

## MS 50N06

### N-Channel Enhancement Mode Power MOSFET

#### Description

The MS50N60 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-220AB package is universally preferred for all commercial-industrial applications

#### Features

- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

#### Application

- Power Factor Correction
- LCD TV Power
- Full and Half Bridge Power
- E-bike Charger

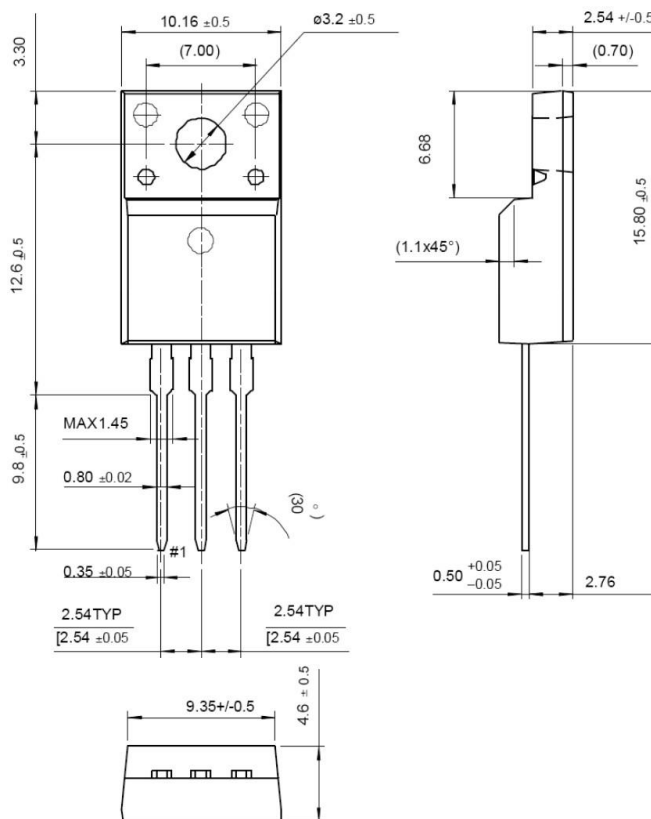
**Package type :** TO-220AB

#### Packing & Order Information

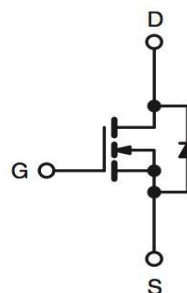
50/Tube ; 1,000/Box



**RoHS  
COMPLIANT**



Graphic symbol



### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V <sub>DS</sub>	Drain-Source Voltage	60	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current @ TC=25°C	50	A
	Continuous Drain Current @ TC=100°C	35	A
I <sub>DM</sub> *1	Pulsed Drain Current	200	A
I <sub>AS</sub>	Avalanche Current	50	A
E <sub>AS</sub>	Avalanche Energy	500	mJ

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

Symbol	Parameter	Value	Unit
E <sub>AR</sub> *2	Repetitive Avalanche Energy	12	mJ
dv/dt	Peak Diode Recovery dv/dt	4.5	V/ns
P <sub>D</sub>	Power Dissipation (TC=25°C)	120	W
	Power Dissipation (TC=100°C)	0.8	W
T <sub>J</sub> /T <sub>STG</sub>	Operating Junction and Storage Temperature	-55 to +175	°C

#### NOTE:

1. Pulse width limited by maximum junction temperature.
2. L=200μH, I<sub>AS</sub>=50A, V<sub>DD</sub>=30V, starting T<sub>J</sub>=+25°
3. I<sub>SD</sub>≤50A, di/dt<100A/μs, V<sub>DD</sub>≤BVDSS, T<sub>J</sub>≤T<sub>j</sub>(max).

#### Thermal Resistance Ratings (Tc=25°C unless otherwise noted)

Parameter	Symbol	Value	Units
R <sub>thjc</sub>	Typical thermal resistance	1.24	°C/W
R <sub>θJA</sub>		62.5	

#### Static Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
BDVSS	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250μA	60	--	--	V
V <sub>GS</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	2.0	2.8	4.0	V
g <sub>fs</sub>	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 20 A	--	28	--	S
I <sub>GSS</sub>	V <sub>GS</sub> = ±20	--	--	±100	nA
I <sub>DSS</sub>	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0 V V <sub>DS</sub> = 48 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125°C	--	--	5 25	uA
I <sub>D(on)</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 10 V	50	--	--	A
*R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A V <sub>GS</sub> = 15 mV, V <sub>SD</sub> = 0, f = 1MHz	--	19 28	22	mΩ

#### Dynamic Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
t <sub>d(on)</sub>	V <sub>DS</sub> = 50 V, R <sub>D</sub> = 6 Ω, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 1 A	--	--	--	ns
t <sub>r</sub>		--	--	--	ns
t <sub>d(off)</sub>		--	--	--	ns
t <sub>f</sub>		--	--	--	ns
C <sub>ISS</sub>	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0 V f = 1MHz	--	--	--	pF
C <sub>OSS</sub>		--	--	--	pF
C <sub>RSS</sub>		--	--	--	pF

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Dynamic Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
$R_g$	$V_{DS} = 80\text{ V}$ , $I_D = 30\text{ A}$ , $V_{GS} = 10\text{ V}$	--	--	--	$\Omega$
$Q_g$		--	--	--	nC
$Q_{gs}$		--	--	--	nC
$Q_{gd}$		--	--	--	nC

NOTE:

1. Pulse Test : Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$
2. Independent of operating temperature
3. Pulse width limited by maximum junction temperature.

Source-Drain Diode Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
$I_S$		--	--	50	A
$I_{SM}$		--	--	140	
$V_{SD}$	$I_S = 25\text{ A}$ , $V_{GS} = 0$	--	--	1.3	V
$t_{rr}$	$I_F = 50\text{ A}$ , $V_{GS} = 0$ , $dI_F/dt = 100\text{ A}/\mu\text{s}$	--	22	--	ns
$Q_{rr}$		--	180	--	nC

Ordering Information	
Parameter	Shipping
TO-220	50 pcs/tube, 20 tubes/box, 4 boxes / carton

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#### Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE

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