AT0P5SN030ESA

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	650mΩ@4.5V	0.5A
	800mΩ@2.5V	

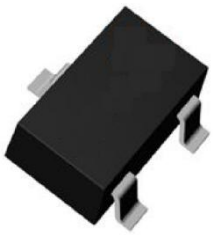
Feature

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- ESD Protection

Application

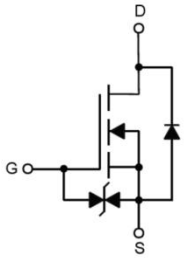
- Load Switch
- PWM Application
- Power Management

Package

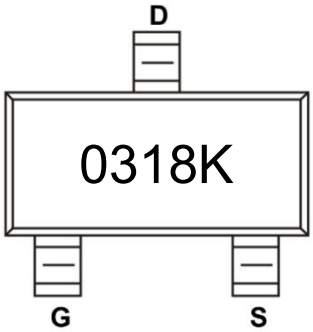


SOT-23

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current (T_A=25℃)	I_D	0.5	A
Continuous Drain Current (T_A=100℃)	I_D (100℃)	0.3	A
Pulsed Drain Current[1]	I_{DM}	2	A
Power Dissipation (T_A=25℃)	P_D	0.35	W
Thermal Resistance from Junction to Ambient[2]	$R_{\theta JA}$	357	℃/W
Junction Temperature	T_J	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_{GS} =±10V, V_{DS} = 0V			±10	μA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.4	0.7	1.2	V
Drain-source on-resistance[3]	$R_{DS(on)}$	V_{GS} =4.5V, I_D =0.2A		515	650	mΩ
		V_{GS} =2.5V, I_D =0.15A		615	800	
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =15V,V_{GS} =0V,f =1MHz		27		pF
Output Capacitance	C_{oss}			6		
Reverse Transfer Capacitance	C_{rss}			3		
Total Gate Charge	Q_g	V_{DS} =15V,V_{GS} =0 to 4.5V, I_D =0.3A		1.6		nC
Gate-Source Charge	Q_{gs}			0.2		
Gate-Drain Charge	Q_{gd}			0.5		
Turn-on delay time	$t_{d(on)}$	V_{DD} =30V, V_{GS} =10V, I_D =0.5A, R_{GEN}=10Ω,		2		nS
Turn-on rise time	t_r			14		
Turn-off delay time	$t_{d(off)}$			6		
Turn-off fall time	t_f			9		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				0.5	A
Pulsed Diode Forward Current	I_{SM}				2	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=0.5A			1.2	V

Notes:

1) Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2) $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.

3) Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

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

Typical Characteristics

Figure 1: Output Characteristics

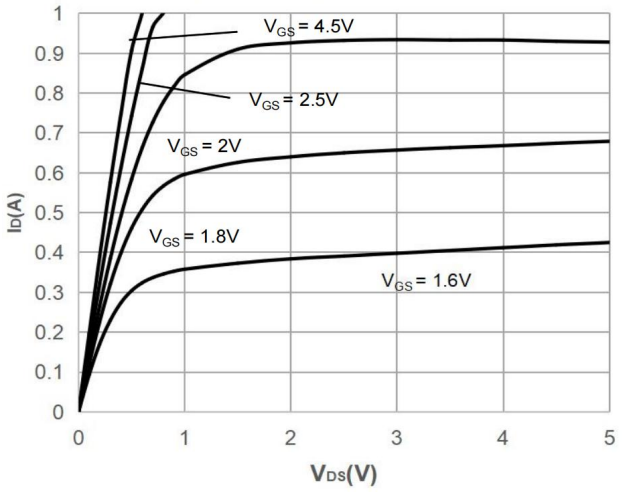


Figure 2: Typical Transfer Characteristics

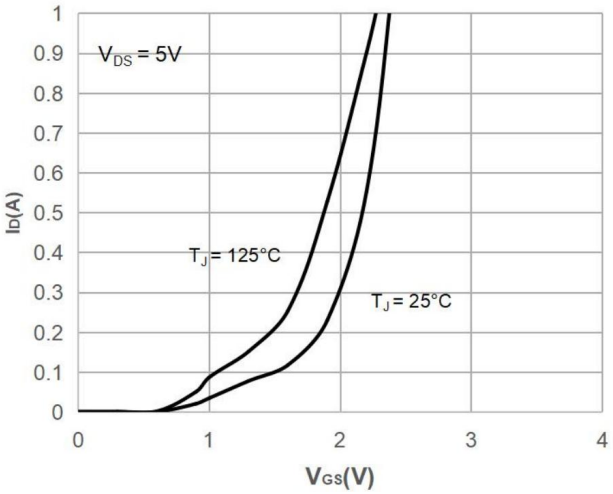


Figure 3: On-resistance vs. Drain Current

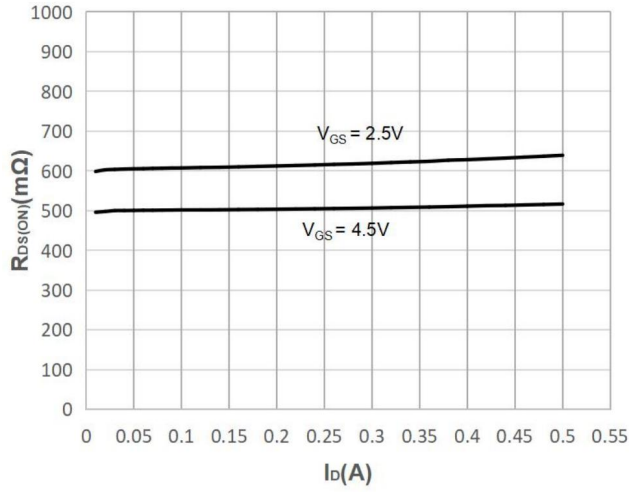


Figure 4: Body Diode Characteristics

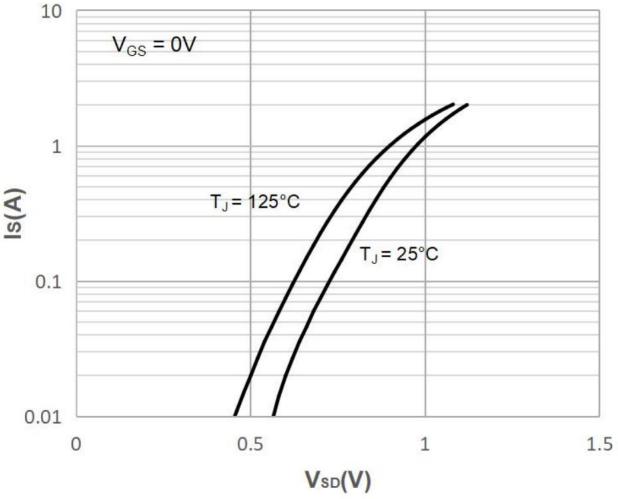


Figure 5: Gate Charge Characteristics

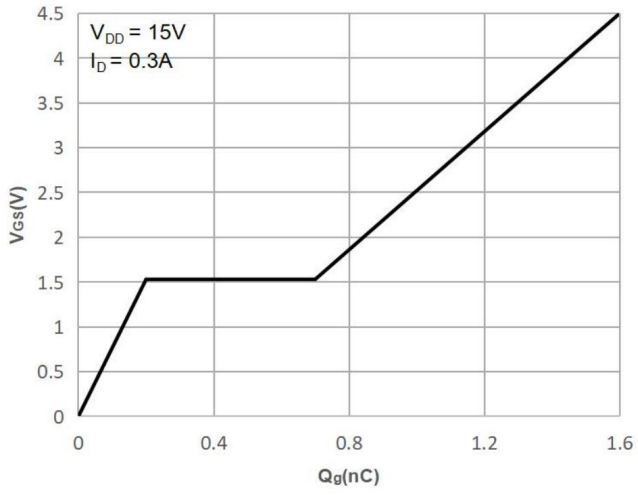
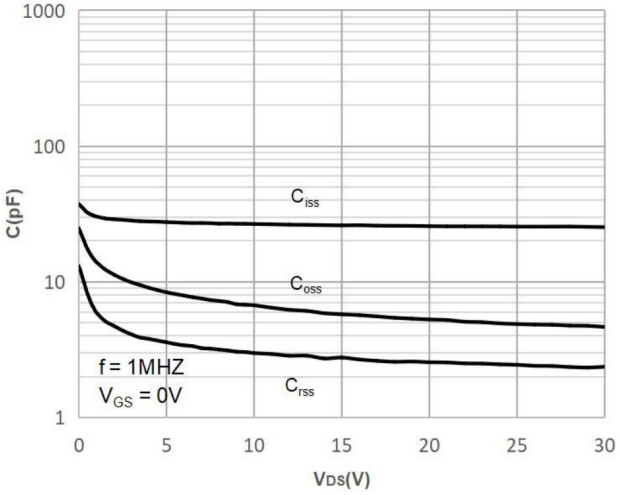


