AT006SP030MSI

P-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-30V	55mΩ@-10V	-6A
	90mΩ@-4.5V	

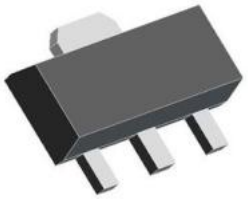
Feature

- Advanced trench technology
- Excellent $R_{DS(ON)}$
- Low gate charge

Application

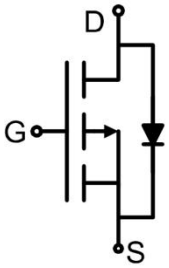
- Battery protection
- Load switch
- Uninterruptible power supply

Package

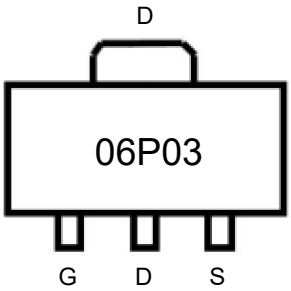


SOT-89

Circuit diagram



Marking



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Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1] (V_{GS}=10V)	I_D	-6	A
Continuous Drain Current[1] (V_{GS}=10V, T_C=100℃)	I_D (T_C=100℃)	-3.3	A
Pulsed Drain Current[1]	I_{DM}	-20.4	A
Power Dissipation[3] (T_A=25℃)	P_D	2.15	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	58	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} =0V, I_D =-250μA	-30			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-30V, V_{GS} =0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.0	-1.6	-2.5	V
Drain-source on-resistance[2]	$R_{DS(on)}$	V_{GS} =-10V, I_D =-5A		40	55	mΩ
		V_{GS} =-4.5V, I_D =-4A		65	90	
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =-15V, V_{GS} =0V, f =1MHz		596		pF
Output Capacitance	C_{oss}			95		
Reverse Transfer Capacitance	C_{rss}			68		
Total Gate Charge	Q_g	V_{DS} =-15V, V_{GS} =-10V I_D =-5.1A		6.8		nC
Gate-Source Charge	Q_{gs}			1		
Gate-Drain Charge	Q_{gd}			1.4		
Turn-on delay time	$t_{d(on)}$	V_{DS} =-15V, V_{GS} =-10V I_D =-1A, R_G =2.5Ω		14		nS
Turn-on rise time	t_r			61		
Turn-off delay time	$t_{d(off)}$			19		
Turn-off fall time	t_f			10		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				-6	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =-5.1A			-1.2	V

Notes:

1) The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2) The data tested by pulsed , pulse width ≦300us , duty cycle ≦2%.

3) The power dissipation is limited by 150℃junction temperature.

4) Guaranteed by design, not subject to production testing.

