

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 $r_{DS(on)}$ 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 $r_{DS(on)}$ 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

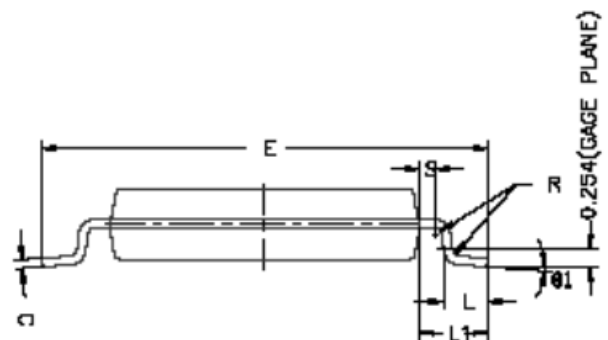
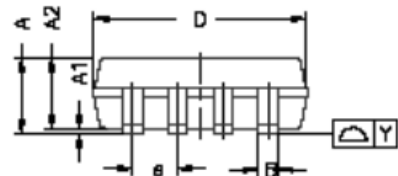
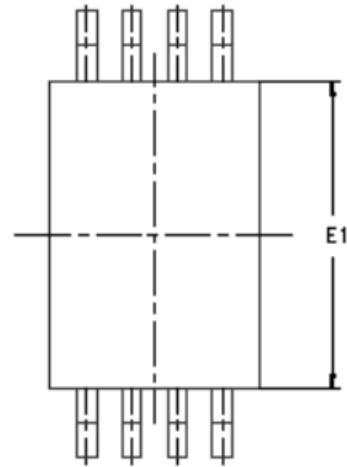
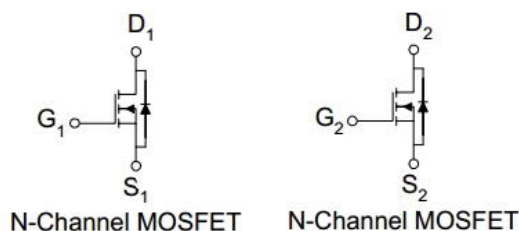
Packing & Order Information

3,000/Reel



**RoHS
COMPLIANT**

Graphic symbol



DIM.	MILLIMETERS		
	MIN.	NDM.	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
a	0.65BSC		
L	0.45	0.60	0.75
L1	0.90	1.00	1.10
Y	---	---	0.10
Ø1	D	F	F
R	0.09	---	---
S	0.20	---	---

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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ 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 ($T_A=25^\circ\text{C}$)	6.8	A
	Continuous Drain Current ^a ($T_A=70^\circ\text{C}$)	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 ($T_A=25^\circ\text{C}$)	1.5	W
	Power Dissipation ^a ($T_A=70^\circ\text{C}$)	1	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	$^\circ\text{C}$

Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ^a ($t \leq 10$ sec)	83	$^\circ\text{C/W}$
	Maximum Junction-to-Ambient ^a (Steady-State)	120	

Notes

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

Static

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = -250\mu\text{A}$	0.4			V
I_{GSS}	Gate-Body Leakage	$V_{DS} = 0$ V, $V_{GS} = \pm 8$ 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, $T_J = 55^\circ\text{C}$			1 10	μA
$I_{D(on)}$	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	$\text{m}\Omega$
g_{fs}	Forward Transconductance	$V_{GS} = 10$ 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	$V_{DS} = 10\text{ V}$, $I_D = 4.5\text{ A}$, $V_{GS} = 5.0\text{ V}$	--	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	$I_D = 5.0\text{ A}$, $R_L = 2.0\ \Omega$, $V_{GEN} = 10\text{ V}$, $R_{GEN} = 6\ \Omega$, $V_{DD} = 10\text{ V}$	--	12	--	ns
t_r	Rise Time		--	15	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	56	--	ns
t_f	Fall Time		--	17	--	ns
C_{ISS}	Input Capacitance	$V_{DS} = 10\text{ V}$, $f = 1\text{ MHz}$, $V_{GS} = 0\text{ V}$	--	479	--	pF
C_{OSS}	Output Capacitance		--	72	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	58	--	pF

