

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

## 5P06-MS

Product specification

## Description

The 5P06-MS is the high cell density trench P-ch MOSFETs, which provides excellent R<sub>DS(on)</sub> and efficiency for most of the small power switching and load switch applications.

The 5P06-MS meet the RoHS and Green Product requirement with full function reliability approved.

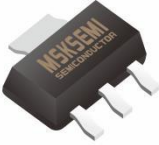
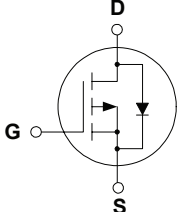

## Product Summary

<b>BVDSS</b>	-60V
<b>R<sub>DS(on)</sub></b>	110mΩ
<b>ID</b>	-5A

## FEATURE

- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

## Reference News

PACKAGE OUTLINE	PIN CONFIGURATION	Marking
 <p>SOT-223</p>		

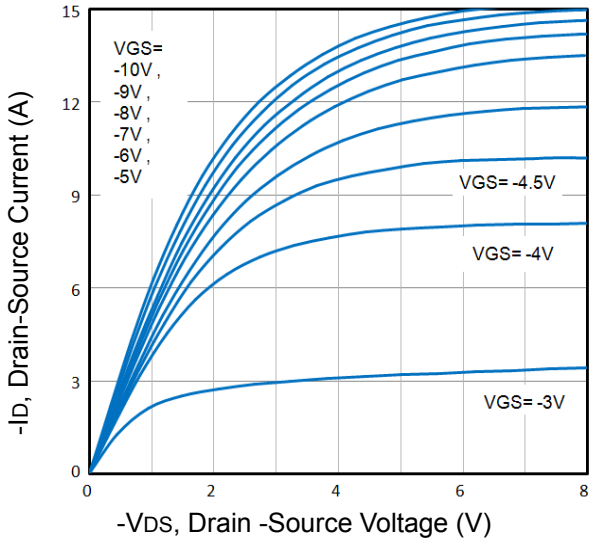
## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source voltage	<b>V<sub>DS</sub></b>	-60	V
Gate-Source voltage	<b>V<sub>GS</sub></b>	±20	
Continuous Drain Current	<b>I<sub>D</sub></b>	-5.0	A
Pulsed Drain Current <sup>1</sup>	<b>I<sub>DM</sub></b>	-5.2	A
Power Dissipation	<b>P<sub>D</sub></b>	1	W
Junction Temperature	<b>T<sub>J</sub></b>	150	°C
Storage Temperature	<b>T<sub>STG</sub></b>	-55~ 150	°C
Thermal Resistance from Junction to Ambient <sup>2</sup>	<b>R<sub>θJA</sub></b>	125	°C/W

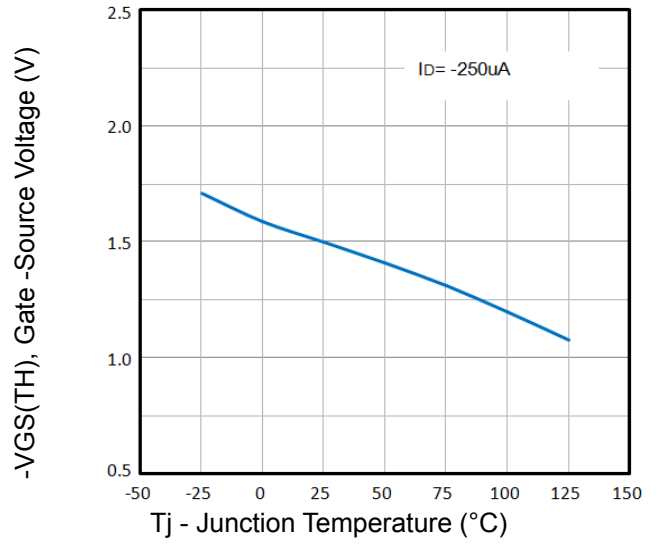
**Electrical Characteristics (T = 25°C unless otherwise noted)**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-60	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current(T <sub>A</sub> =25°C)	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T <sub>A</sub> =125°C)	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V	--	--	-100	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.0	-1.5	-2.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance②	V <sub>GS</sub> =-10V, I <sub>D</sub> =-2A	--	110	180	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance②	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1A	--	150	200	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, f=1MHz	--	310	--	pF
C <sub>oss</sub>	Output Capacitance		--	22	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	15	--	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-30V I <sub>D</sub> =-2A, V <sub>GS</sub> =-10V	--	5.4	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	1.1	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	1.6	--	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn on Delay Time	V <sub>DD</sub> =-30V, I <sub>D</sub> =-2A, R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =-10V	--	41	--	ns
t <sub>r</sub>	Turn on Rise Time		--	22	--	ns
t <sub>d(off)</sub>	Turn Off Delay Time		--	25	--	ns
t <sub>f</sub>	Turn Off Fall Time		--	32	--	ns
<b>Source Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source drain current(Body Diode)	T <sub>A</sub> =25°C	--	--	-2.0	A
V <sub>SD</sub>	Forward on voltage②	T <sub>J</sub> =25°C, I <sub>SD</sub> =-2A, V <sub>GS</sub> =0V	--	-0.84	-1.2	V

