

MS4N60

N-Channel Enhancement Mode Power MOSFET

Description

The MS4N60 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 TO-220 package is universally preferred for all commercial-industrial applications

Features

- BVDSS=650V typically @ Tj=150°C
- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

Application

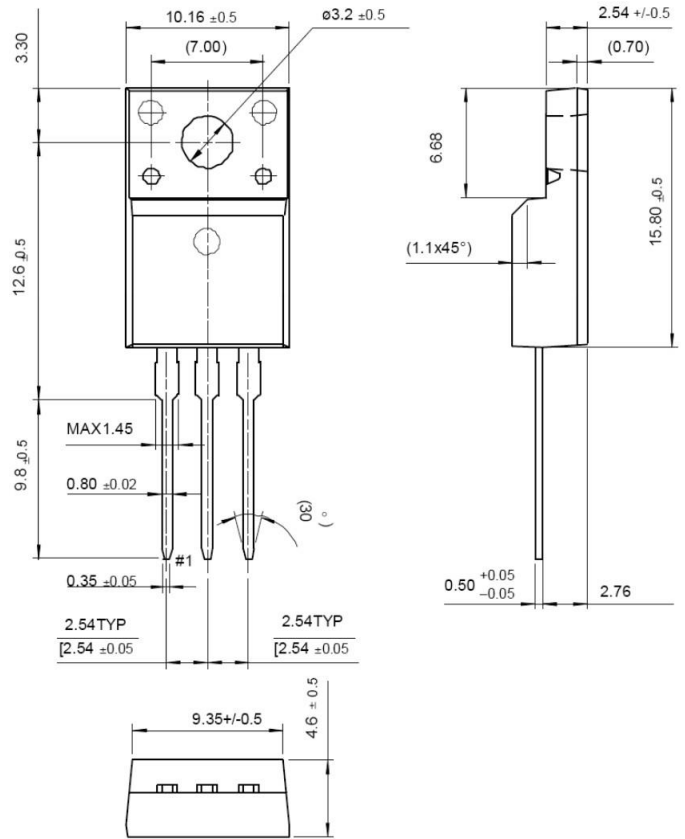
- Open Framed Power Supply
- Adapter
- STB

Packing & Order Information

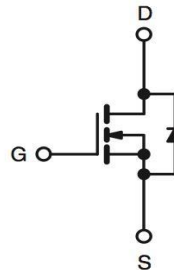
50/Tube ; 1,000/Box



**RoHS
COMPLIANT**



Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V _{DSS}	Drain to Source Voltage	600	V
V _{GS}	Gate to Source Voltage	±30	V
I _D	Continuous Drain Current (TC=25°C)	4.5	A
	Continuous Drain Current (TC=100°C)	2.6	A
I _{DM}	Drain Current Pulsed	18	A
E _{AS}	Single Pulsed Avalanche Energy	210	mJ
E _{AR}	Repetitive Avalanche Energy	10	mJ
dv/dt	Peak Diode Recovery dv/dt	4.5	V/ns

- Drain current limited by maximum junction temperature

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

Symbol	Parameter	Value	Unit
T _L	TL Maximum Temperature for Soldering @ Lead at 0.125 in(0.318mm) from case for 10 seconds	300	°C
T _{PKG}	TPKG Maximum Temperature for Soldering @ Package Body for 10 seconds	260	°C
P _D	Total Power Dissipation(@TC = 25 °C) 100 W	100	W
	Derating Factor above 25 °C	0.8	W/°C
T _{STG}	Operating Junction Temperature	-55 to +150	°C
T _J	Storage Temperature	150	°C

Note:

- 1.Repetitive rating; pulse width limited by maximum junction temperature.
2. I_{AS}=4A, V_{DD}=50V, L=8mH, V_G=10V, starting T_J=+25°C.
3. I_{SD}≤4A, di/dt≤100A/μs, V_{DD}≤BVDSS, starting T_J=+25°C.