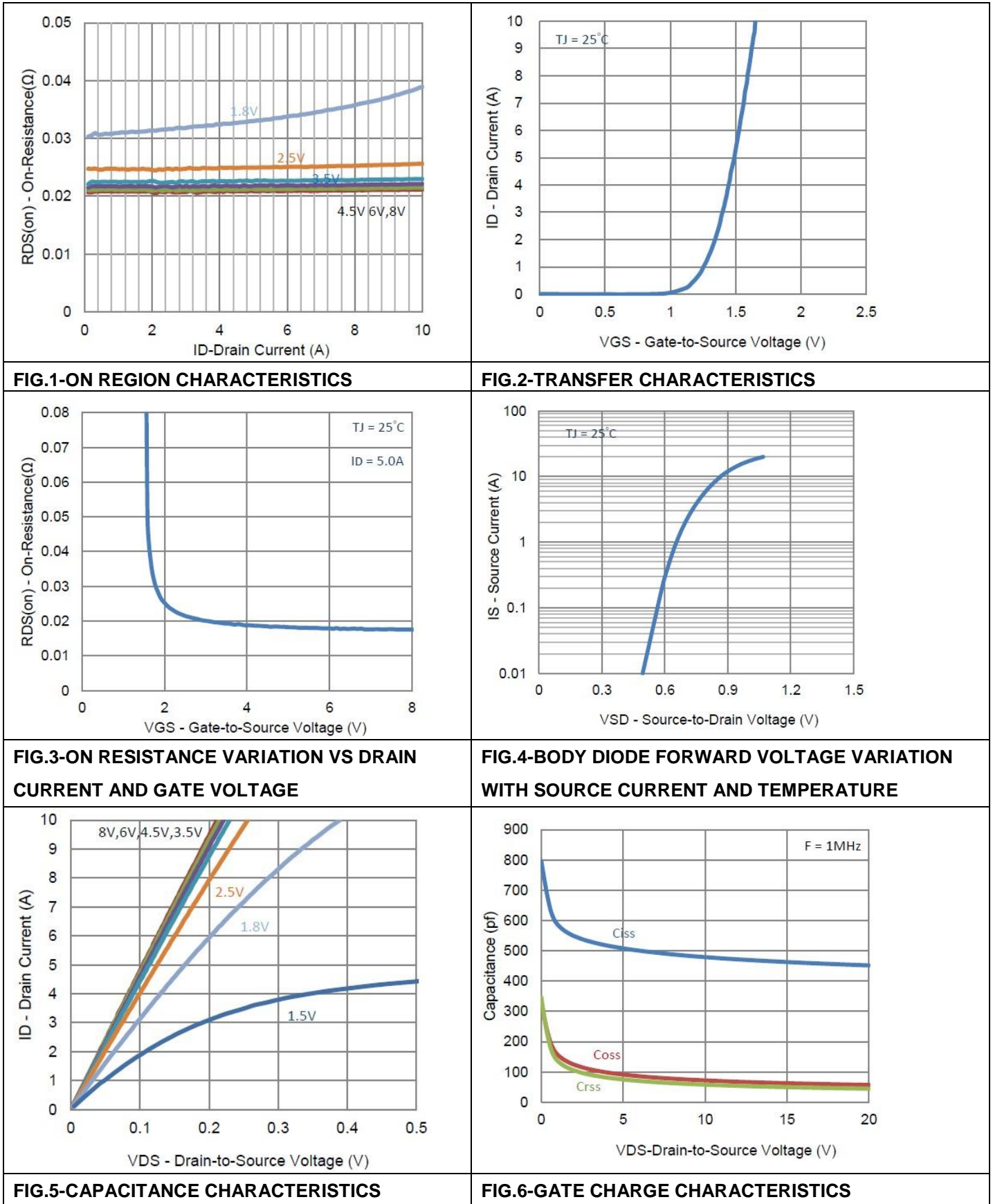
Notes

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

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