MS9N20E

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

Description

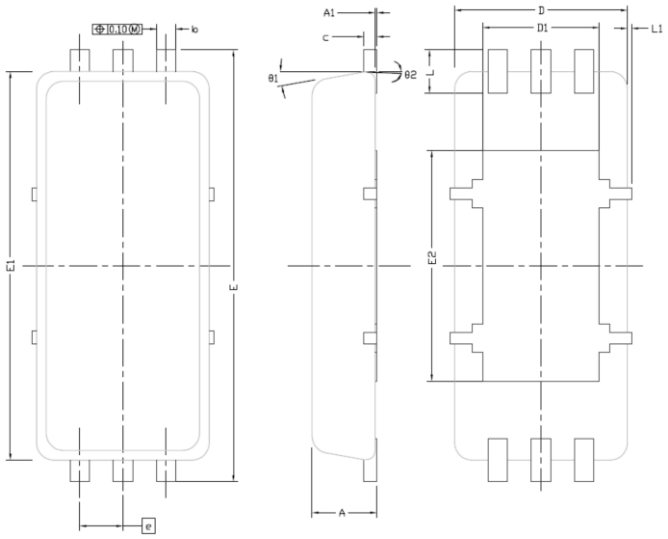
These miniature surface mount MOSFETs utilize a high cell density trench process to provide low rDS(on) and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

Features

- Low rDS(on) provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe
- DFN2X5 6PP saves board space
- Fast switching speed
- High performance trench technology

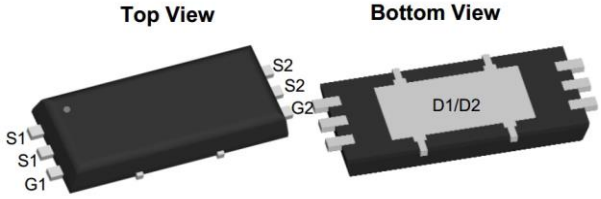
Packing & Order Information

3,000/Reel



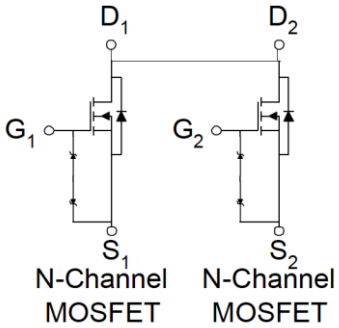
DIM.	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.0315
A1	0.00	---	0.05	0.000	---	0.002
b	0.20	0.225	0.30	0.008	0.009	0.012
c	0.10	0.152	0.20	0.004	0.006	0.008
D	2.00 BSC			0.079 BSC		
D1	1.30	1.35	1.55	0.051	0.053	0.061
E	5.00 BSC			0.197 BSC		
E1	4.50 BSC			0.177 BSC		
E2	2.60	2.67	2.95	0.102	0.105	0.116
e	0.50 BSC			0.020 BSC		
L	0.40	0.50	0.600	0.016	0.0197	0.0236
L1	0	---	0.100	0	---	0.004
θ1	0°	10°	12°	0°	10°	12°
θ2	3° BSC			3° BSC		

DFN 2X5



RoHS
COMPLIANT

Graphic symbol



MS9N20E

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

Absolute Maximum Ratings (Tc=25°C unless otherwise specified)			
Symbol	**Parameter**	**Value**	**Unit**
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Continuous Drain Current[a] (T_A =25°C)	11.0	A
	Continuous Drain Current$_a$ (T_A =70°C)	8.5	A
I_{DM}	Pulsed Drain Current[b]	±40	A
I_S	Continuous Source Current (Diode Conduction)[a]	3.1	A
P_D	Power Dissipation[a] (T_A =25°C)	3.5	W
	Power Dissipation[a] (T_A =70°C)	1.8	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	°C

Notes:

a. Surface Mounted on 1” x 1” FR4 Board.

b. Pulse width limited by maximum junction temperature

Thermal Characteristics (Tc=25°C unless otherwise specified)		
Parameter	**Maximum**	**Units**
Maximum Junction-to-Ambient[a] (t <= 10 sec)	62.5	°C/W
Maximum Junction-to-Ambient[a] (Steady-State)	80	

Static Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
V_{GS}	V_{DS} = V_{GS}, I_D = -250μA	0.5	--	--	V
I_{GSS}	V_{DS} = 0 V , V_{GS} = ±12 V	--	--	±100	nA
I_{DSS}	V_{DS} = 16 V , V_{GS} = 0 V V_{DS} = 16 V , V_{GS} = 0 V , T_J= 55°C	--	--	1 30	uA
$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 4.5 V	20	--	--	A
$r_{DS(on)}$	V_{DS} = 4.5 V, I_D = 6.7 A V_{DS} = 2.5 V, I_D = 4.5 A	--	--	22 28	mΩ
g_{fs}	V_{DS} = 15 V, I_D = 6 A	--	22	--	S
V_{SD}	I_S = 0.5 A , V_{GS} = 0 V	--	0.7	--	V