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
R _{θJC}	Thermal Resistance,Junction-to-Case	--	--	1.25	°C/W
R _{θJA}	Thermal Resistance,Junction-to-Ambient	--	--	62.5	°C/W

Static Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V , I _D = 250μA	600	--	--	V
ΔBV _{DSS} / ΔT _J	Breakdown Voltage Temperature Coefficient	I _D = 250μA, Referenced to 25°C	--	0.6	--	V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 uA	2.0	--	4.0	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} = 600 V , V _{GS} = 0 V V _{DS} = 480 V , T _C = 125°C	--	--	1 10	μA nA
I _{GSS}	Gate-Source Leakage,Forward	V _{GS} = ±30	--	--	100	nA
R _{DS(ON)}	Static Drain-Source On-state Resis-tance	V _{GS} = -10 V , I _D = 2.25 A	--	2.0	2.5	Ω

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q _g	Total Gate Charge	V _{DS} = 480 V, V _{GS} = 10 V, I _D = 4.5 A	--	16	--	nC
Q _{gs}	Gate-Source Charge		--	2.5	--	nC
Q _{gd}	Gate-Drain Charge (Miller Charge)		--	6.5	--	nC

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Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 300\text{ V}$, $I_D = 4.5\text{ A}$, $V_{GS} = 10\text{ V}$, $R_G = 25\ \Omega$, $R_D = 75\ \Omega$	--	10	--	ns
t_r	Rise Time		--	40	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	40	--	ns
t_f	Fall Time		--	50	--	ns
C_{ISS}	Input Capacitance	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	--	560	--	pF
C_{OSS}	Output Capacitance		--	55	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	7	--	pF

