

MSQ6N30

Dual N-Channel 30-V (D-S) MOSFET

Feature

- Low RDS(on) trench technology
- Low thermal impedance
- Fast switching speed
- RoHS compliant package

Application

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

Package type : SO-8

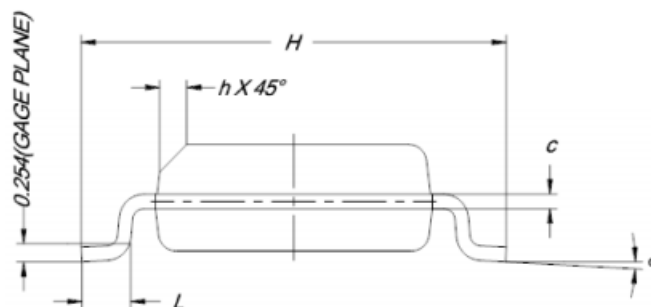
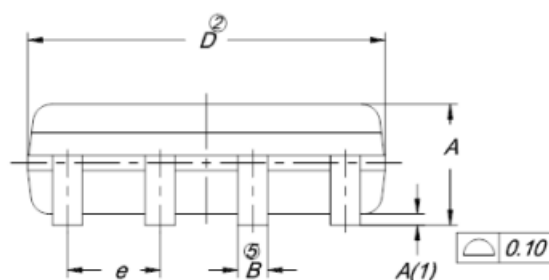
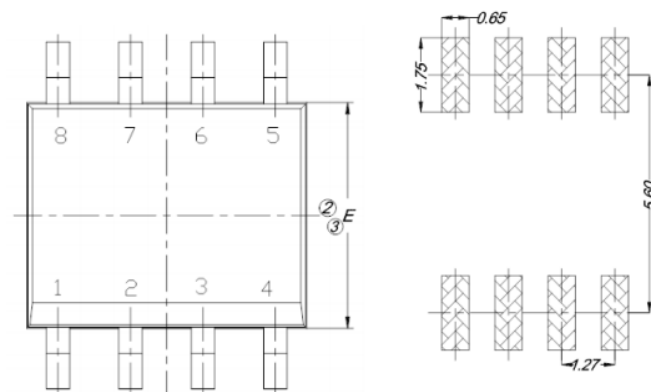
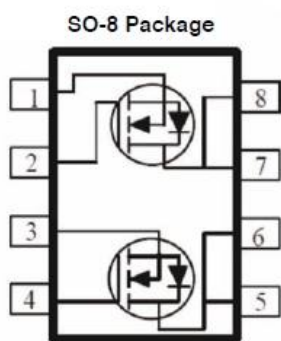
Package & Order Information

3,000/Reel



**RoHS
COMPLIANT**

Graphic symbol



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.35	1.55	1.75
A(1)	0.10	0.18	0.25
B	0.38	0.45	0.51
C	0.19	0.22	0.25
D	4.80	4.90	5.00
E	3.80	3.90	4.00
e	1.27 BSC		
H	5.80	6.00	6.20
L	0.50	0.72	0.93
α	0°	4°	8°
h	0.25	0.38	0.50

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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current -Continuous ($T_A=25^\circ\text{C}$)	6.4	A
	Drain Current -Continuous ($T_A=70^\circ\text{C}$)	5	A
I_{DM}	Drain Current Pulsed	20	A
I_S	Continuous Source Current (Diode Conduction) ^a	2.6	A
P_D	Power Dissipation ^a ($T_A=25^\circ\text{C}$)	2.1	W
	Power Dissipation ^a ($T_A=70^\circ\text{C}$)	1.3	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Resistance Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ^a ($t \leq 10$ sec)	62.5	$^\circ\text{C/W}$
	Maximum Junction-to-Ambient ^a (Steady State)	110	

