MS69N68

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 lead frame TSSOP-8 saves board space

• Fast switching speed

• High performance trench technology

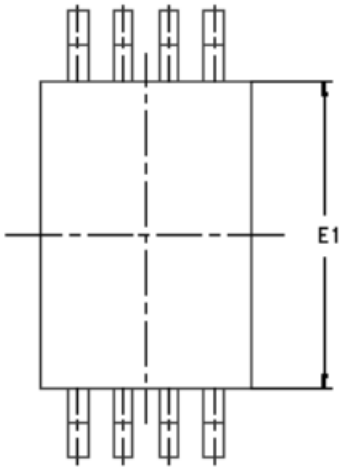
Typical Applications:

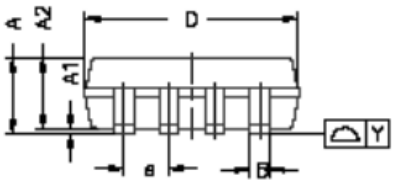
- Battery Powered Instruments
- Portable Computing
- Mobile Phones
- GPS Units and Media Players
- RoHS compliant package

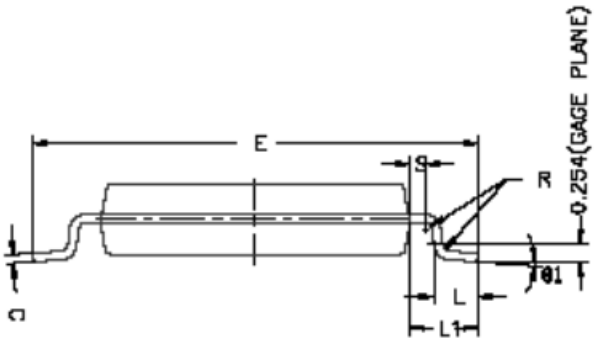
Package type：TSSOP-8

Packing & Order Information

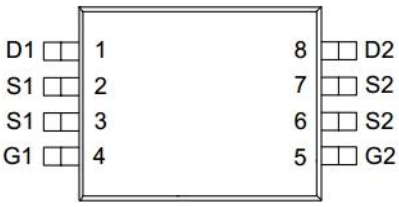
3,000/Reel





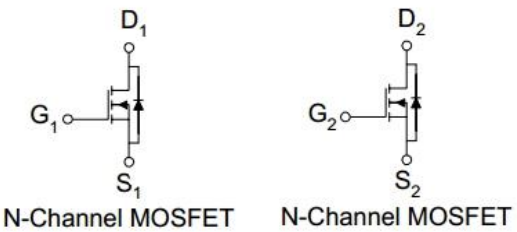


DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.05	1.10	1.20
A(1)	0.05	0.10	0.15
A(2)	0.99	1.02	1.05
B	0.19	0.25	0.30
C	--	0.127	--
D	2.90	3.00	3.10
E	6.20	6.40	6.60
E1	4.30	4.40	4.50
e	0.65BSC		
L	0.45	0.60	0.75
L1	0.90	1.00	1.10
Y	--	--	0.10
θ1	0°	4°	8°
R	0.09	--	--
S	0.20	--	--



RoHS
COMPLIANT

Graphic symbol



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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±8	V
I_D	Continuous Drain Current[a] (T_A=25°C)	6.8	A
	Continuous Drain Current[a] (T_A=70°C)	5.5	A
I_{DM}	Pulsed Drain Current[b]	30	A
I_S	Continuous Source Current (Diode Conduction)[a]	2.2	A
P_D	Power Dissipation[a] (T_A=25°C)	1.5	W
	Power Dissipation[a] (T_A=70°C)	1	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	°C

Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient[a] (t <= 10 sec)	83	°C/W
	Maximum Junction-to-Ambient[a] (Steady-State)	120	

Notes

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

b. Pulse width limited by maximum junction temperature

Static

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	0.4			V
I_{GSS}	Gate-Body Leakage	V_{DS} = 0 V , V_{GS} = ±8 V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 16 V , V_{GS} = 0 V V_{DS} = 16 V , V_{GS} = 0 V , T_J= 55°C			1 10	uA
$I_{D(on)}$	On-State Drain Current	V_{DS} = 5 V, V_{Gs} = 4.5 V	25			A
$r_{DS(on)}$	Drain-Source On-Resistance	V_{DS} = 4.5 V, I_D = 5.0 A V_{DS} = 2.5 V, I_D = 4.3 A V_{DS} = 1.8 V, I_D = 3.5 A			22 30 46	mΩ
g_{fs}	Forward Tranconductance	V_{GS} = 10 V, I_D = 5.0 A		25		S
V_{SD}	Diode Forward Voltage	I_S = 2.2 A , V_{GS} = 0 V		0.7		V

