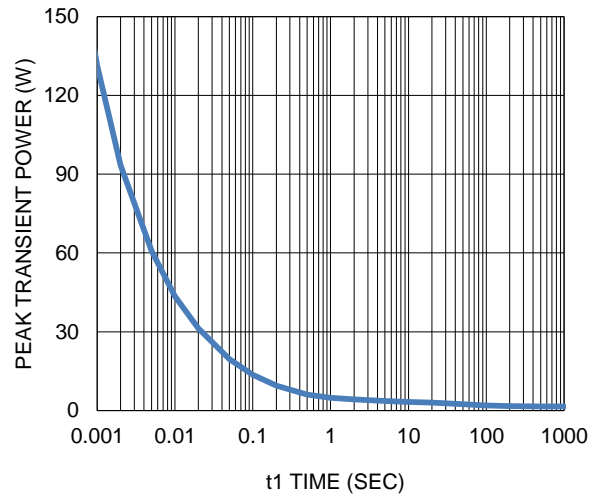
7. Gate Charge



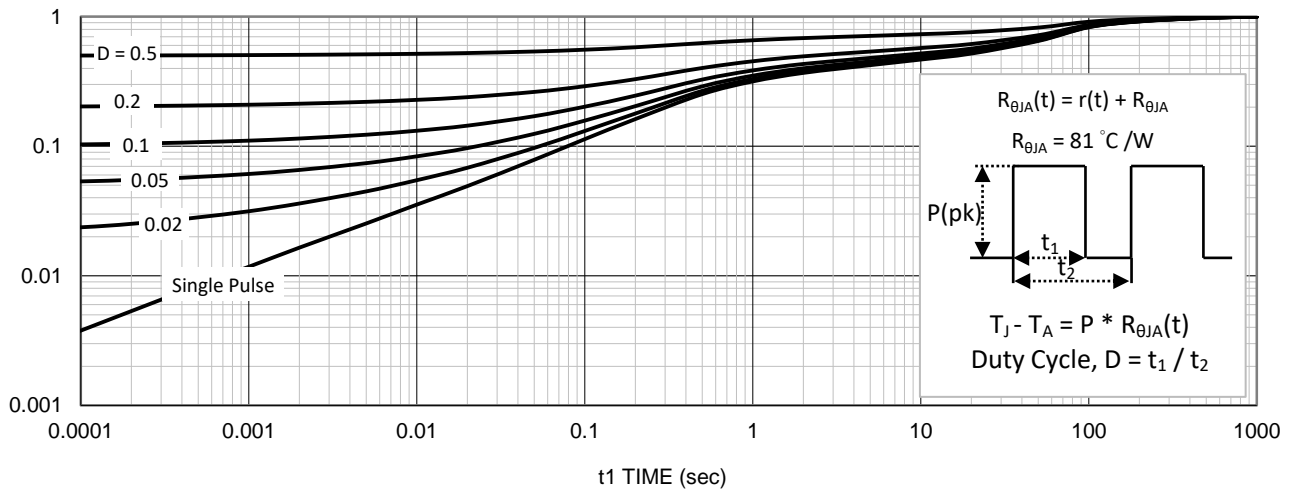
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

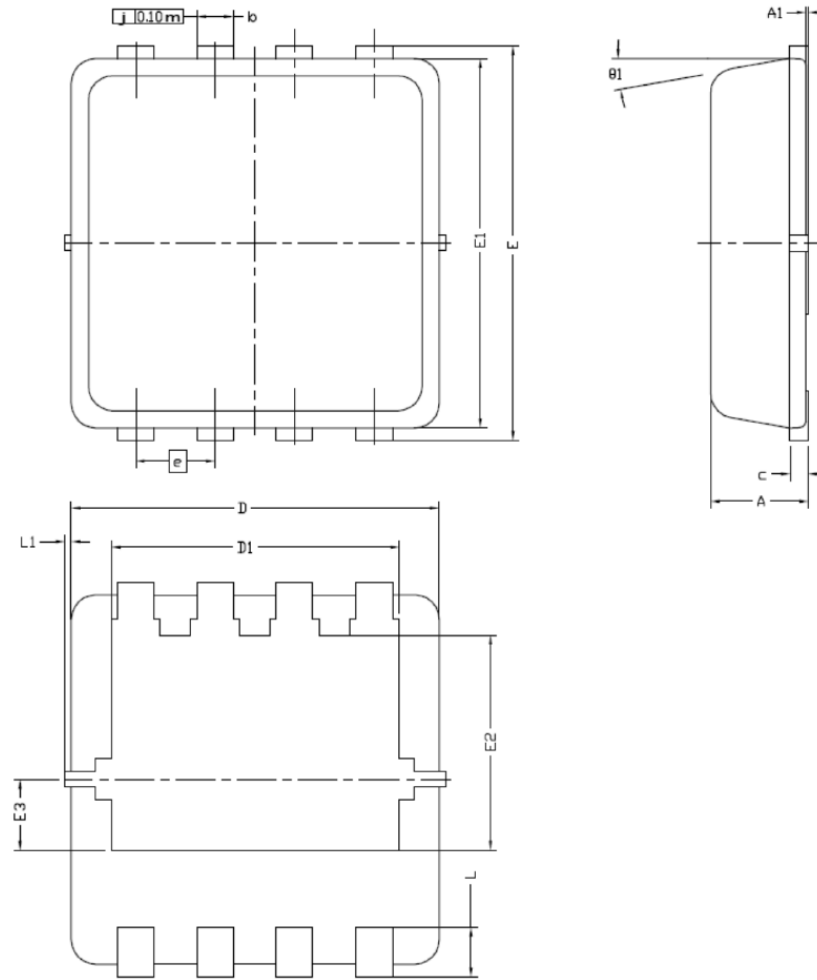


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



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	0,10	0,152	0,25	0,004	0,006	0,010
D	3,00 BSC			0,118 BSC		
D1	2,35 BSC			0,093 BSC		
E	3,20 BSC			0,126 BSC		
E1	3,00 BSC			0,118 BSC		
E2	1,75 BSC			0,069 BSC		
E3	0,575 BSC			0,023 BSC		
e	0,65 BSC			0,026 BSC		
L	0,30	0,40	0,50	0,0118	0,0157	0,0197
L1	0	---	0,100	0	---	0,004
$\theta1$	0°	10°	12°	0°	10°	12°