

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

Package type : TO-220AB

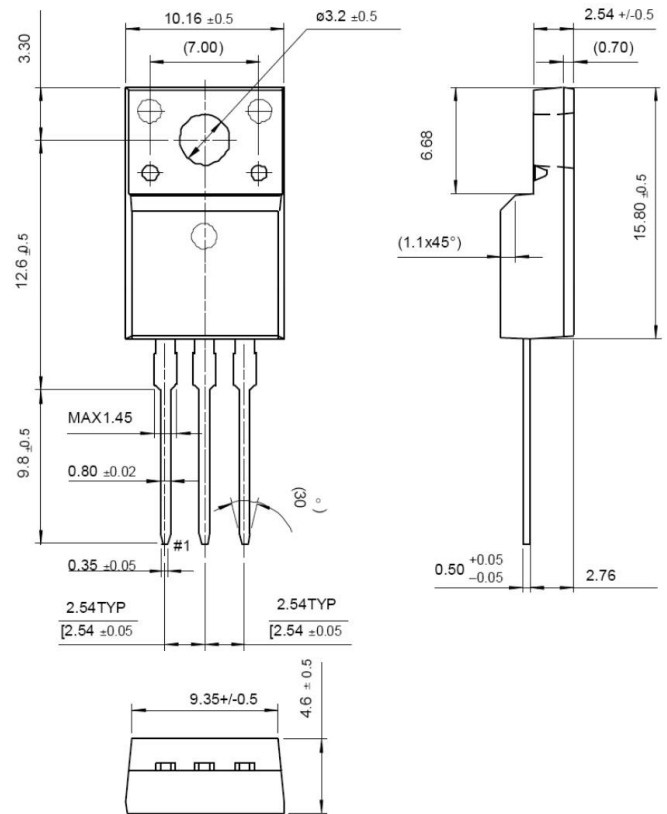
Packing & Order Information

50/Tube ; 1,000/Box

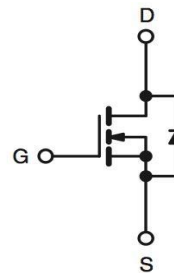


RoHS
COMPLIANT

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) Continuous Drain Current (TC=100°C)	5 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

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- 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°C to +150°C.
2. Repetitive rating; pulse width limited by maximum junction temperature.
3. I_{SD}=4.5A, di/dt<100A/μs, V_{DD}<B_{VDSS}, T_J=+150°C.
4. I_{AS}=4.5A, V_{DD}=50V, L=15mH, R_G=25Ω, starting T_J=+25°C.

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
R _{θJC}	Thermal Resistance, Junction-to-Case	--	--	1.47	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	--	--	62.5	°C/W

Static Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
B _{VDSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 uA	500	--	--	V
		T _j = 150°C	--	550	--	V
ΔB _{VDSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D = 250μA, Referenced to 25°C	--	0.64	--	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} = 500 V, V _{GS} = 0 V V _{DS} = 400 V, T _C = 125°C	--	--	1 10	uA nA
I _{GSS}	Gate-Source Leakage, Forward	V _{GS} = ±30	--	--	±100	nA
R _{DSON}	Static Drain-Source On-state Resistance	V _{GS} = -10V, I _D = 2.5 A	--	1.3	1.6	Ω

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q _g	Total Gate Charge	V _{DD} = 250 V, V _{GS} = 10 V, I _D = 5 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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