

MS5N50-A

N-Channel Enhancement Mode Power MOSFET

Description

The MS5N50-A 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=550V typically @ Tj=150°C
- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS & Halogen free compliant package

Application

- Ballast
- Inverter

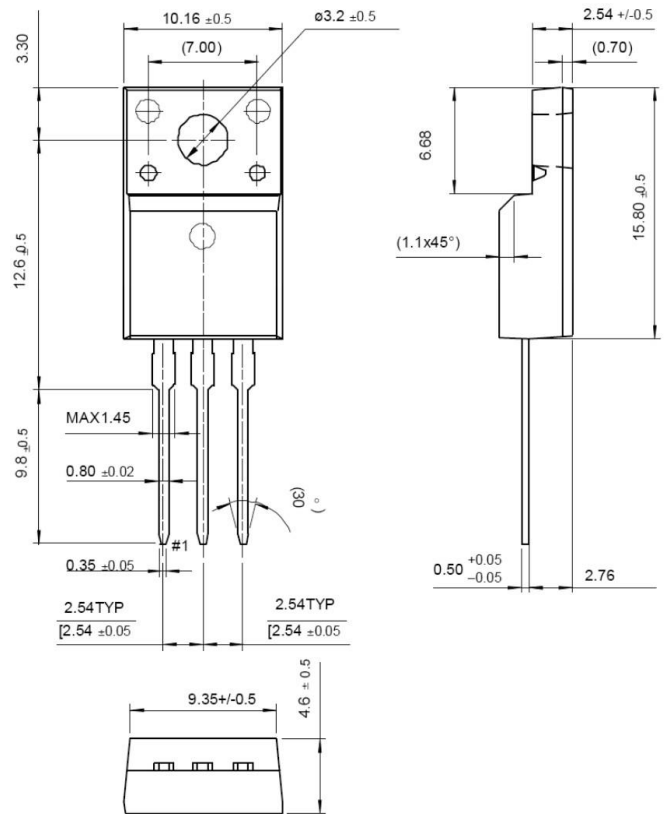
Packing & Order Information

50/Tube ; 1,000/Box

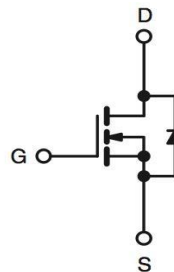


RoHS
COMPLIANT

HALOGEN
FREE
Available



Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _{DSS}	Drain to Source Voltage	500	V
V _G	Gate to Source Voltage	±30	V
I _D	Continuous Drain Current (TC=25°C)	5	A
	Continuous Drain Current (TC=100°C)	3.2	A
I _{DM}	Drain Current Pulsed	20	A
E _{AS}	Single Pulsed Avalanche Energy	305	mJ
E _{AR}	Repetitive Avalanche Energy	10.1	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

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	101	W
	Derating Factor above 25 °C	0.81	W/°C
T_{STG}	Operating Junction Temperature	-55 to +150	°C
T_J	Storage Temperature	150	°C

Note:

1. $T_J = +25^{\circ}\text{C}$ to $+150^{\circ}\text{C}$.
2. Repetitive rating; pulse width limited by maximum junction temperature.
3. $I_{SD} = 4.5\text{A}$, $dI/dt < 100\text{A}/\mu\text{s}$, $V_{DD} < BVDSS$, $T_J = +150^{\circ}\text{C}$.
4. $I_{AS} = 4.5\text{A}$, $V_{DD} = 50\text{V}$, $L = 15\text{mH}$, $R_G = 25\Omega$, starting $T_J = +25^{\circ}\text{C}$.

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	--	--	1.47	°C/W
$R_{\theta JA}$	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	$V_{GS} = 0\text{V}$, $I_D = 250\mu\text{A}$	500	--	--	V
		$T_J = 150^{\circ}\text{C}$	--	550	--	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250\mu\text{A}$, Referenced to 25°C	--	0.64	--	V/°C
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	2.0	--	4.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS} = 500\text{V}$, $V_{GS} = 0\text{V}$	--	--	1	μA
		$V_{DS} = 400\text{V}$, $T_C = 125^{\circ}\text{C}$	--	--	10	nA
I_{GSS}	Gate-Source Leakage, Forward	$V_{GS} = \pm 30$	--	--	± 100	nA
$R_{DS(ON)}$	Static Drain-Source On-state Resistance	$V_{GS} = -10\text{V}$, $I_D = 2.5\text{A}$	--	1.3	1.6	Ω

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	$V_{DD} = 250\text{V}$, $V_{GS} = 10\text{V}$, $I_D = 5\text{A}$	--	15	--	nC
Q_{gs}	Gate-Source Charge		--	3.5	--	nC
Q_{gd}	Gate-Drain Charge (Miller Charge)		--	6	--	nC

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Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 250\text{ V}$, $I_D = 4.5\text{ A}$, $V_{GS} = 10\text{ V}$, $R_G = 10\ \Omega$	--	45	--	ns
t_r	Rise Time		--	26	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	133	--	ns
t_f	Fall Time		--	214	--	ns
C_{ISS}	Input Capacitance	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	--	492	--	pF
C_{OSS}	Output Capacitance		--	83	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	16	--	pF

Source-Drain Diode						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
I_S		$I_S = 5\text{ A}$, $V_{GS} = 0\text{ V}$	--	--	1.4	V
I_{SM}		$V_D = V_G = 0$, $V_S = 1.3\text{ V}$	--	--	5	A
V_{SD}			--	--	20	A
t_{rr}		$V_{GS} = 0$, $I_F = 5\text{ A}$, $di/dt = 100\text{ A/us}$	--	268	--	ns
Q_{rr}			--	2.1	--	uC

*Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

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