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Dynamic						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	V_{DS} = 10 V , I_D = 4.5 A, V_{GS} = 5.0 V	--	6.2	--	nC
Q_{gs}	Gate-Source Charge		--	1.0	--	nC
Q_{gd}	Gate-Drain Charge		--	1.9	--	nC
$t_{d(on)}$	Turn-On Delay Time	I_D = 5.0 A , R_L = 2.0 Ω, V_{GEN} = 10 V , R_{GEN} = 6 Ω V_{DD} = 10 V	--	12	--	ns
t_r	Rise Time		--	15	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	56	--	ns
tf	Fall Time		--	17	--	ns
C_{ISS}	Input Capacitance	V_{DS} = 10 V f = 1 MHz ,V_{GS} = 0 V	--	479	--	pF
C_{OSS}	Output Capacitance		--	72	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	58	--	pF

Notes

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

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

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■Typical Electrical Characteristics

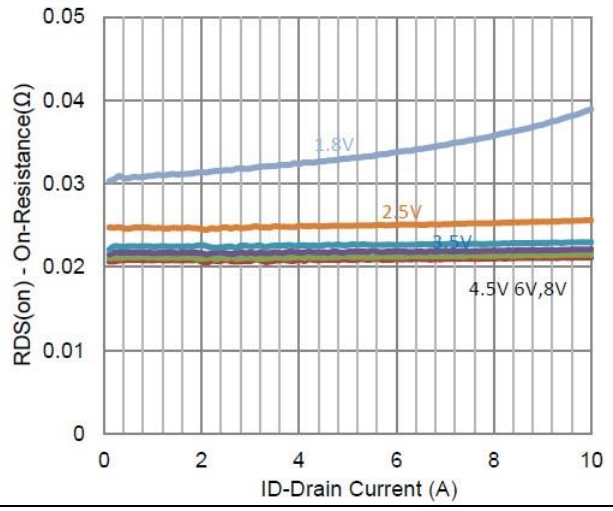

FIG.1-ON REGION CHARACTERISTICS

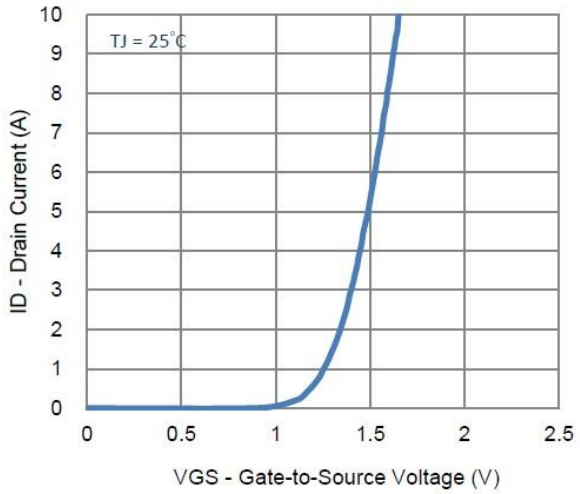

FIG.2-TRANSFER CHARACTERISTICS

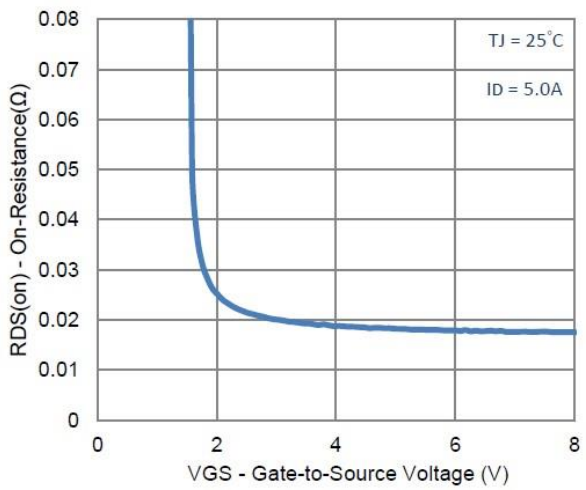

FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

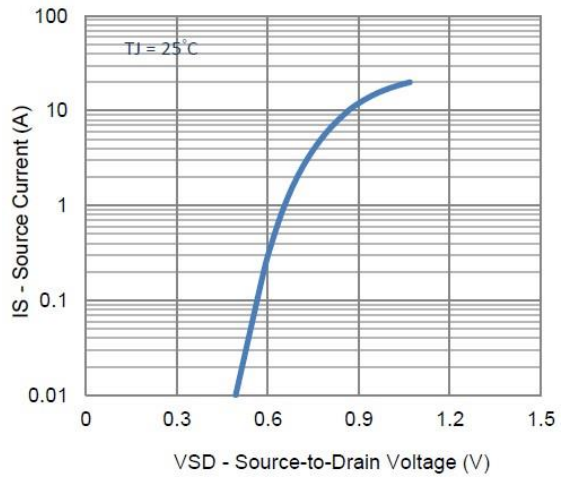

FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

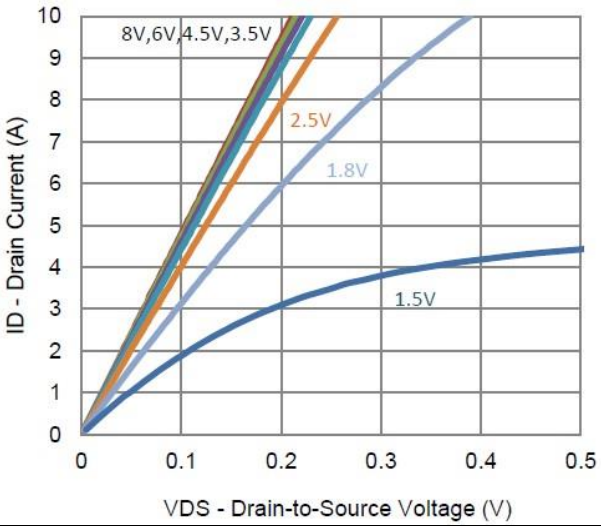

FIG.5-CAPACITANCE CHARACTERISTICS

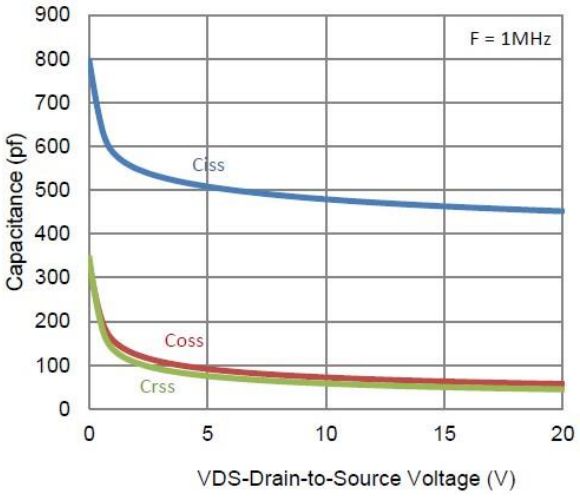

FIG.6-GATE CHARGE CHARACTERISTICS

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■Typical Electrical Characteristics

