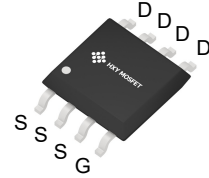




### Description

The BSO220N03MSGXUMA1 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V This device is suitable for use as a Battery protection or in other Switching application.



SOP-8  
(SOIC-8)

### General Features

$V_{DS} = 30V$   $I_D = 9A$

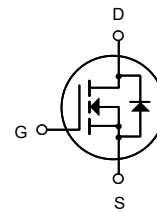
$R_{DS(ON)} < 20m\Omega$  @  $V_{GS}=10V$

### Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

### Ordering Information

Product ID	Pack	Brand	Qty(PCS)
BSO220N03MSGXUMA1	SOP-8(SOIC-8)	HXY MOSFET	3000

### Absolute Maximum Ratings( $T_A = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_A=25^\circ C$	Continuous Drain Current	9	A
$I_D@T_A=100^\circ C$	Continuous Drain Current	5.4	A
$I_{DM}$	Pulsed Drain Current	30	A
EAS	Single Pulse Avalanche Energy	20	mJ
$I_{AS}$	Avalanche Current	20	A
$P_D@T_A=25^\circ C$	Total Power Dissipation	3.1	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup> ( $t \leq 10s$ )	113	$^\circ C/W$
	Thermal Resistance Junction-ambient	25	$^\circ C/W$



**Electrical Characteristics ( $T_J=25\text{ }^\circ\text{C}$ , unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=30V$	---	---	1	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.7	2.2	V
$R_{DS(on)}$	Drain-Source On Resistance <sup>4</sup>	$V_{GS}=10V, I_D=5.5A$	---	16	20	m $\Omega$
		$V_{GS}=4.5V, I_D=4.5A$	---	24	30	m $\Omega$
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	---	484	---	pF
$C_{oss}$	Output Capacitance		---	68	--	
$C_{rss}$	Reverse Transfer Capacitance		---	52	---	
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V, I_D=5A,$ $R_{ENG}=3\Omega, V_{GS}=10V$	---	3	---	ns
$t_r$	Rise Time		---	10	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	13	---	ns
$t_f$	Fall Time		---	1	---	ns
$Q_g$	Total Gate Charge	$V_{GS}=10V,$ $V_{DS}=15V, I_D=5A$	---	9	---	nc
$Q_{gs}$	Gate-Source Charge		---	1	---	nc
$Q_{gd}$	Gate-Drain "Miller" Charge		---	1	---	nc
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=5.8A$	---	---	1.2	V
$I_S$	Continuous Drain Current	$V_D=V_G=0V$	---	---	9	A
$I_{SM}$	Pulsed Drain Current		---	---	30	A
$T_{rr}$	Reverse Recovery Time	$I_F=5A, T_J=25^\circ C$ di/	---	7.5	---	ns
$Q_{rr}$	Reverse Recovery Charge	$dt=100A/us$	---	2	---	nc

**Notes:**

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2.  $R_{\theta JA}$  is measured with the device mounted on a 1inch<sup>2</sup> pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$ .