Typical Characteristics

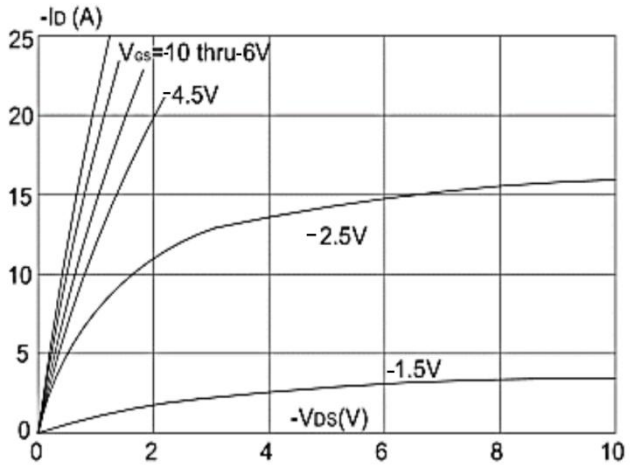


Figure1: Output Characteristics

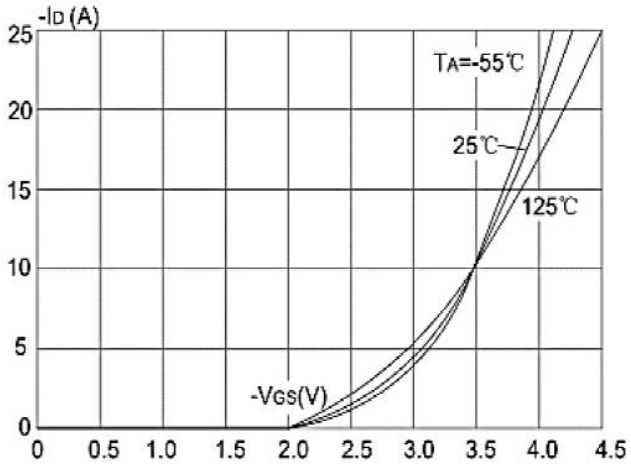


Figure 2: Typical Transfer Characteristics

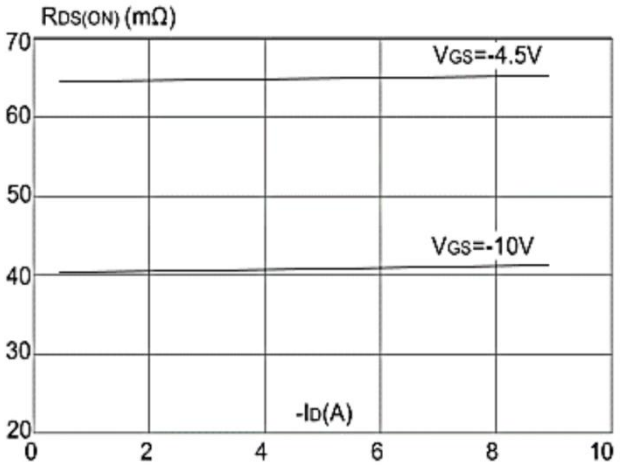


Figure 3:On-resistance vs. Drain Current

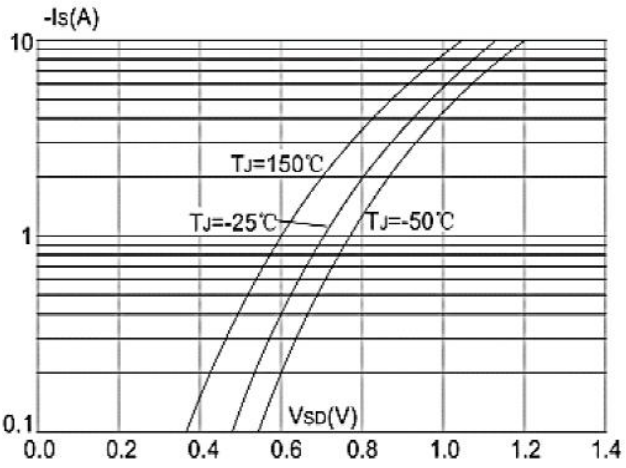


Figure 4: Body Diode Characteristics

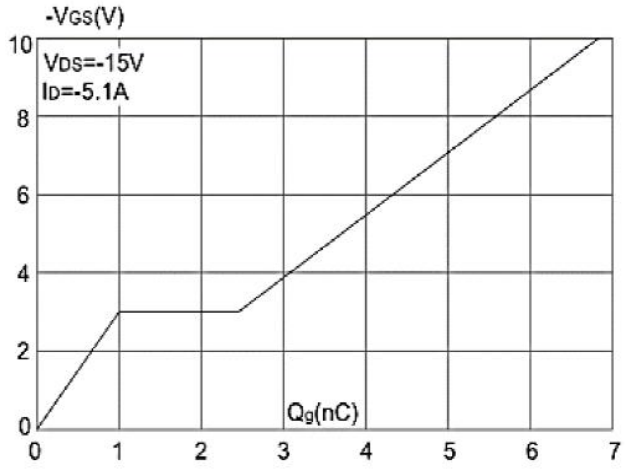


Figure 5: Gate Charge Characteristics