MS9N20E

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

Dynamic Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
Q_g	V_{DS} = 15 V , I_D = 6.0 A, V_{GS} = 4.5 V	--	9.2	--	nC
Q_{gs}		--	1.9	--	nC
Q_{gd}		--	2.8	--	nC
$t_{d(on)}$	V_{DD} = 10 V , R_L = 15 Ω, V_{GEN} = 4.5 V , I_D = 1 A	--	1.7	--	ns
t_r		--	2.3	--	ns
$t_{d(off)}$		--	1.1	--	ns
t_f		--	4.4	--	ns

Notes:

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

MS9N20E

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

■Characteristics Curve

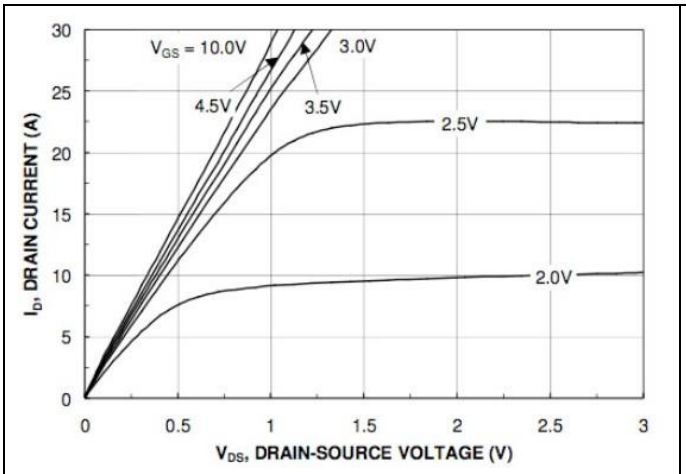


FIG.1-OUTPUT CHARACTERISTICS

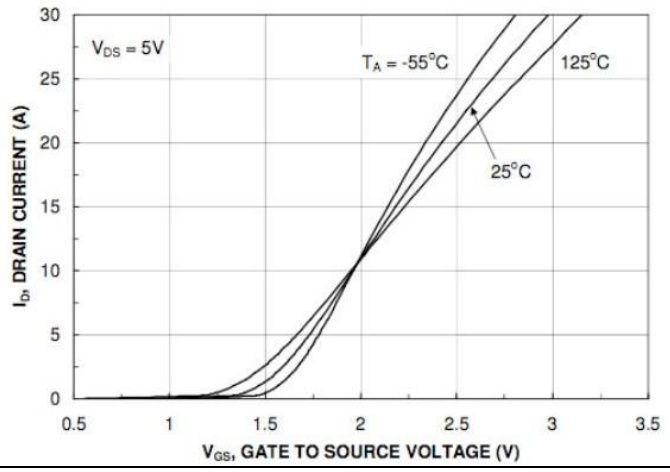


FIG.2-TRANSFER CHARACTERISTICS

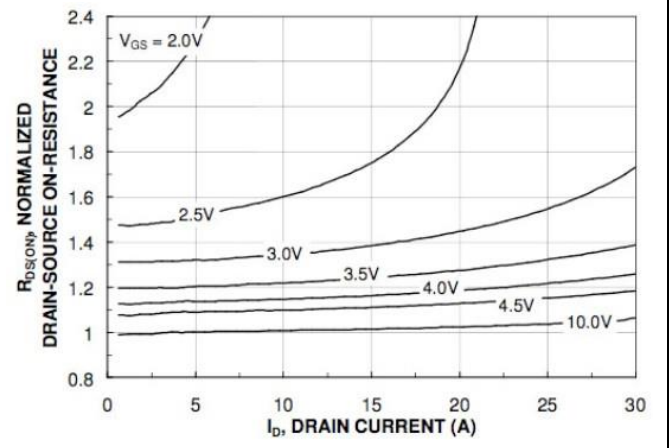


FIG.3-ON-RESISTANCE VS. DRAIN CURRENT

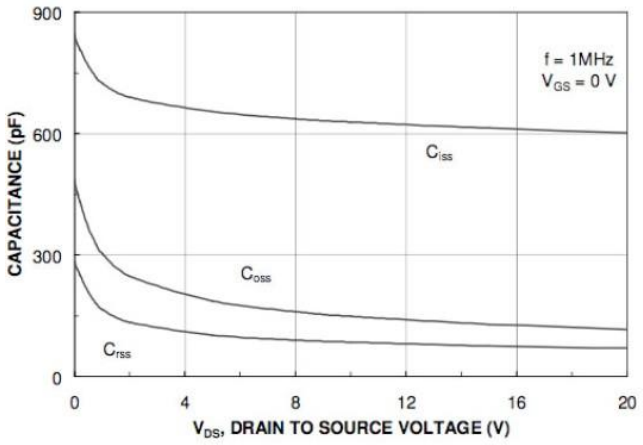


FIG.4-CAPACITANCE