## Typical Characteristics

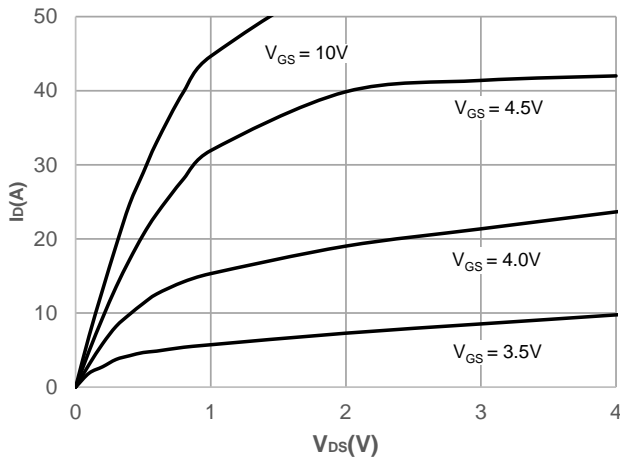


Figure 1: Output Characteristics

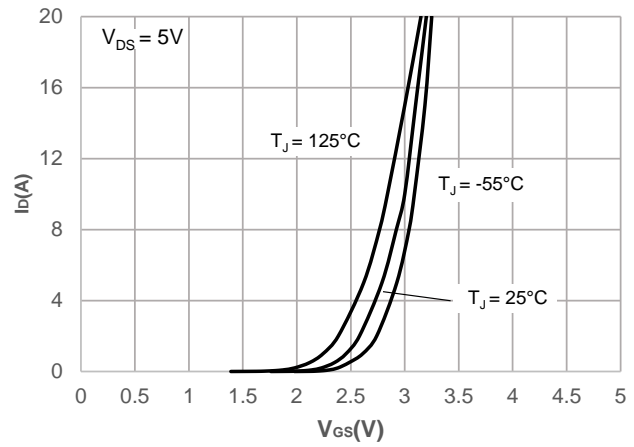


Figure 2: Typical Transfer Characteristics

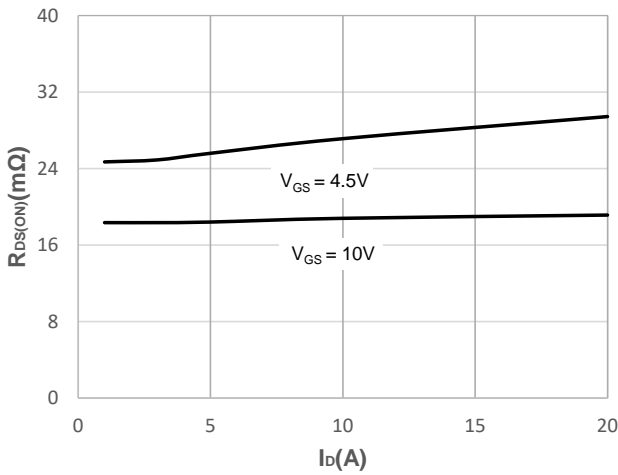


Figure 3: On-resistance vs. Drain Current

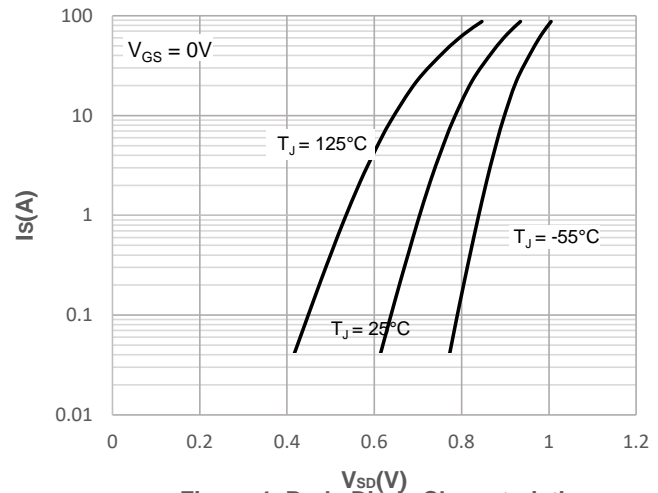


Figure 4: Body Diode Characteristics

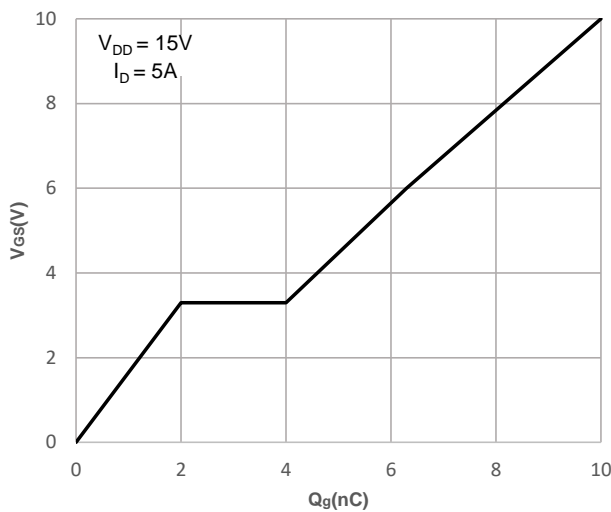


Figure 5: Gate Charge Characteristics

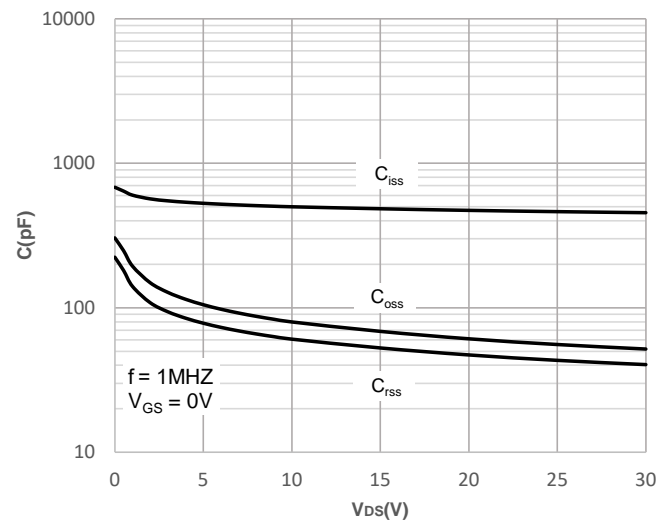


