

MSQ6N40

N-Channel Enhancement Mode Power MOSFET

Description

The MSQ6N40 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The QFN-5X6 package which has been designed to achieve very low on-state resistance providing also one of the best-in-class figure of merit (FOM)

Features

- BV_{DSS}=400V typically @ T_j=150°C
- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

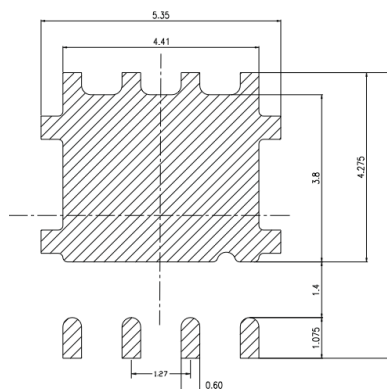
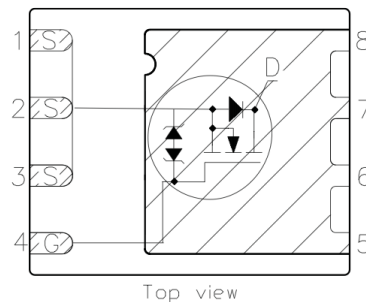
Application

- Open Framed Power Supply
- Adapter
- STB

Package type : QFN5X6

Packing & Order Information

3,000/Reel



RoHS
COMPLIANT

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (T_c=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{DSS}	Drain-Source Voltage	400	V
V _{GS}	Gate-Source Voltage	±30	V
I _D	Drain Current -Continuous (T _C =25°C)	5.5	A
	Drain Current -Continuous (T _C =100°C)	3.5	A
I _{DM}	Drain Current Pulsed	16.4	A
E _{AS}	Single Pulsed Avalanche Energy	240	mJ
E _{AR}	Repetitive Avalanche Energy	10	mJ

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Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
dv/dt	Peak Diode Recovery dv/dt	5.5	V/ns
P _D	Power Dissipation (TC = 25 °C)	38	W
	- Derate above 25°C	0.3	W/°C
T _{STG}	Operating and Storage Temperature	-55 to +150	°C
T _J	Storage Temperature	150	°C
T _L	Maximum Temperature for Soldering @ Lead at 0.125 in(0.318mm) from case for 10 seconds	300	°C
TPKG	Maximum Temperature for Soldering @ Package Body for 10 seconds	260	°C

NOTE:

1. Repetitive rating; pulse width limited by maximum junction temperature.

Thermal Resistance Characteristics

Symbol	Parameter	Value	Units
R _{θC}	Typical thermal resistance, , Junction-to-Case	3.3	°C/W
R _{θA}	Typical thermal resistance, , Junction-to-Ambient	62.5	

Static Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
BV _{DSS}	V _{GS} = 0 V , I _D = 250μA	400	--	--	V
ΔBV _{DSS} / ΔT _J	I _D = 250μA, Referenced to 25°C	--	0.6	--	
I _{DSS}	V _{DS} = 400 V , V _{GS} = 0 V V _{DS} = 320 V , V _{GS} = 0 V , T _J = 125°C	--	--	1 10	μA
I _{GSSF}	V _{GS} = 30 V , V _{DS} = 0 V	--	--	100	nA
I _{GSSR}	V _{GS} = -30 V , V _{DS} = 0 V	--	--	-100	nA
V _{GS}	V _{DS} = V _{GS} , I _D = 250μA	2.0	--	4.0	V
*R _{DS(ON)}	V _{GS} = 10 V , I _D = 2.75 A	--	0.8	1.0	Ω

Dynamic Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
t _{d(on)}	V _{DS} = 200 V , I _D = 5.5 A, R _G = 25 Ω	--	20	50	ns
t _r		--	50	110	ns
t _{d(off)}		--	90	190	ns
t _f		--	55	120	ns

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Dynamic Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
C_{ISS}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $F = 1.0\text{ MHz}$	--	670	870	pF
C_{OSS}		--	95	125	pF
C_{RSS}		--	16	21	pF
Q_g	$V_{DS} = 320\text{ V}, I_D = 5.5\text{ A},$ $V_{GS} = 10\text{ V}$	--	25	33	nC
Q_{gs}		--	5.0	--	nC
Q_{gd}		--	10	--	nC