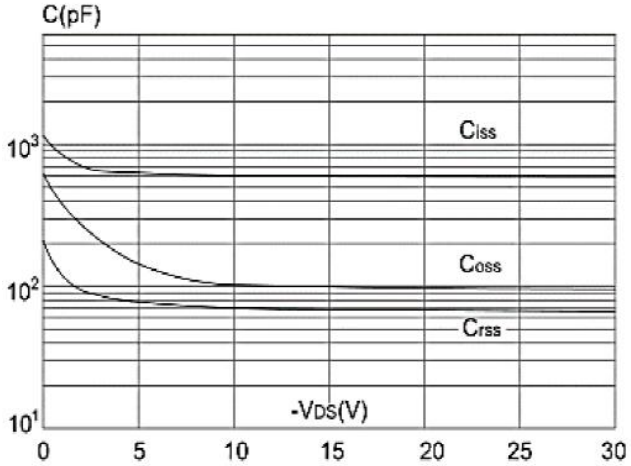


Figure 6: Capacitance Characteristics

Typical Characteristics

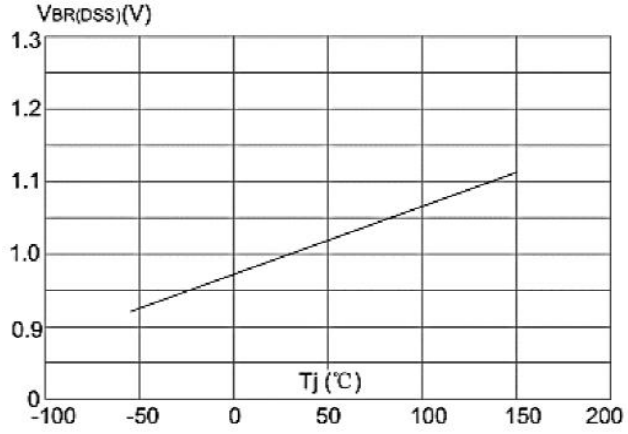


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

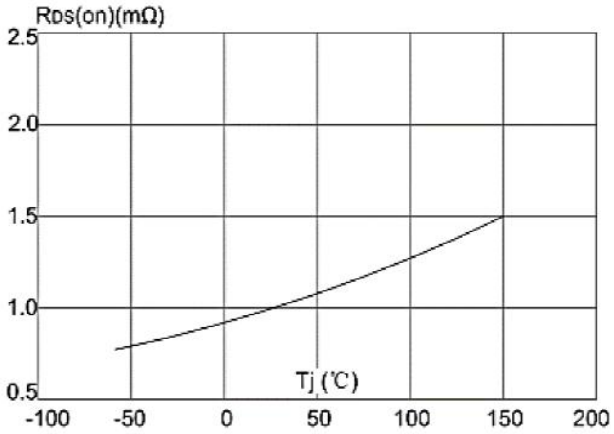


Figure 8: Normalized on Resistance vs Junction Temperature

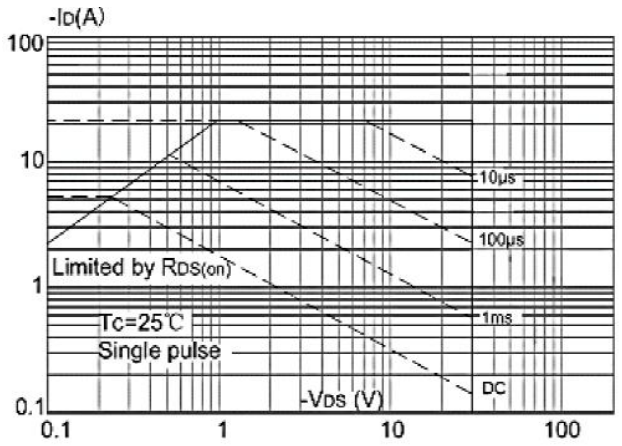


Figure 9: Maximum Safe Operating Area vs. Case Temperature

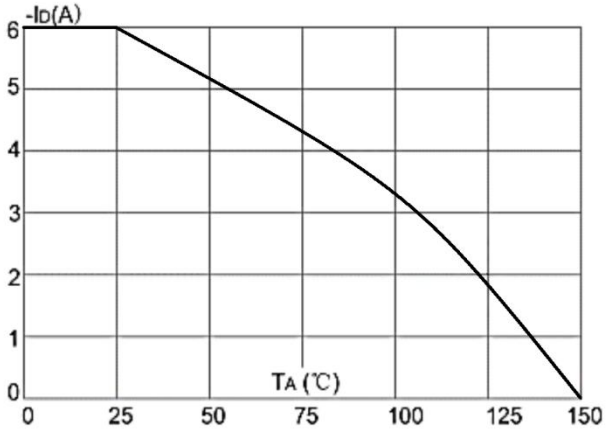