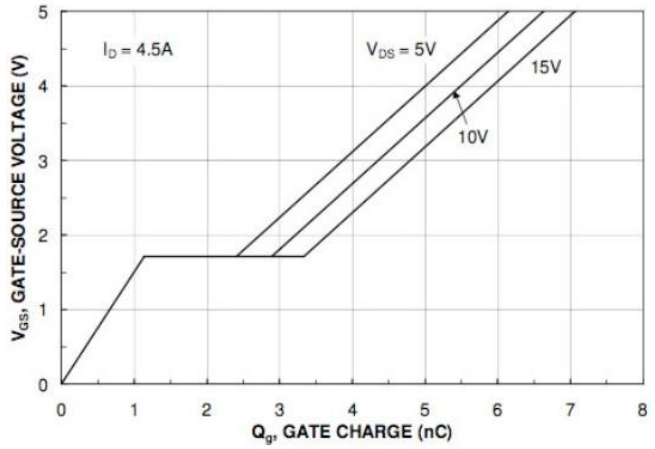


FIG.5-GATE CHARGE

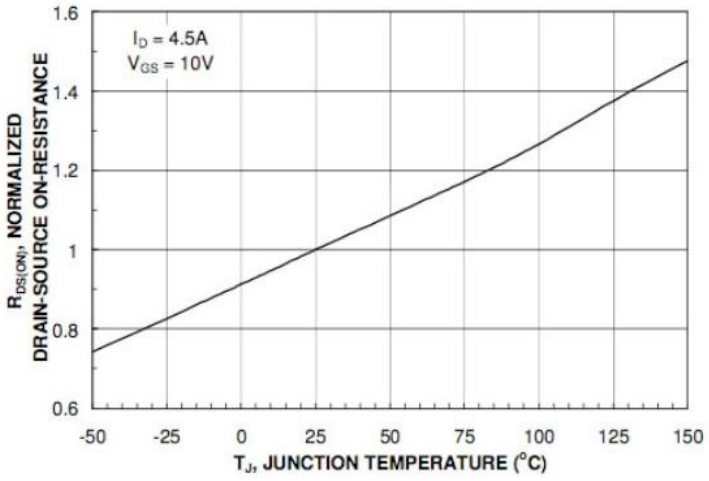


FIG.6-ON-RESISTANCE VS. JUNCTION TEMPERATURE

MS9N20E

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

■Characteristics Curve

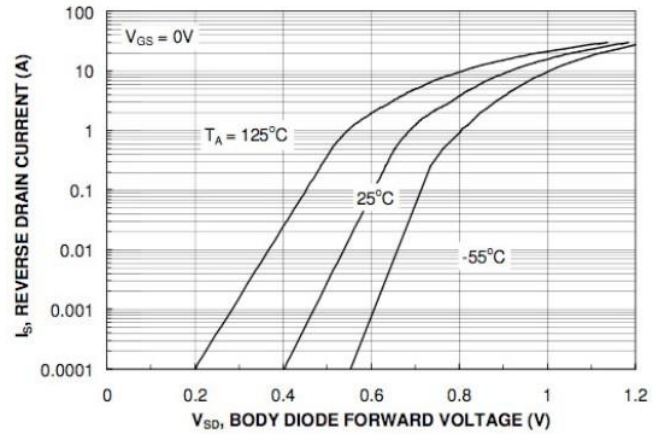


FIG.7-SOURCE-DRAIN DIODE FORWARD VOLTAGE

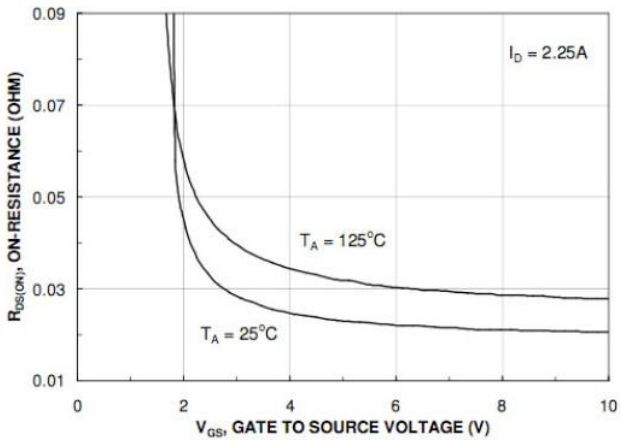


FIG.8-ON-RESISTANCE VS. GATE-TO-SOURCE VOLTAGE

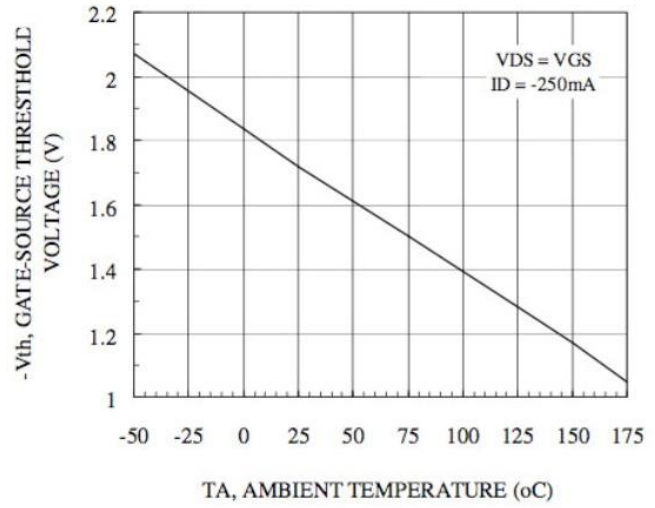


FIG.9-VTH GATE TO SOURCE VOLTAGE VS TEMPERATURE

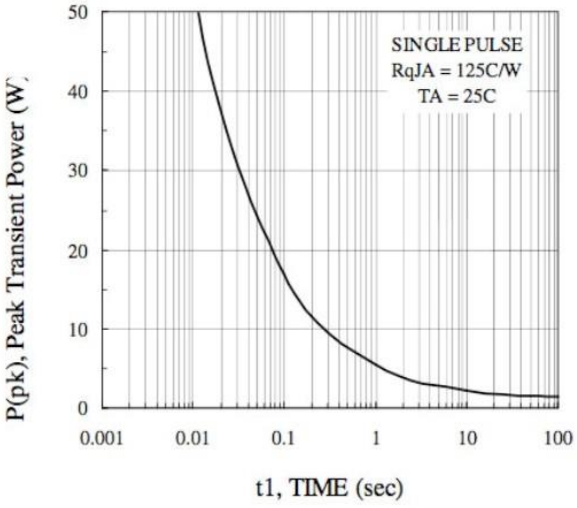


FIG.10-SINGLE PULSE POWER, JUNCTION-TO-AMBIENT

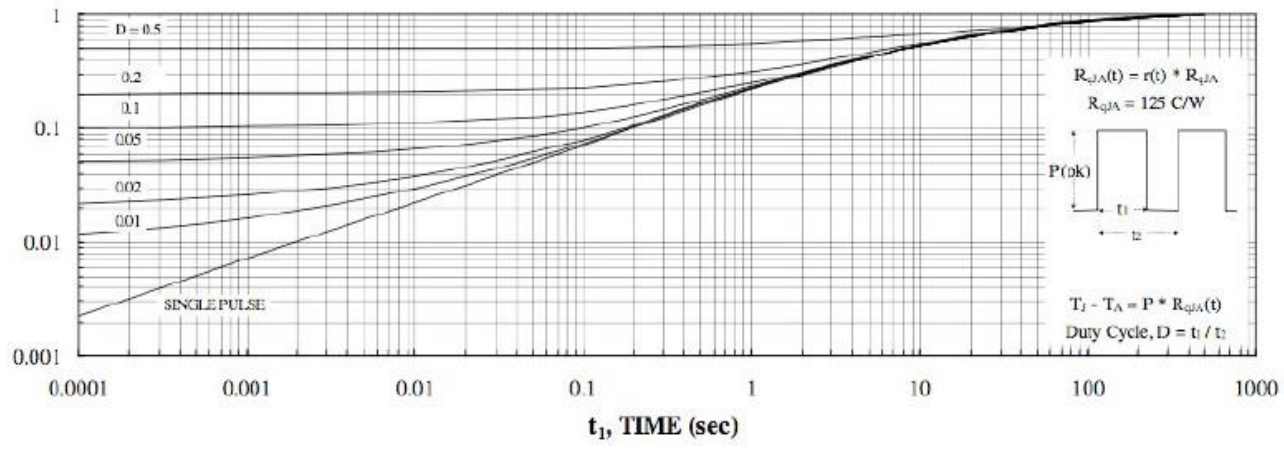


FIG.11-NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT

MS9N20E

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

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Bruckewell Technology Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Bruckewell”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Bruckewell makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Bruckewell disclaims

(i) Any and all liability arising out of the application or use of any product.

(ii) Any and all liability, including without limitation special, consequential or incidental damages.

(iii) Any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Bruckewell’s knowledge of typical requirements that are often placed on Bruckewell products in generic applications.

Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time.

Product specifications do not expand or otherwise modify Bruckewell’s terms and conditions of purchase, including but not limited to the warranty expressed therein.