Figure 6: Capacitance Characteristics

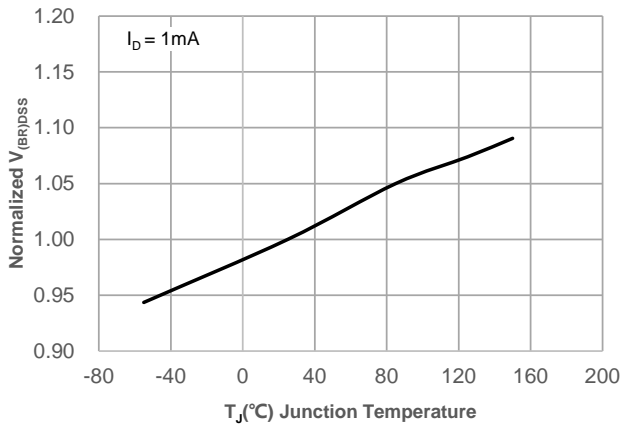


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

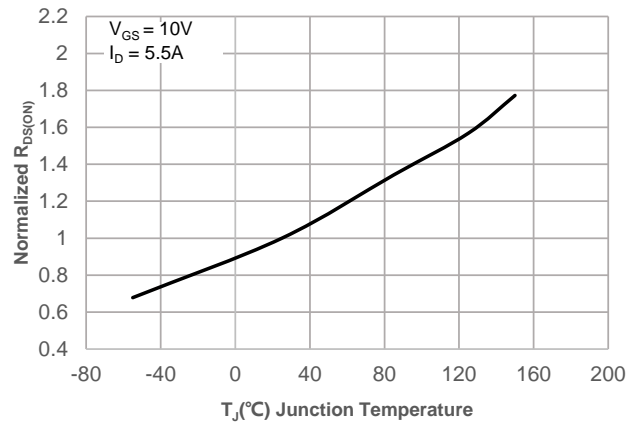


Figure 8: Normalized on Resistance vs. Junction Temperature

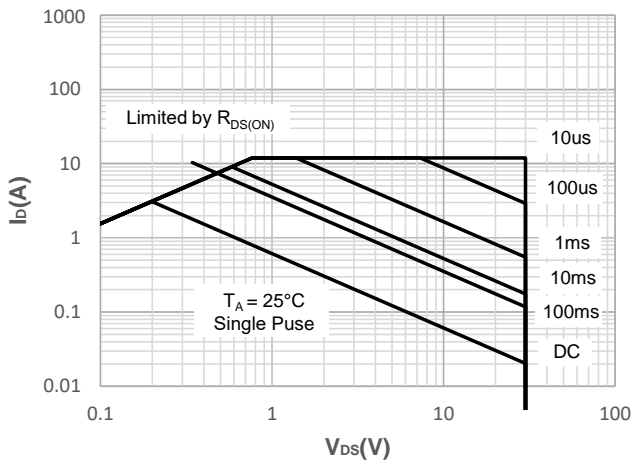


Figure 9: Maximum Safe Operating Area

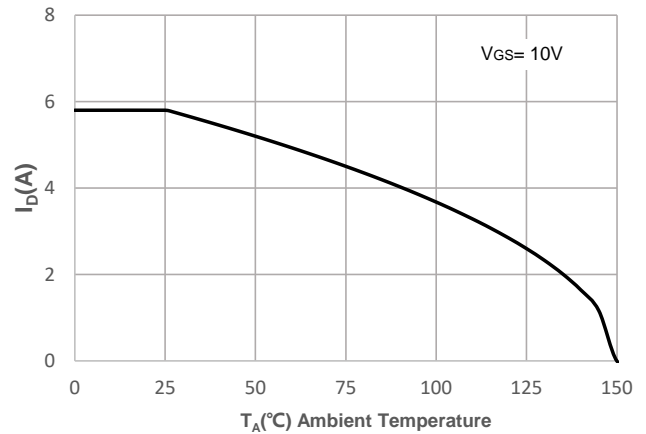


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

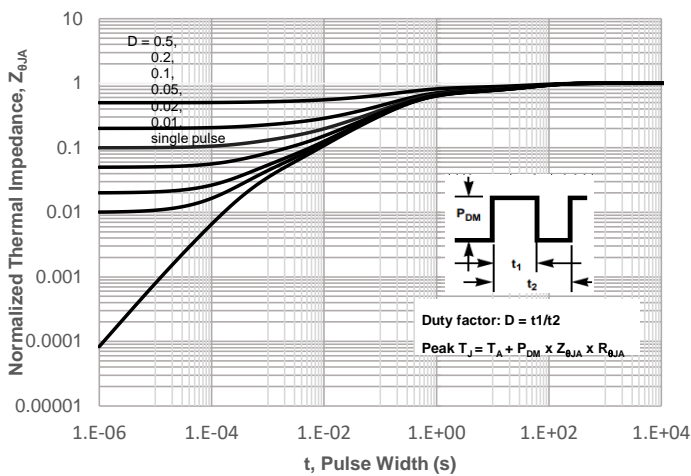


