

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

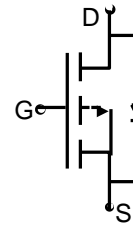
- V_{DS} 100V
- I_D 200mA
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <5.0ohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <5.5ohm

General Description

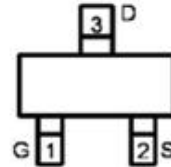
- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- High density cell design for low $R_{DS(ON)}$
- Fast Switching Speed

Applications

- Small servo motor control
- Power MOSFET gate drivers
- Switching application



Schematic diagram



Marking and pin Assignment



SOT23 top view

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

Parameter	Symbol	Limit	Unit	
Drain-source Voltage	V_{DS}	100	V	
Gate-source Voltage	V_{GS}	± 20	V	
Drain Current	I_D	$T_A=25^{\circ}C$ @ Steady State	200	mA
		$T_A=70^{\circ}C$ @ Steady State	160	
Pulsed Drain Current ^A	I_{DM}	800	mA	
Total Power Dissipation @ $T_A=25^{\circ}C$	P_D	350	mW	
Thermal Resistance Junction-to-Ambient @ Steady State ^B	$R_{\theta JA}$	357	$^{\circ}C/W$	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	$^{\circ}C$	

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
BSS123	F2	B123.	3000	30000	120000	7" reel

■ Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS1}	V _{GS} = ±20V, V _{DS} =0V			±100	nA
	I _{GSS2}	V _{GS} = ±10V, V _{DS} =0V			±50	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.0	1.8	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D =200mA		3.0	5.0	Ω
		V _{GS} = 4.5V, I _D =175mA		3.5	5.5	
Diode Forward Voltage	V _{SD}	I _S =200mA, V _{GS} =0V			1.2	V
Maximum Body-Diode Continuous Current	I _S				200	mA
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHZ		14		pF
Output Capacitance	C _{oss}			10		
Reverse Transfer Capacitance	C _{rss}			5		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =0.2A		1.8	2.5	nC
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =50V, I _D =0.2A, R _{GEN} =6Ω		1.7		ns
Turn-on Rise Time	t _r			9		
Turn-off Delay Time	t _{D(off)}			17		
Turn-off fall Time	t _f			7		