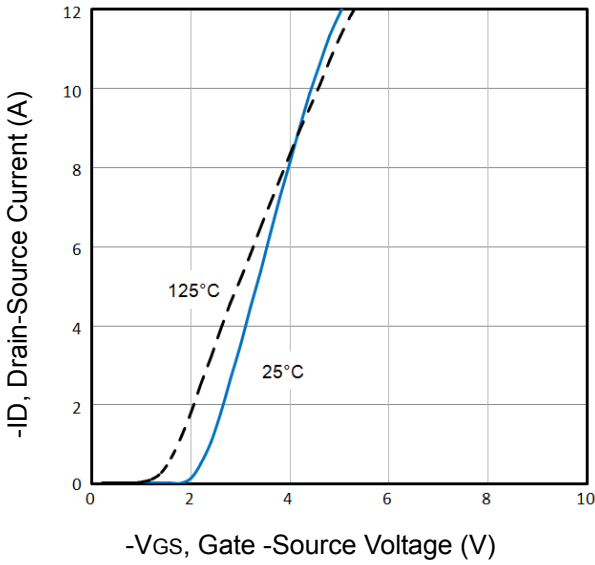
**Typical Characteristics**



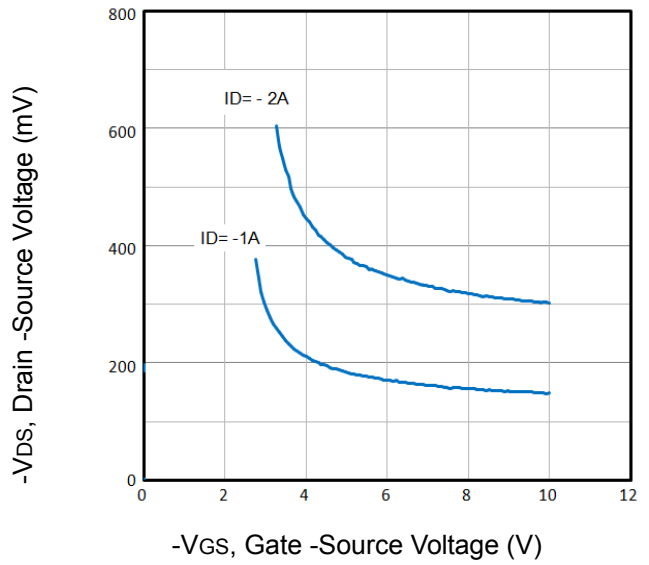
**Fig1.** Typical Output Characteristics



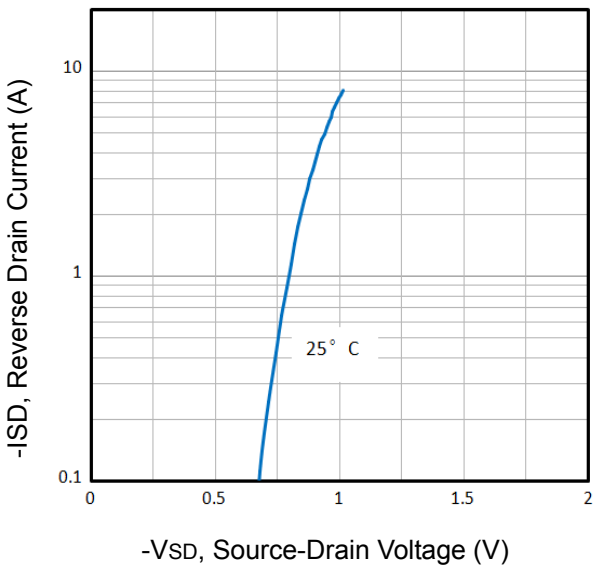
**Fig2.** Normalized Threshold Voltage Vs. Temperature