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

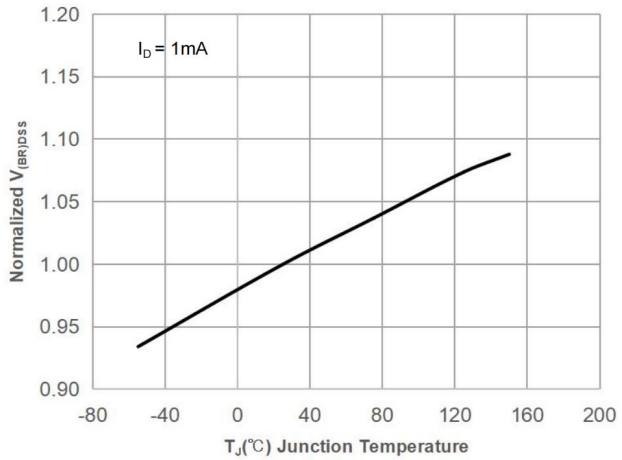


Figure 8: Normalized on Resistance vs. Junction Temperature

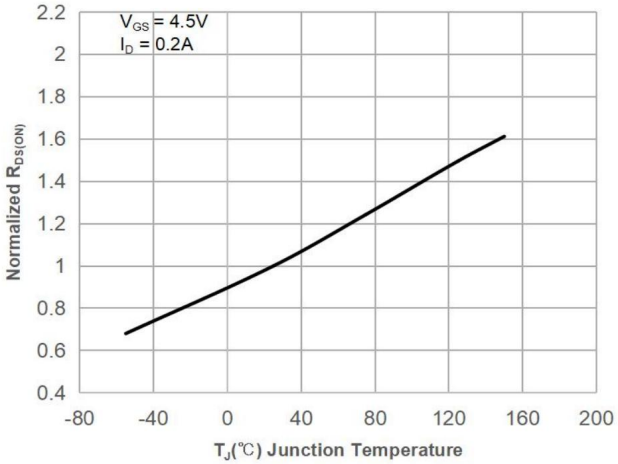


Figure 9: Maximum Safe Operating Area

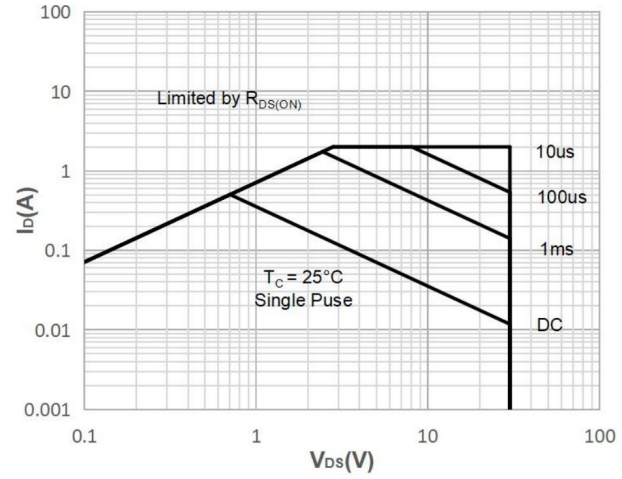


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

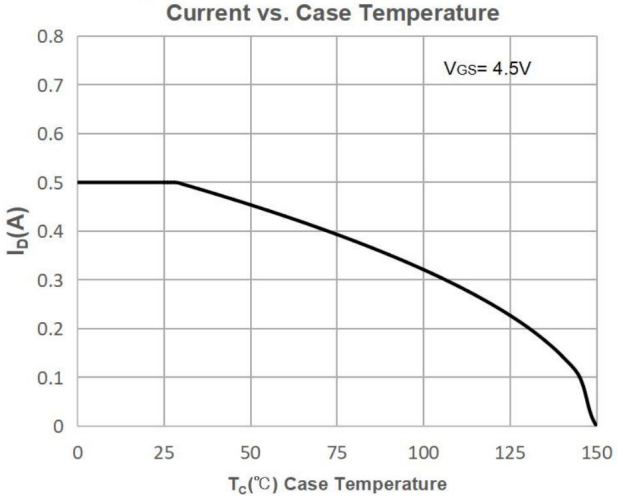


Figure 11: Normalized Maximum Transient Thermal Impedance