Notes

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

Static

Symbol	Test Conditions	Min	Typ.	Max.	Units
$V_{GS(th)}$	$V_{GS} = V_{DS}$, $I_D = 250\mu\text{A}$	1	--	--	V
$r_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 5\text{ A}$	--	--	34	m Ω
	$V_{GS} = 4.5\text{ V}$, $I_D = 4.4\text{ A}$	--	--	41	
I_{DSS}	$V_{DS} = 24\text{ V}$, $V_{GS} = 0\text{ V}$	--	--	1	μA
	$V_{DS} = 24\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55^\circ\text{C}$	--	--	10	
I_{GSS}	$V_{GS} = \pm 20\text{ V}$, $V_{DS} = 0\text{ V}$	--	--	± 100	nA
$I_{D(on)}$	$V_{GS} = 10\text{ V}$, $V_{DS} = 5\text{ V}$	20	--	--	A
V_{SD}	$V_{GS} = 0\text{ V}$, $I_S = 1.3\text{ A}$	--	0.77	--	V
G_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 5\text{ A}$	--	20	--	S

Dynamic Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
C_{ISS}	$V_{DS} = 15\text{ V}$, $V_{GS} = 0\text{ V}$, $F = 1.0\text{ MHz}$	--	327	--	pF
C_{OSS}		--	65	--	pF
C_{RSS}		--	49	--	pF

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Dynamic Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	$V_{DD} = 15\text{ V}, I_D = 5\text{ A}, R_L = 3\ \Omega$ $R_{GEN} = 6\ \Omega, V_{GEN} = 10\text{ V}$	--	1.9	--	ns
t_r		--	4	--	ns
$t_{d(off)}$		--	13	--	ns
t_f		--	6	--	ns
Q_g	$V_{DS} = 15\text{ V}, I_D = 5\text{ A},$ $V_{GS} = 4.5\text{ V}$	--	3.8	--	nC
Q_{gs}		--	1.3	--	nC
Q_{gd}		--	2.0	--	nC