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
I_S			--	--	5.5	A
I_{SM}			--	--	22	
V_{SD}	$I_S = 5.5\text{ A}, V_{GS} = 0\text{ V}$		--	--	1.5	V
t_{rr}	$I_S = 5.5\text{ A}, V_{GS} = 0\text{ V}$ $di/dt = 100\text{ A}/\mu\text{s}$		--	220	--	ns
Q_{rr}			--	2	--	nC

Notes ;

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $I_{AS}=5.5\text{ A}, V_{DD}=50\text{ V}, R_G=25\text{ W},$ Starting $T_J = 25^\circ\text{C}$
3. $I_{SD}\leq 5.5\text{ A}, di/dt\leq 300\text{ A}/\mu\text{s}, V_{DD}\leq BVDSS,$ Starting $T_J = 25^\circ\text{C}$
4. Pulse Test : Pulse Width $\leq 300\mu\text{s},$ Duty Cycle $\leq 2\%$
5. Essentially Independent of Operating Temperature

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Characteristics Curve

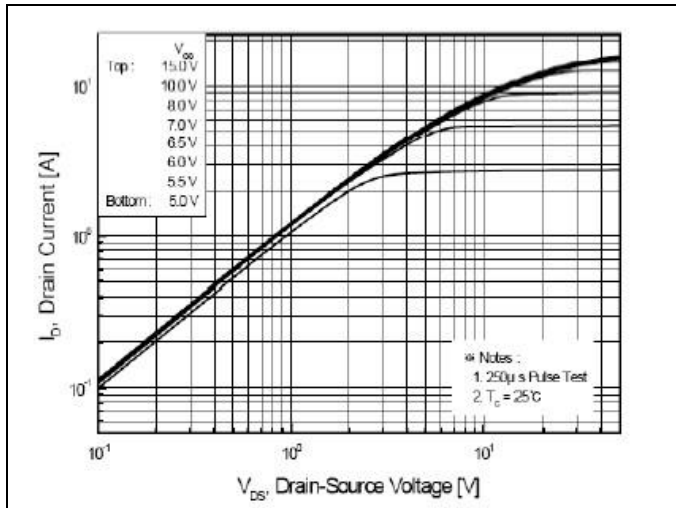


FIG.1-ON REGION CHARACTERISTICS

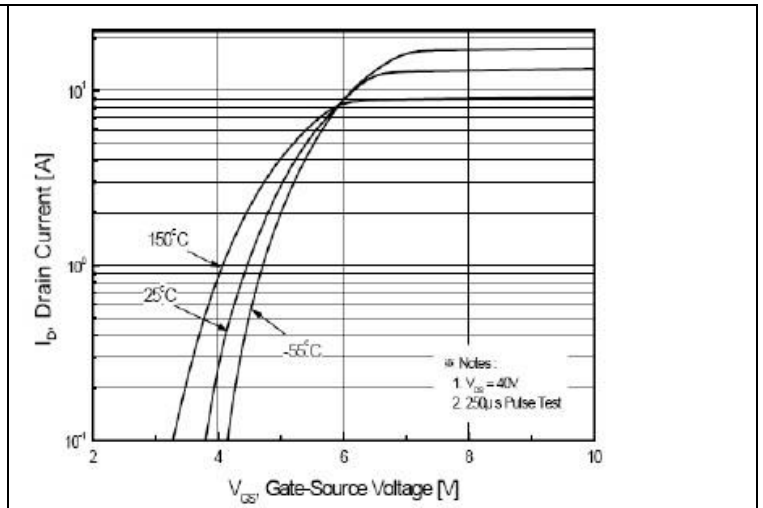


FIG.2-TRANSFER CHARACTERISTICS

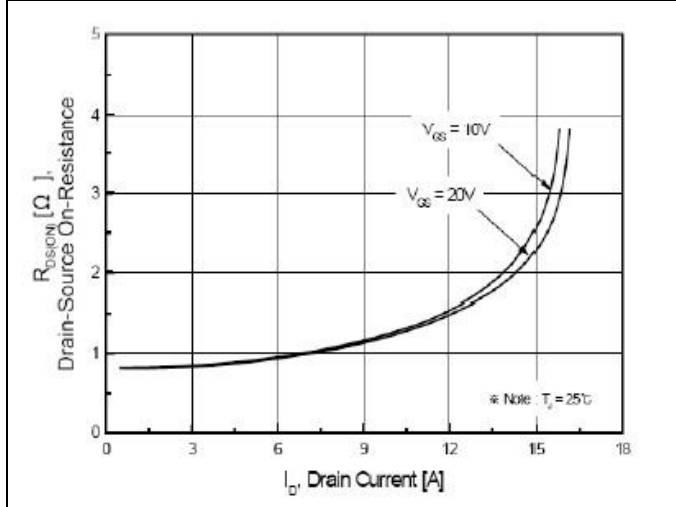


FIG.3-ON-RESISTANCE VS DRAIN CURRENT AND GATE VOLTAGE