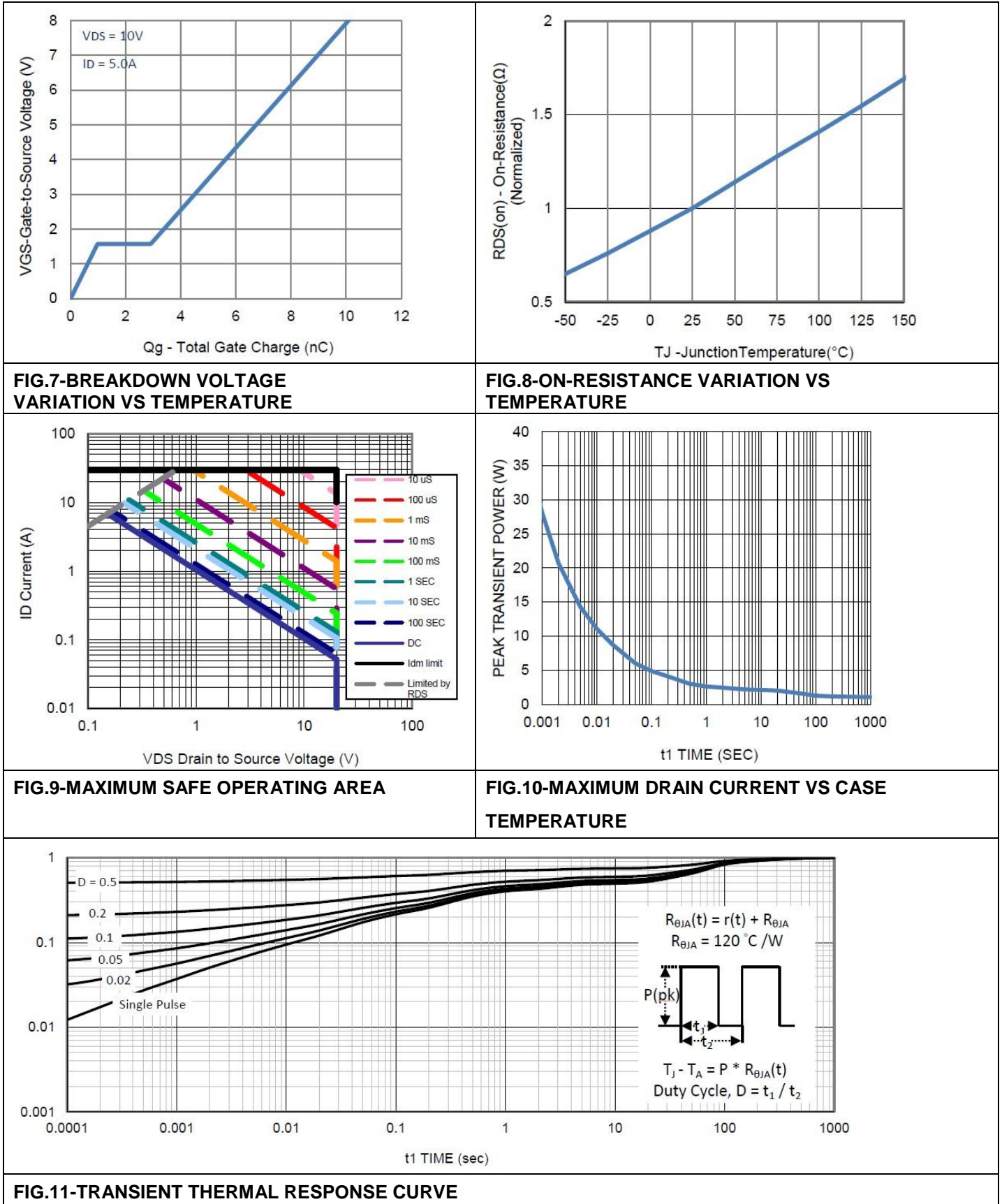
Typical Electrical Characteristics



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