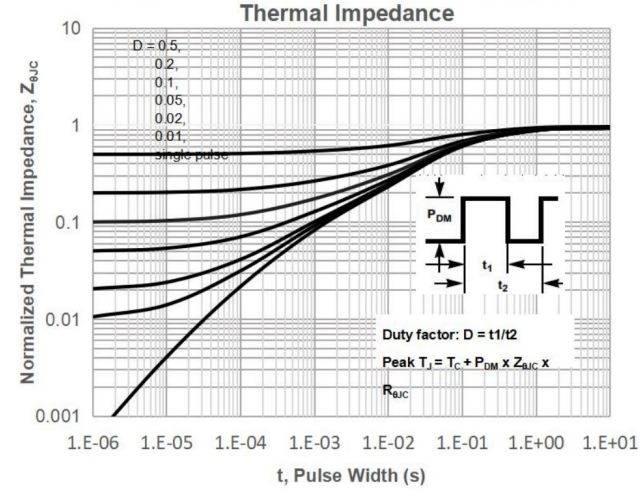
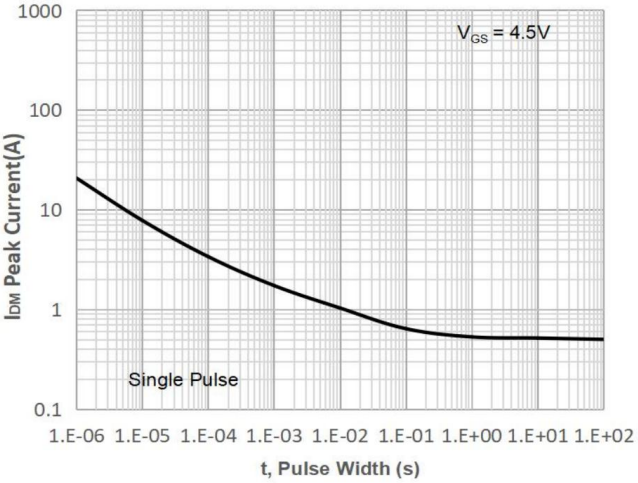
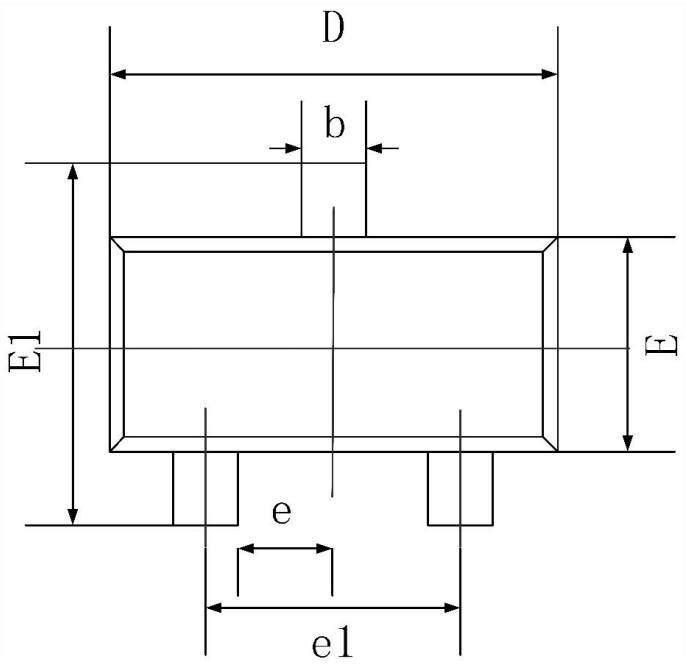
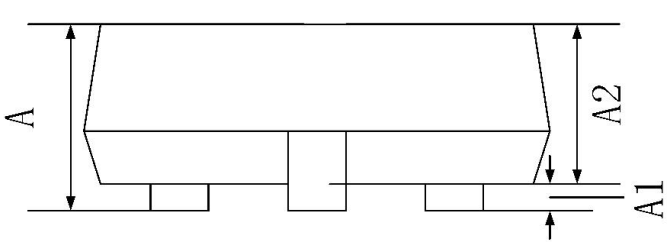


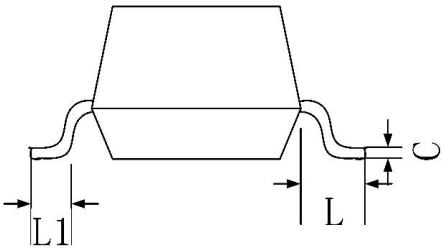
Figure 12: Peak Current Capacity



SOT-23 Package Information







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
C	0.080	0.200	0.003	0.008
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020