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■ Characteristics Curve

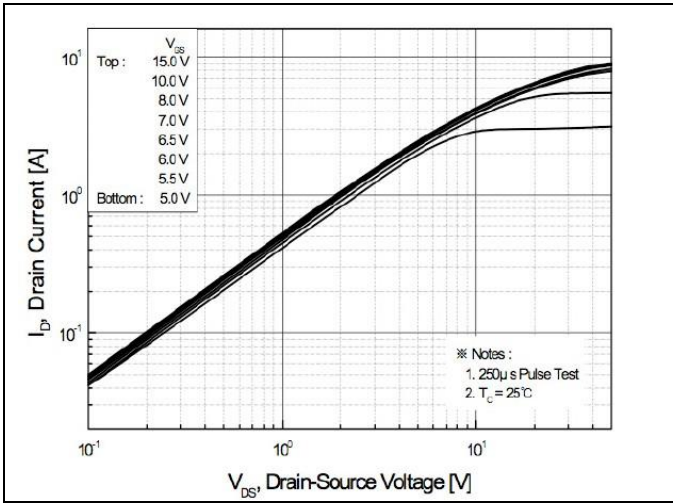


FIG.1-ON REGION CHARACTERISTICS

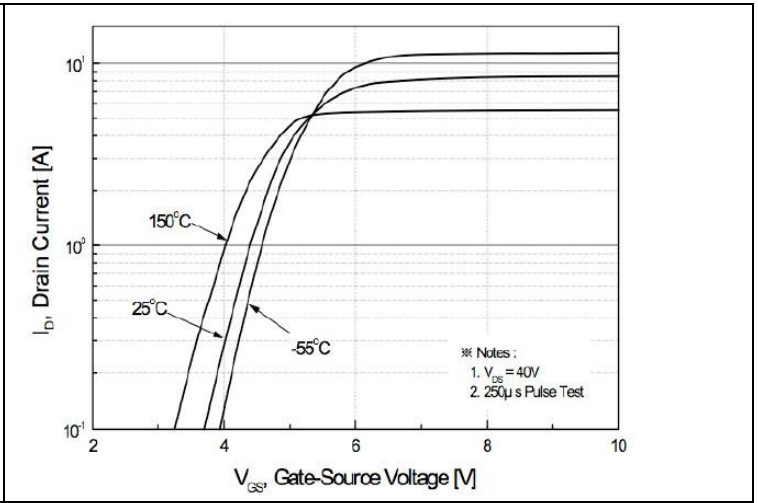


FIG.2-TRANSFER CHARACTERISTICS

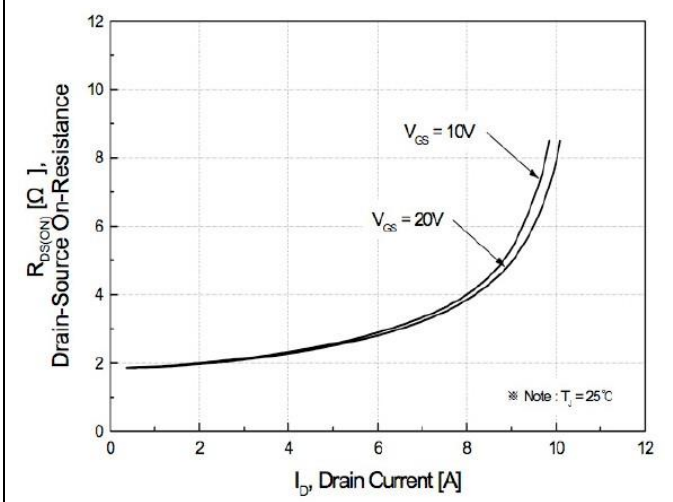


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

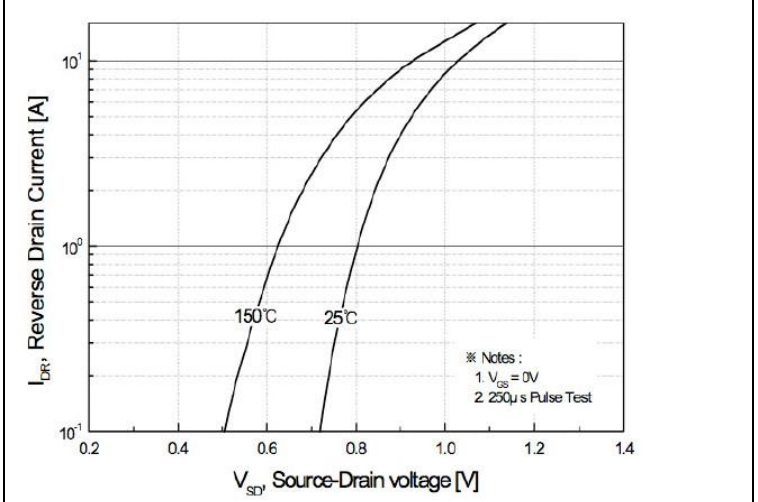