Notes

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

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Characteristics Curve

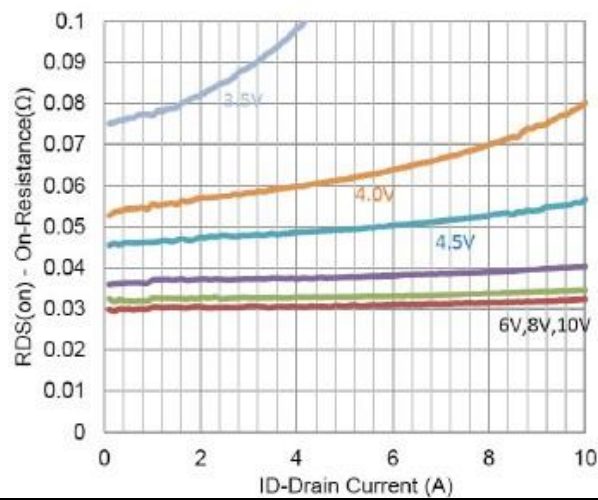


FIG.1-ON REGION CHARACTERISTICS

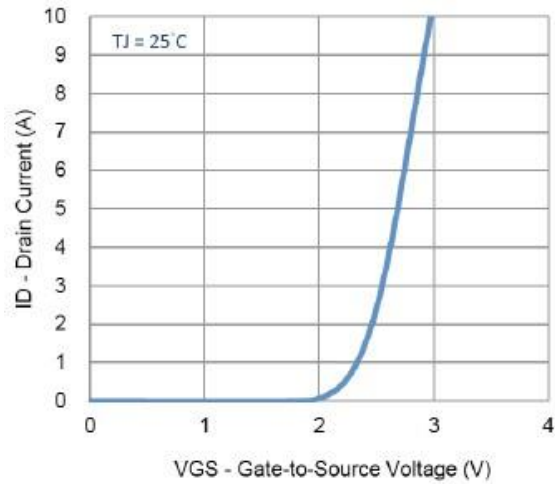


FIG.2-TRANSFER CHARACTERISTICS

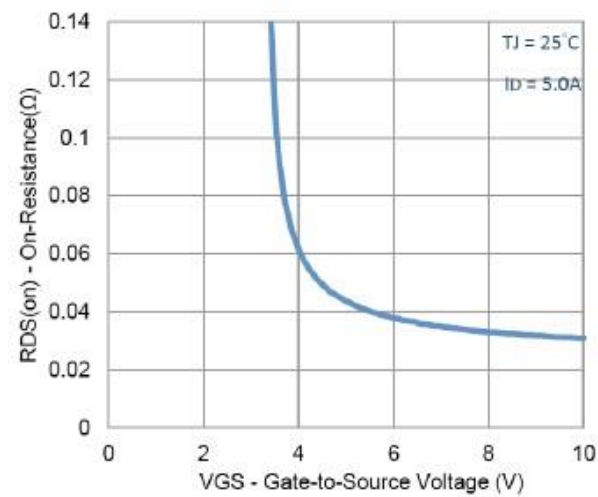


FIG.3-ON-RESISTANCE VS GATE-TO-SOURCE VOLTAGE

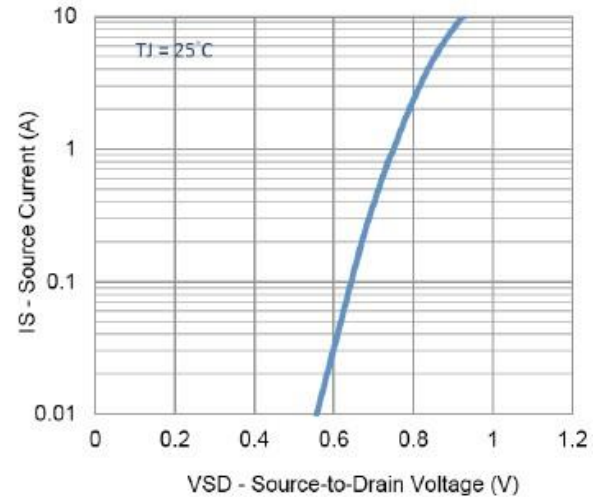