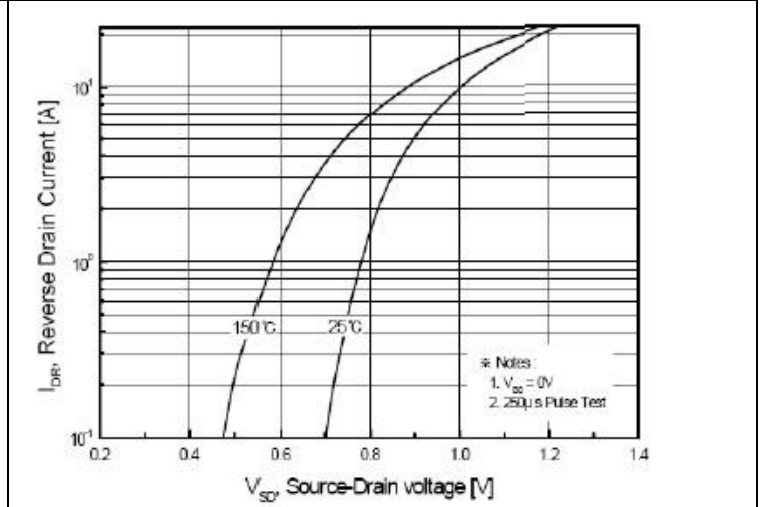


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

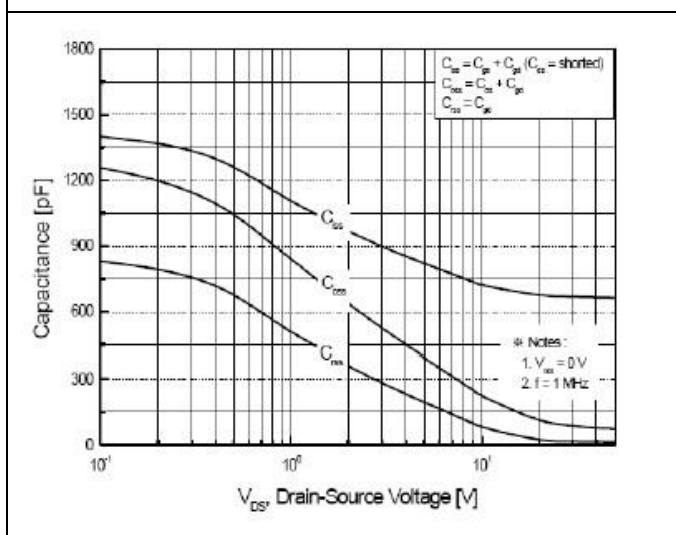


FIG.5-CAPACITANCE CHARACTERISTICS

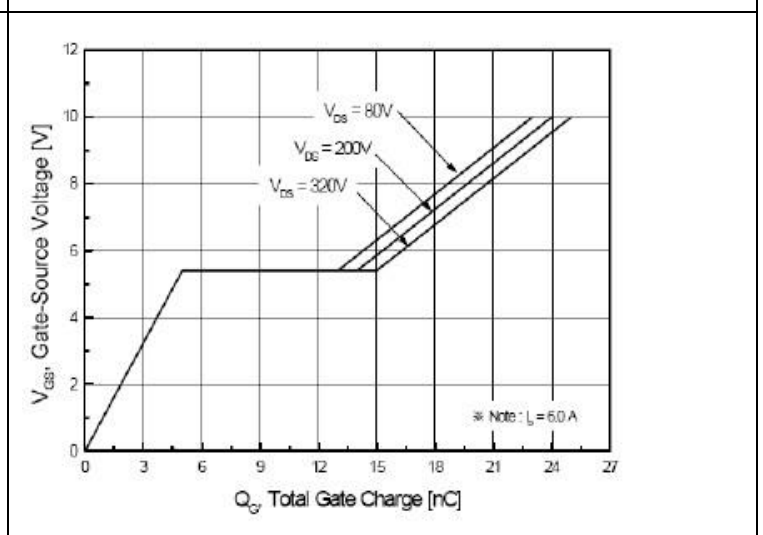


FIG.6-GATE CHARGE CHARACTERISTICS

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Characteristics Curve

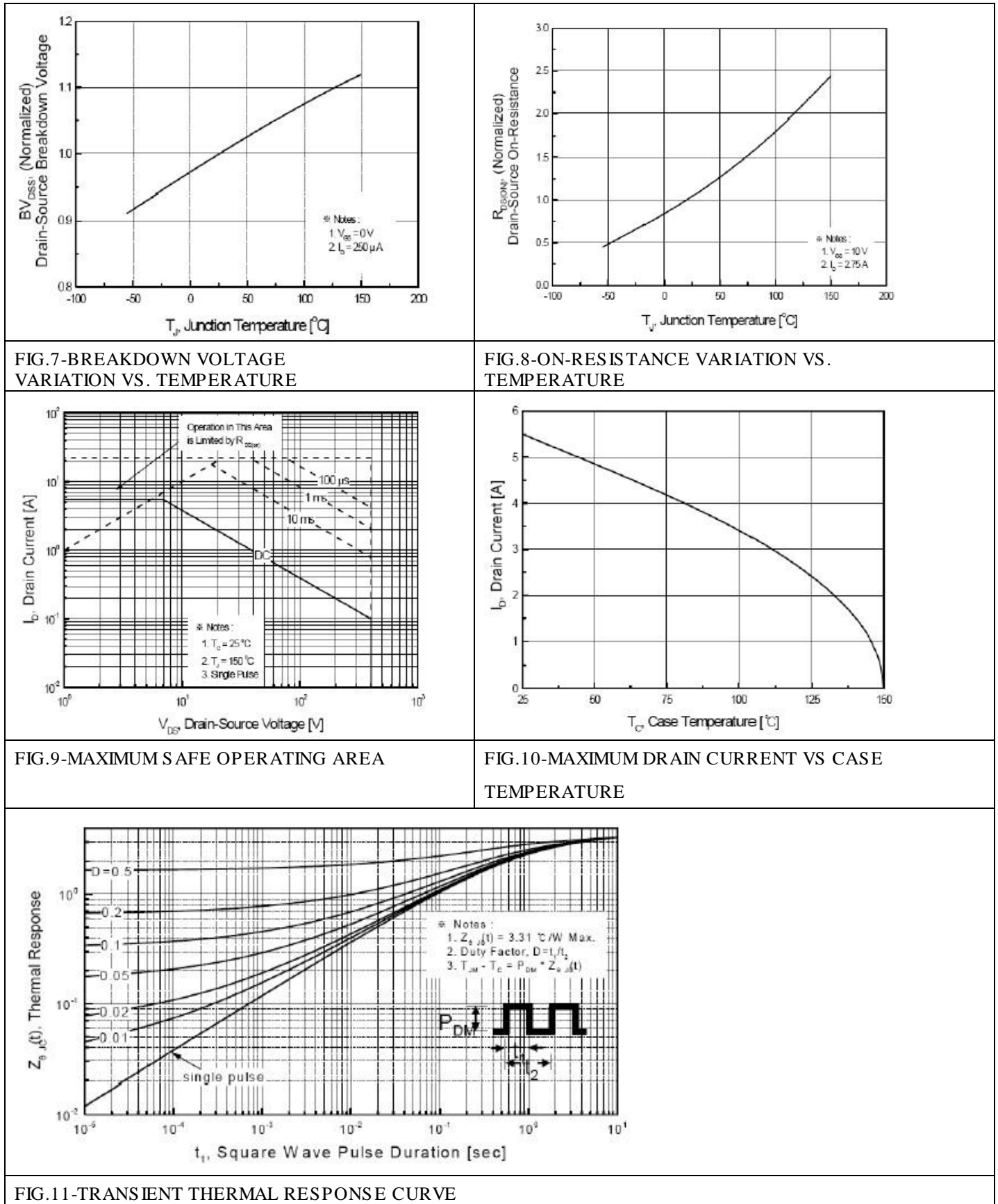


FIG.11-TRANSIENT THERMAL RESPONSE CURVE

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