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

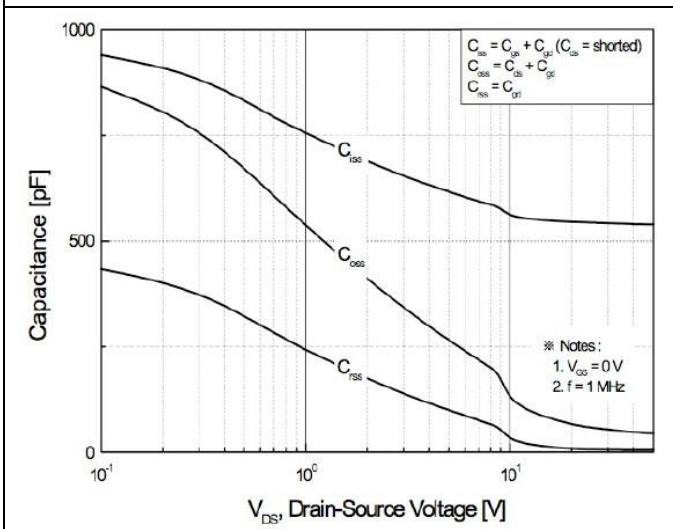


FIG.5-CAPACITANCE CHARACTERISTICS

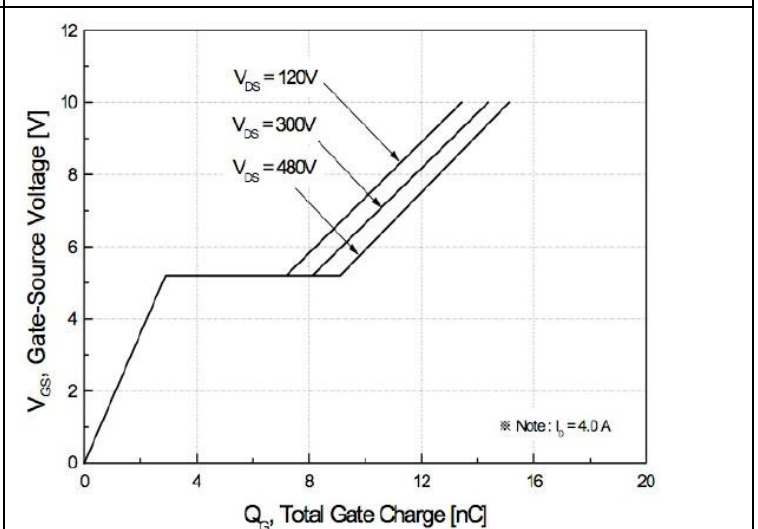


FIG.6-GATE CHARGE CHARACTERISTICS

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■ Characteristics Curve

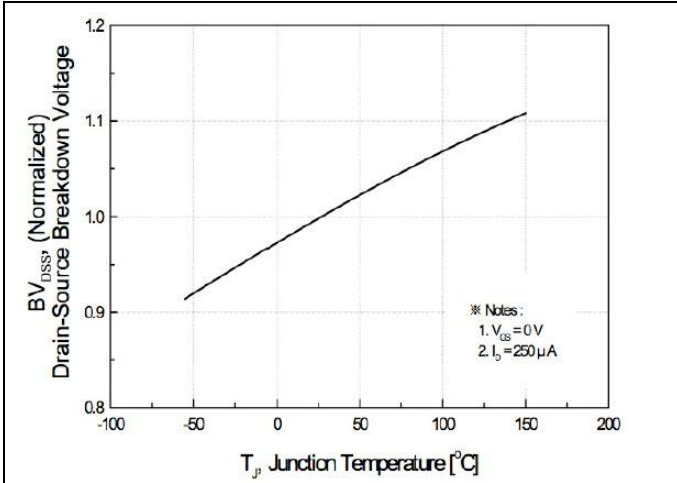


FIG.7-BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