Figure 11: Normalized Maximum Transient Thermal Impedance

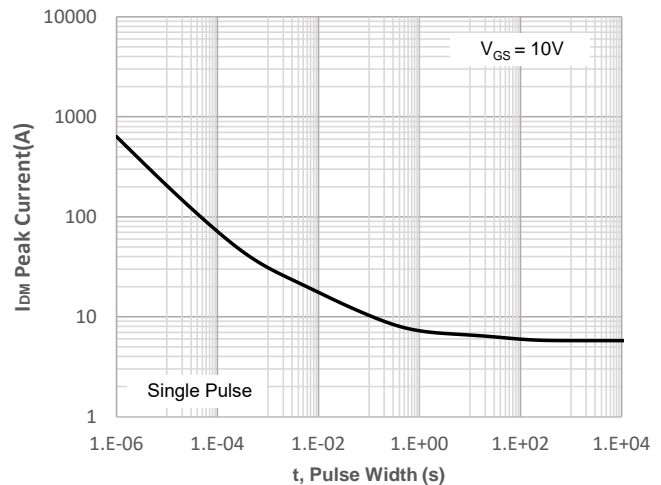
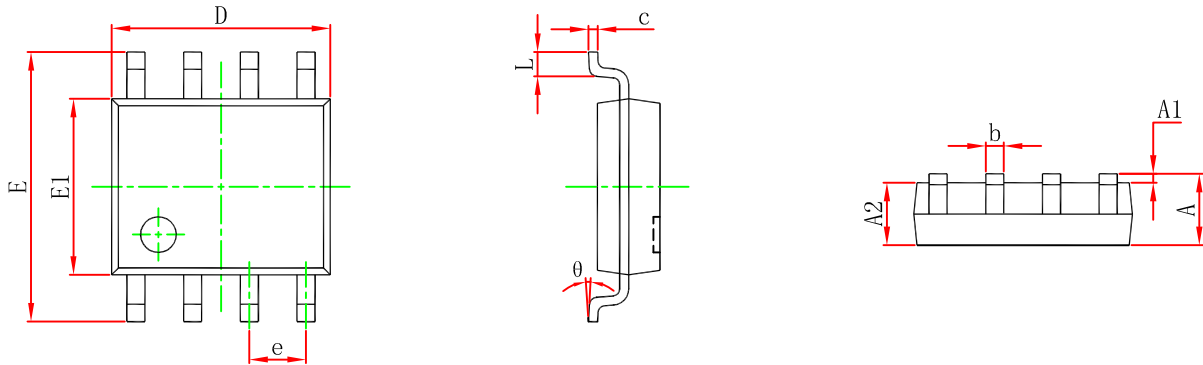


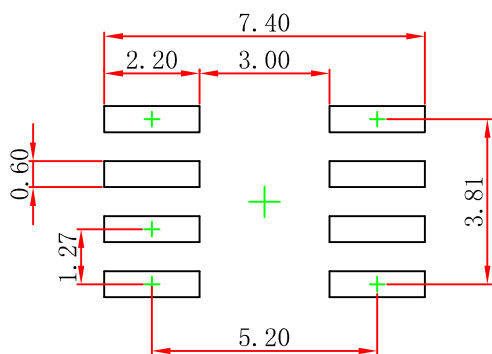
Figure 12: Peak Current Capacity



SOP-8(SOIC-8) Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Note:  
 1. Controlling dimension: in millimeters.  
 2. General tolerance: ± 0.05mm.  
 3. The pad layout is for reference purposes only.



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