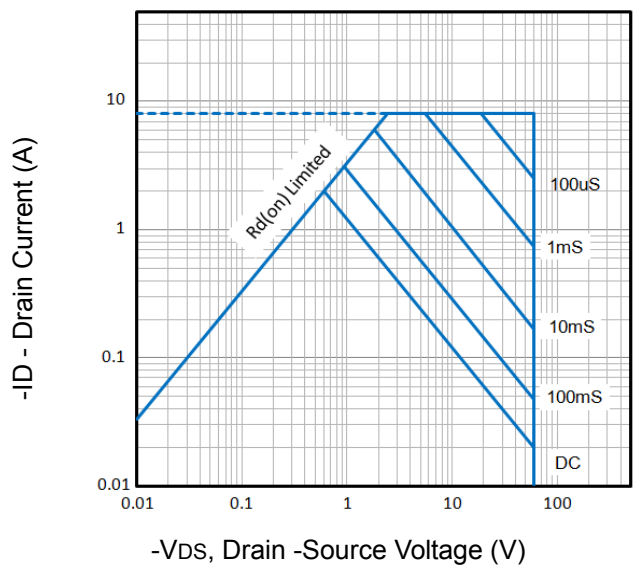
**Fig3.** Typical Transfer Characteristics



**Fig4.** Drain-Source Voltage vs Gate-Source Voltage

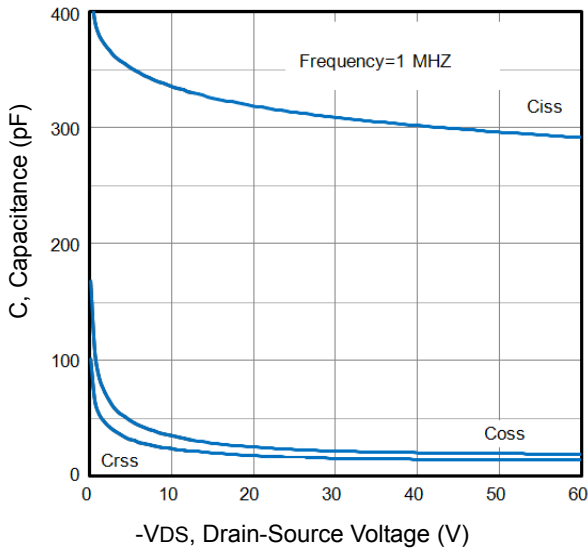


**Fig5.** Typical Source-Drain Diode Forward Voltage

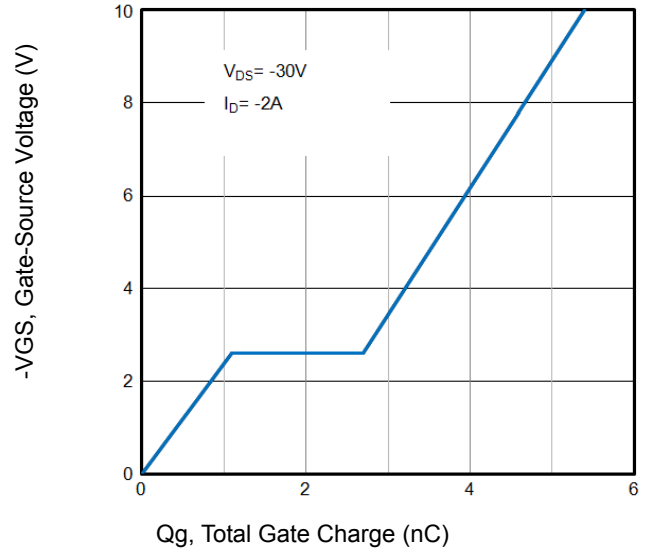


**Fig6.** Maximum Safe Operating Area

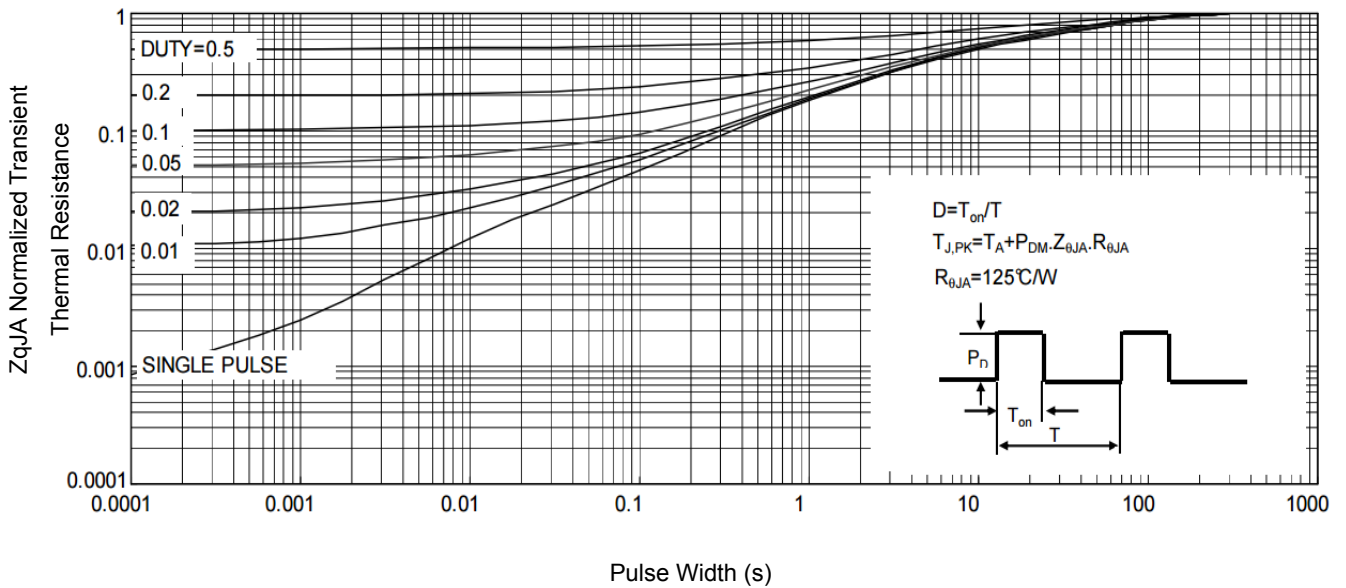
Typical Characteristics



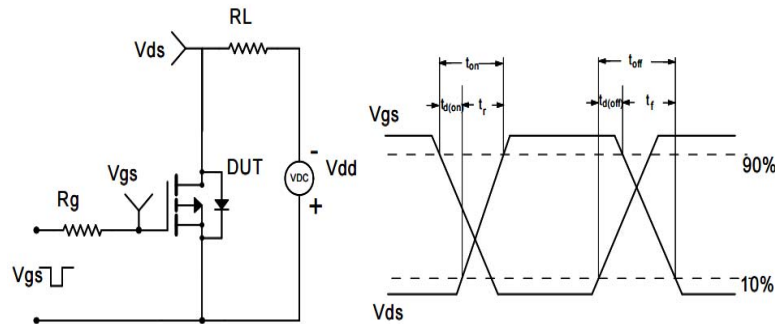
**Fig7.** Typical Capacitance Vs. Drain-Source Voltage



**Fig8.** Typical Gate Charge Vs. Gate-Source Voltage

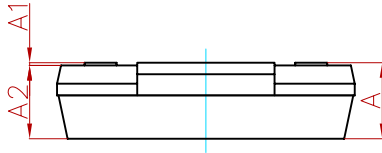
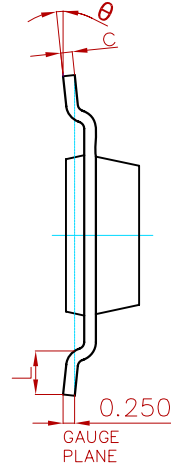