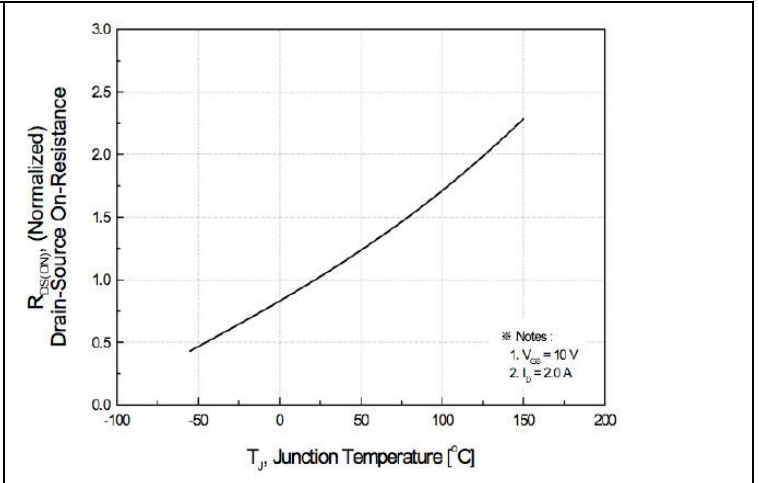


FIG.8-ON-RESISTANCE VARIATION VS TEMPERATURE

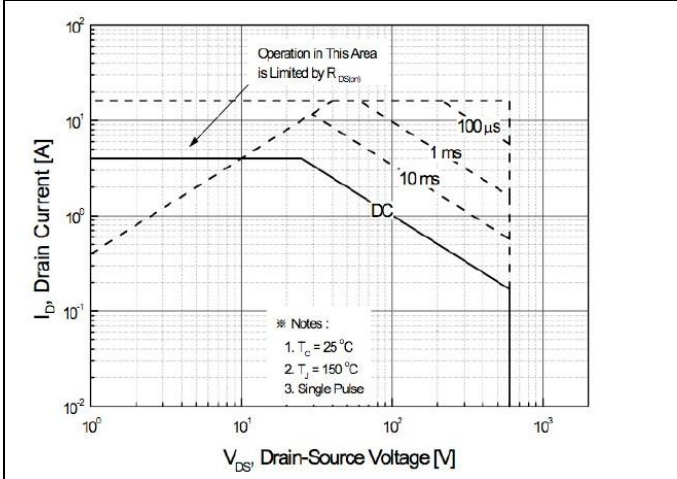


FIG.9-MAXIMUM SAFE OPERATING AREA

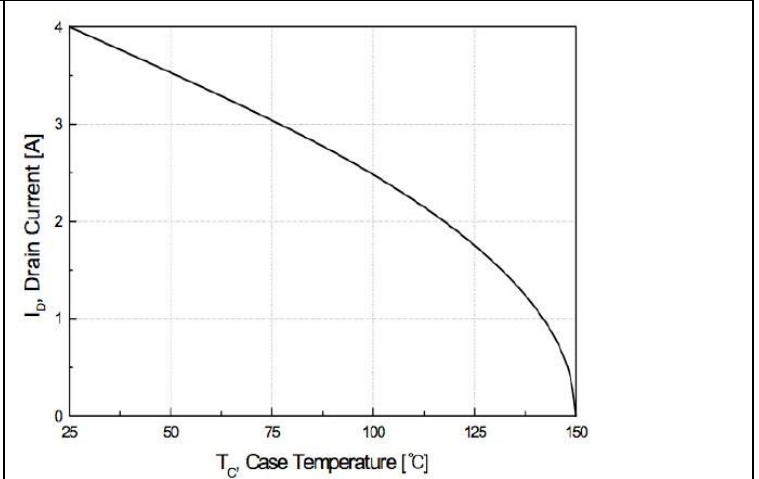


FIG.10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

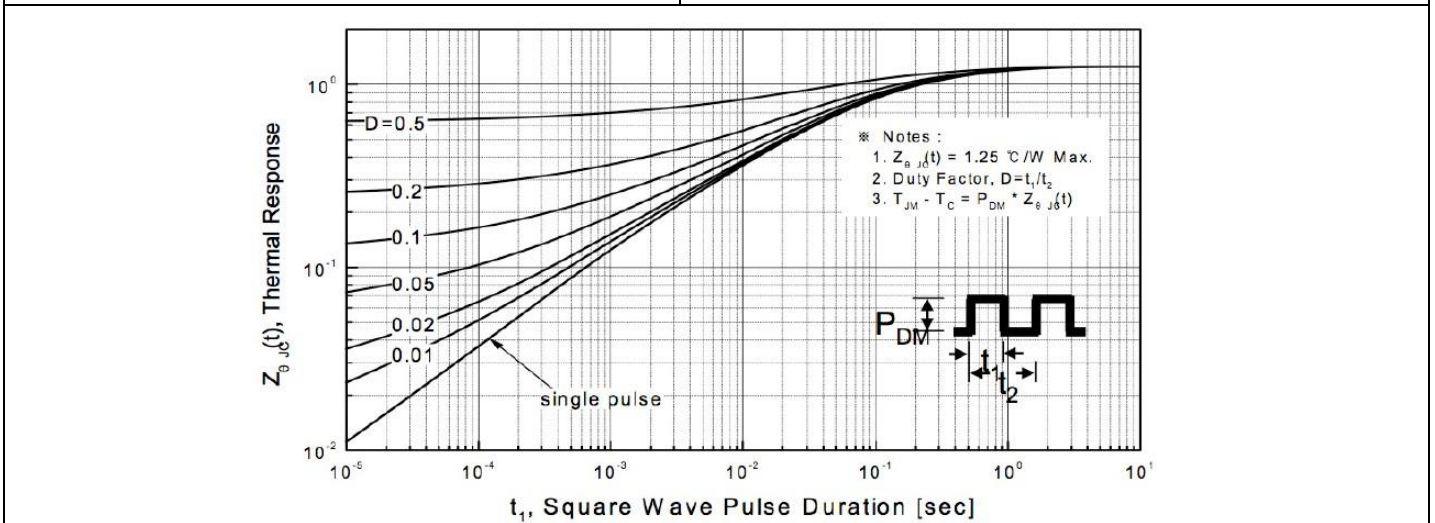


FIG.11-TRANSIENT THERMAL RESPONSE CURVE

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