Figure 10: Maximum Continuous Drain Current

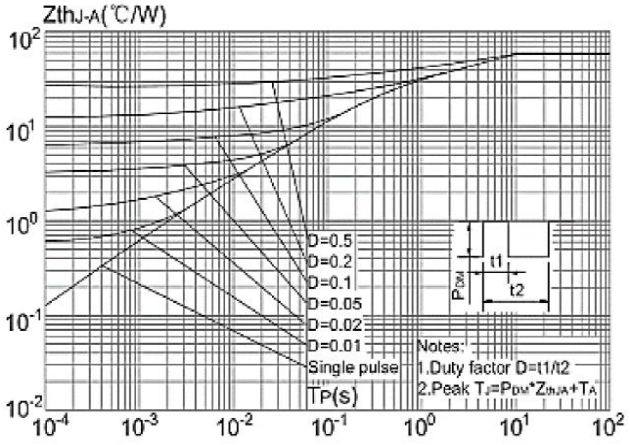
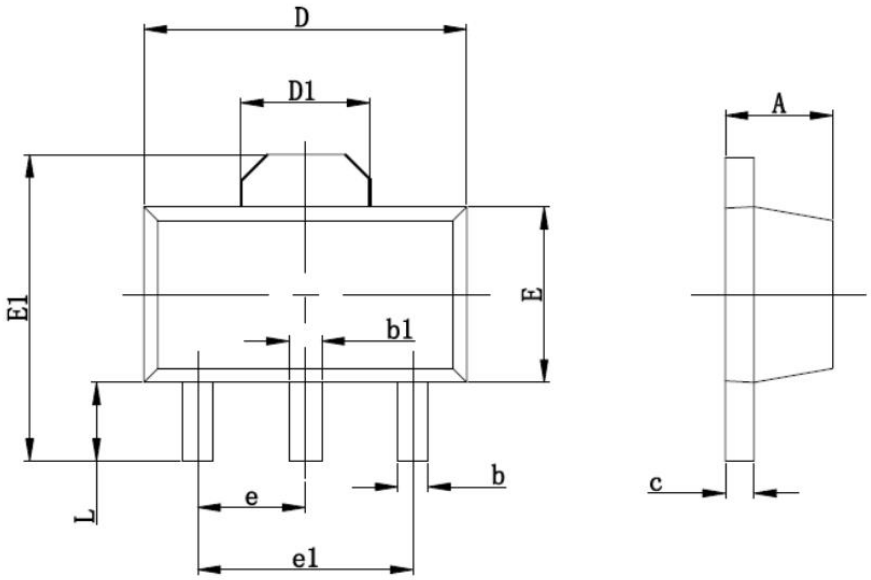


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

SOT-89 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.014	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.093	0.100
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.059 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.100	0.035	0.043