FIG.4-DRAIN-TO-SOURCE FORWARD VOLTAGE

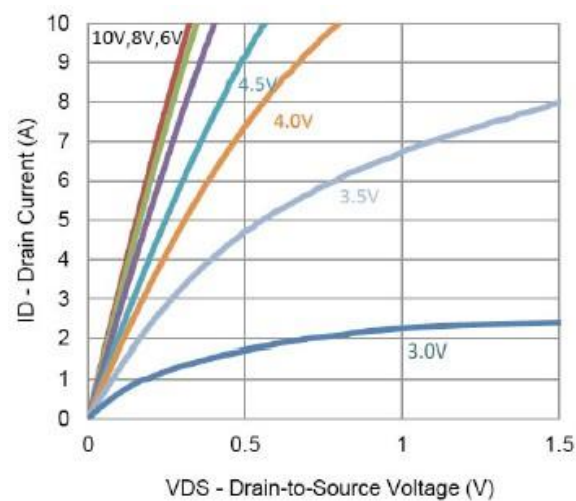


FIG.5-OUTPUT CHARACTERISTICS

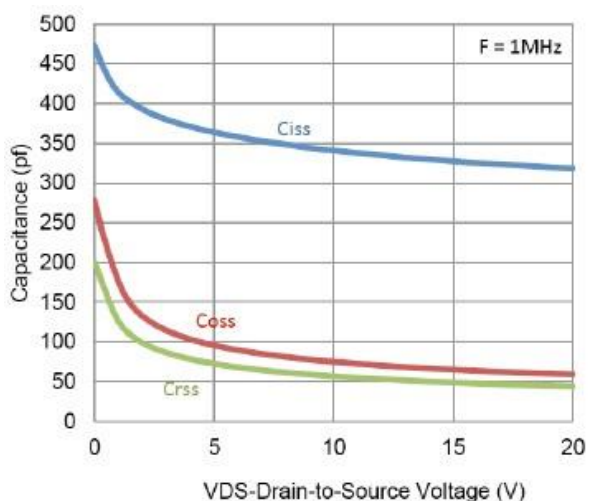


FIG.6-CAPACITANCE CHARACTERISTICS

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Characteristics Curve

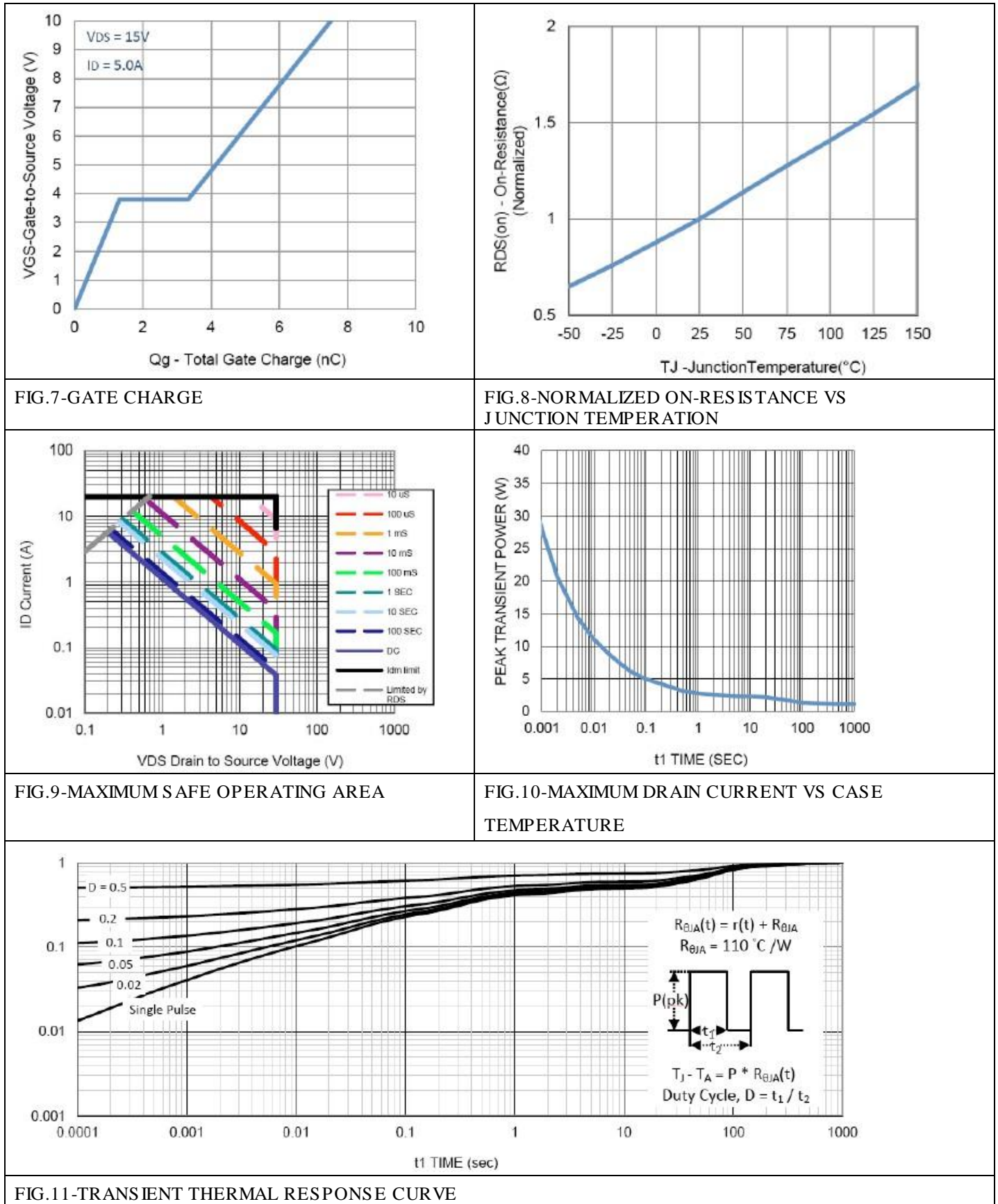


FIG.11-TRANSIENT THERMAL RESPONSE CURVE

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