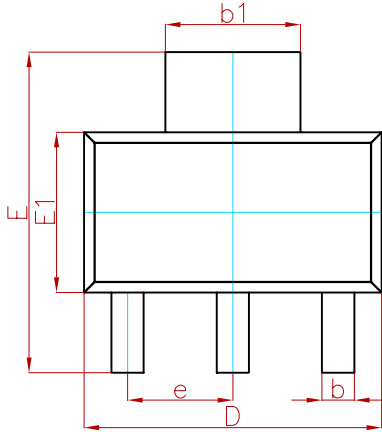


**Fig9.** Normalized Maximum Transient Thermal Impedance



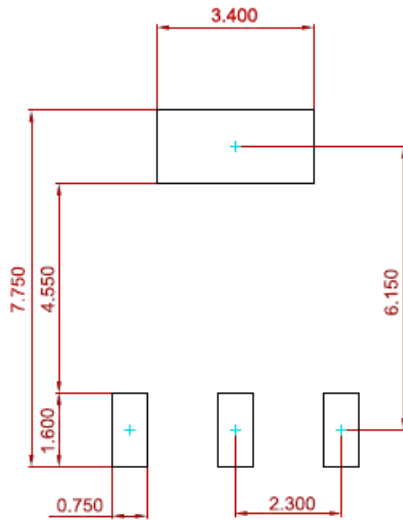
**Fig10.** Switching Time Test Circuit and waveforms

**PACKAGE MECHANICAL DATA**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	—	1.800	—	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	—	0.030	—
$\theta$	0°	10°	0°	10°

**Suggested Pad Layout**



**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050$  mm.
3. The pad layout is for reference purposes only.

**REEL SPECIFICATION**

P/N	PKG	QTY
5P06-MS	SOT-223	1000

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