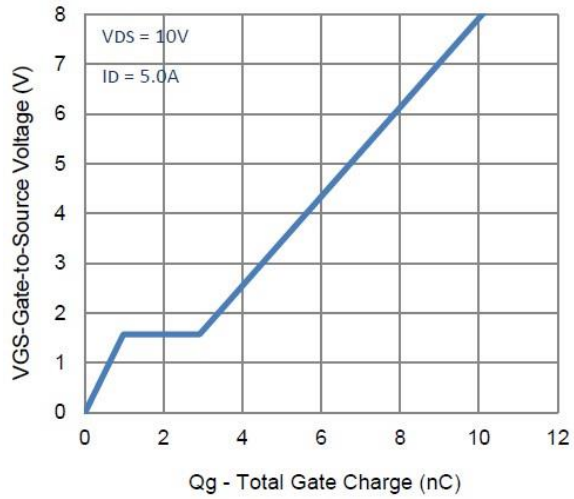

FIG.7-BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

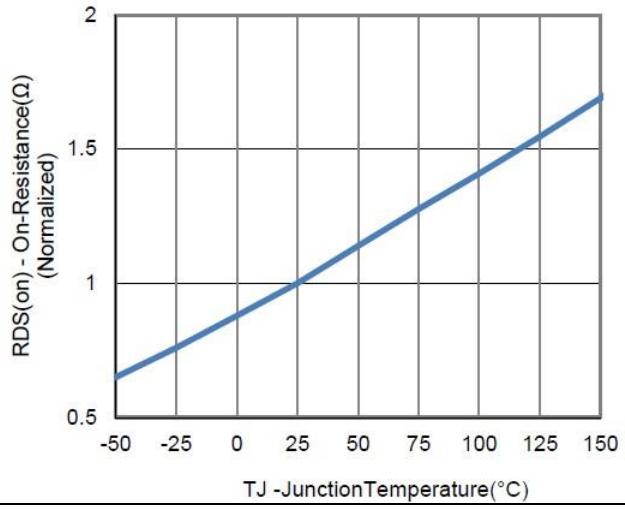

FIG.8-ON-RESISTANCE VARIATION VS TEMPERATURE

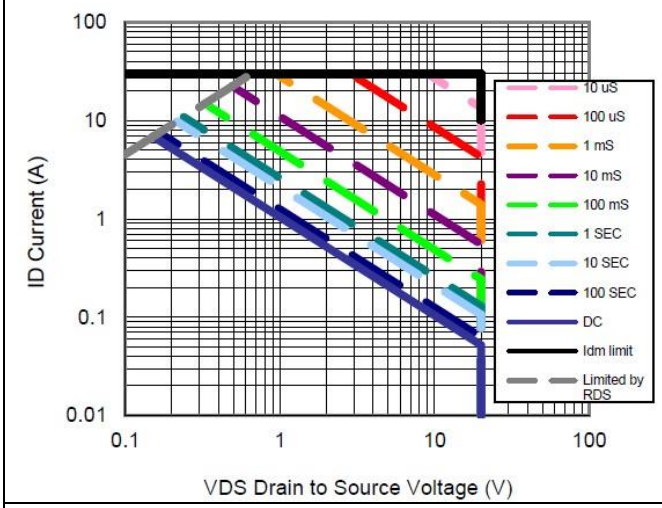

FIG.9-MAXIMUM SAFE OPERATING AREA

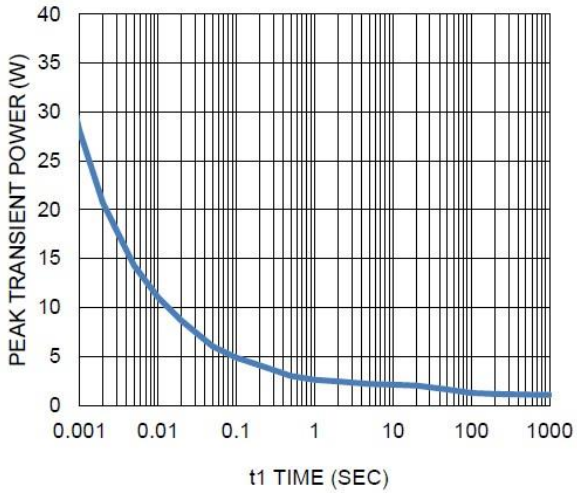

FIG.10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

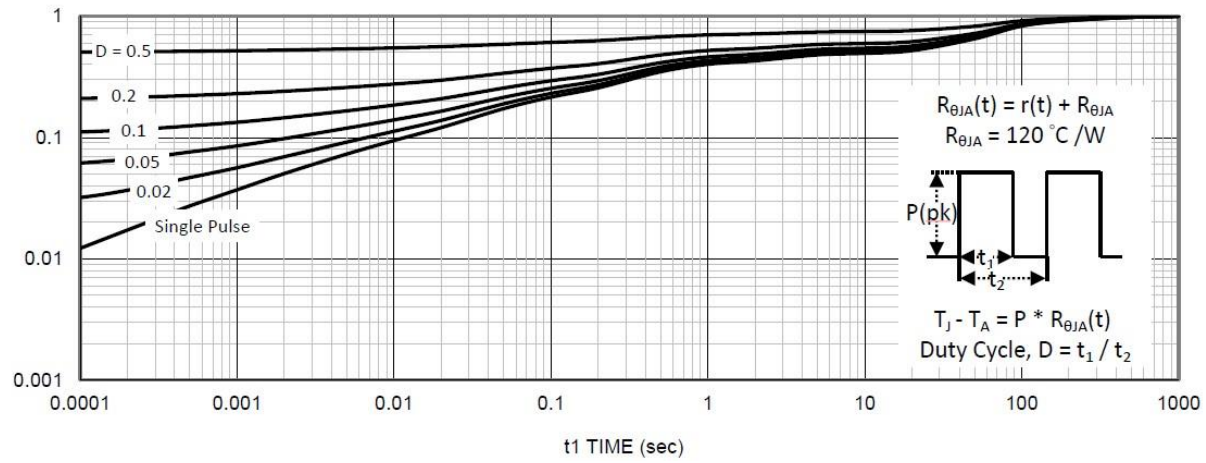

FIG.11-TRANSIENT THERMAL RESPONSE CURVE

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