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

■ Typical Performance Characteristics

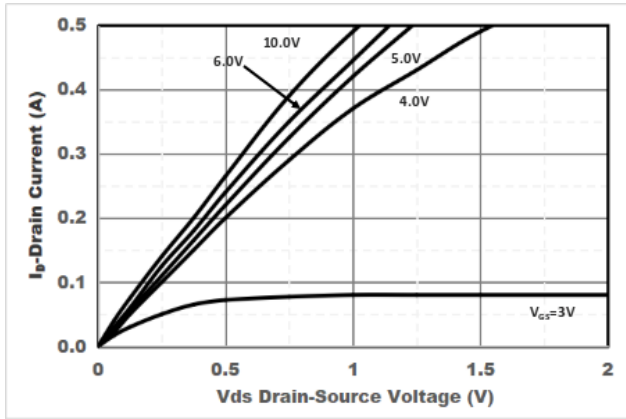


Figure1. Output Characteristics

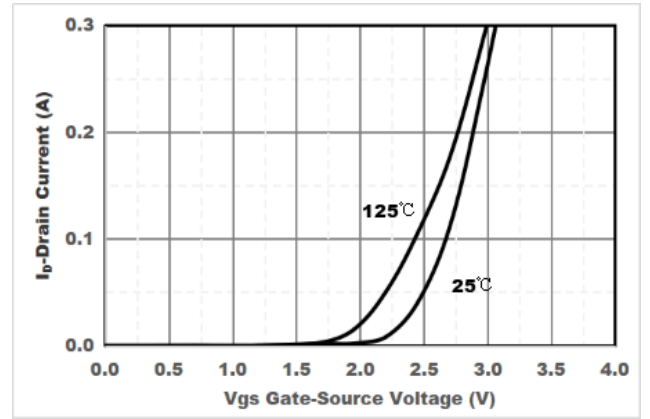


Figure2. Transfer Characteristics

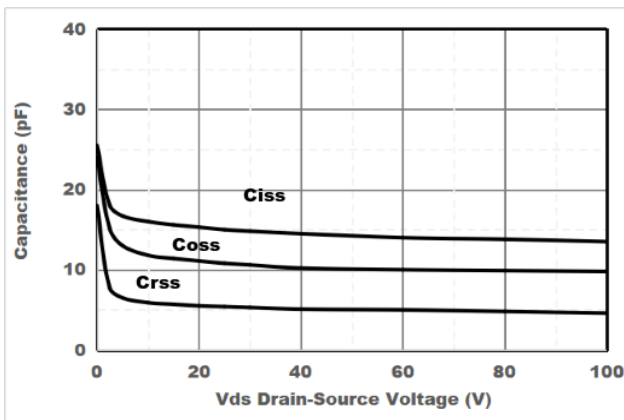


Figure3. Capacitance Characteristics

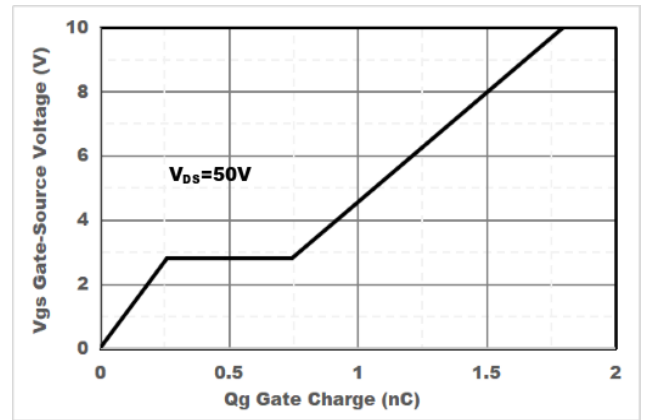


Figure4. Gate Charge

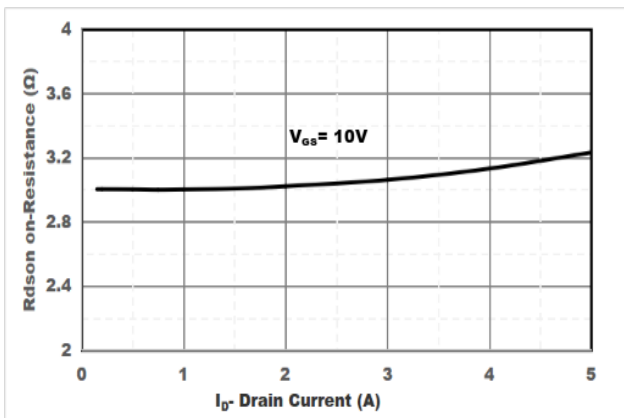


Figure5. Drain-Source on Resistance

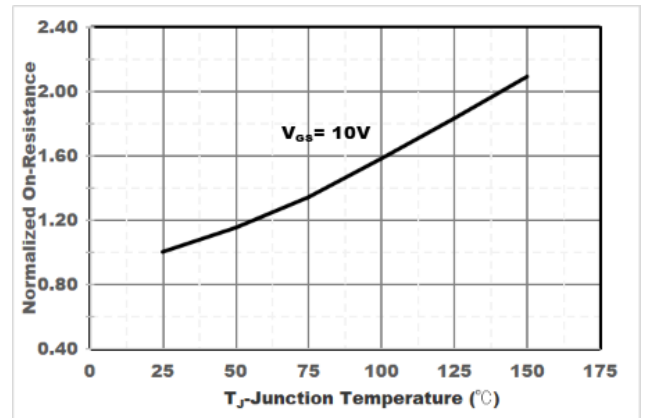


Figure6. Drain-Source on Resistance

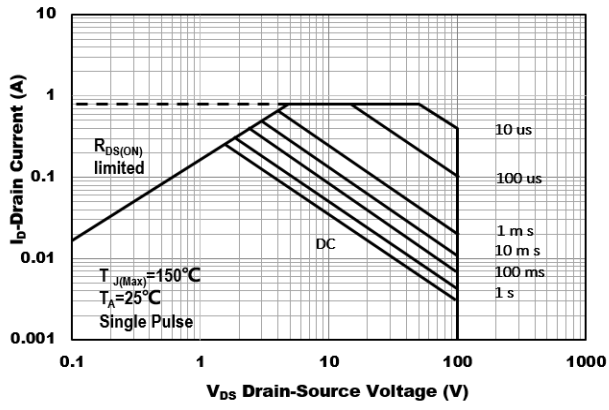


Figure7. Safe Operation Area

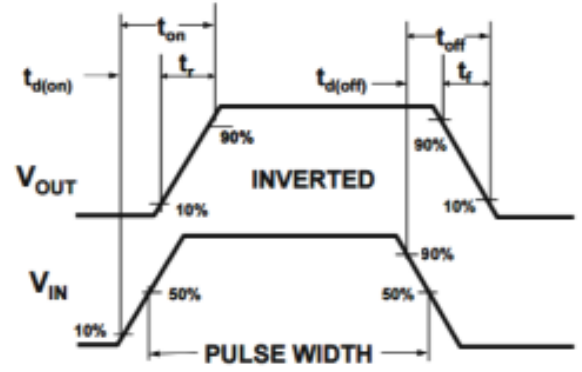
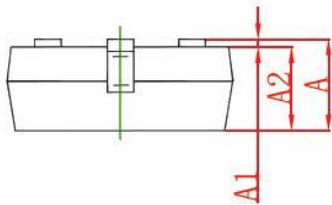
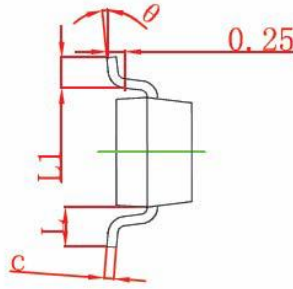
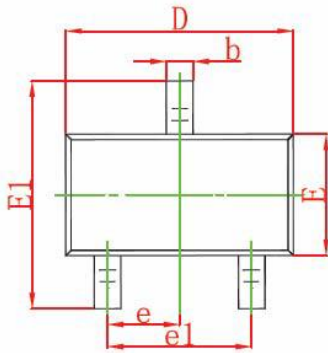
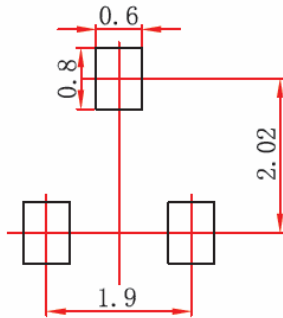


Figure8. Switching wave

■ 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	0.150	0.003	0.006
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
θ	0°	8°	0°	8°

■ SOT-23 Suggested Pad Layout

Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

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