

BSS138BKS

N-Channel MOSFET

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Product Summary

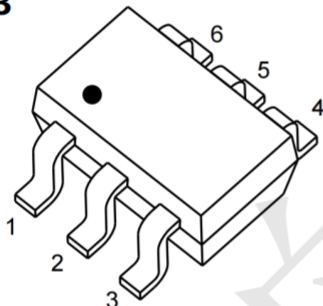
- V_{DS} 50 V
- I_{DS} 0.36A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<2\Omega$
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) $<2.5\Omega$

Application

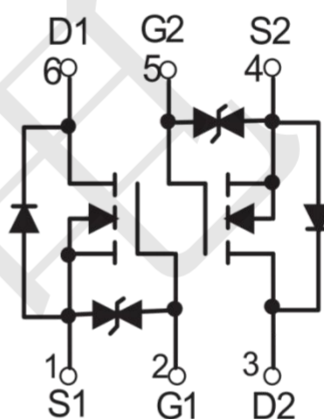
- Reverse Battery protection
- Load switch
- Power management
- Motor Control

Package and Pin Configuration

SOT363



Circuit diagram



Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	0.36	A
Pulsed Drain Current (tp = 10μs)	I_{DM}	1.5	A
Total Power Dissipation	P_{DTOT}	0.35	W
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{stg}	-55 to +150	°C

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	R_{thJA}	833	°C/W

Note : When mounted on 1" square PCB (FR4 material).

Electrical Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D= 250\mu A$	BV_{DSS}	50	--	--	V
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D= 250\mu A$	$V_{GS(th)}$	0.8	1.0	1.5	V
Gate-Source Leakage	$V_{DS}=0V, V_{GS}= \pm 10V$	I_{GSS}	--	--	± 10	μA
Zero Gate Voltage Drain Current	$V_{DS}= 20V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
	$V_{DS}= 20V, T_J=125^{\circ}C$		--	--	50	μA
Drain-Source On-State Resistance (Note 1)	$V_{GS}= 10V, I_D= 0.5A$	$R_{DS(on)}$	--	1.5	2.0	Ω
	$V_{GS}= 4.5V, I_D= 0.2A$		--	1.7	2.5	
	$V_{GS}= 2.5V, I_D= 0.1A$		--	2.0	4.5	
Forward Transconductance (Note 2)	$V_{DS}= 10V, I_D= 0.5A$	g_{fs}	--	16	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	$V_{DS}= 25V, I_D= 0.2A,$ $V_{GS}= 10V$	Q_g	--	4	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	0.5	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	0.4	--	
Input Capacitance	$V_{DS}= 25V, V_{GS}= 0V,$ $F= 1.0MHz$	C_{iss}	--	32	--	pF
Output Capacitance		C_{oss}	--	6	--	
Reverse Transfer Capacitance		C_{rss}	--	3	--	
Switching						
Turn-On Delay Time (Note 3)	$V_{DS}= 25V, I_D= 0.2A,$ $V_{GS}= 10V,$ $R_{GEN}= 6\Omega$	$t_{d(on)}$	--	2.2	--	nS
Rise Time (Note 3)		t_r	--	19.2	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	6.2	--	
Fall Time (Note 3)		t_f	--	23	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	$V_{GS}= 0V, I_F= 0.2A$	V_{SD}	--	0.8	1.2	V

Notes:

1. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

TYPICAL CHARACTERISTICS

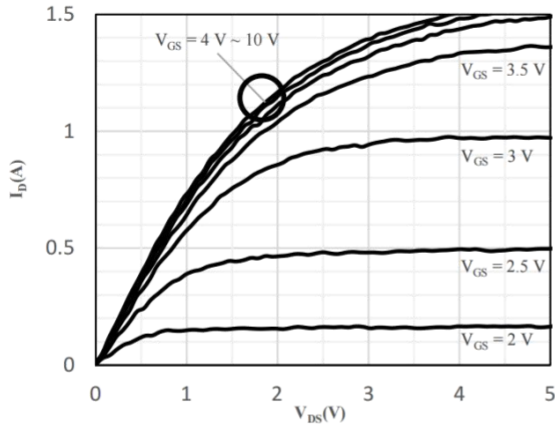


Fig 1 Typical Output Characteristics

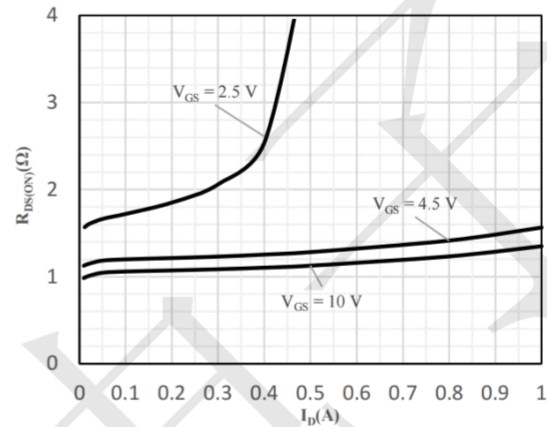


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

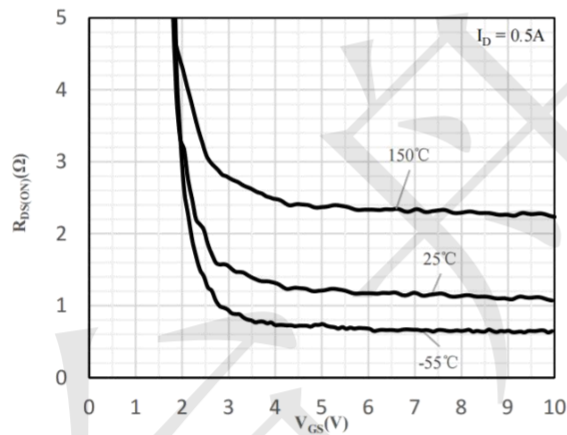


Fig 3 On-Resistance vs. Gate-Source Voltage

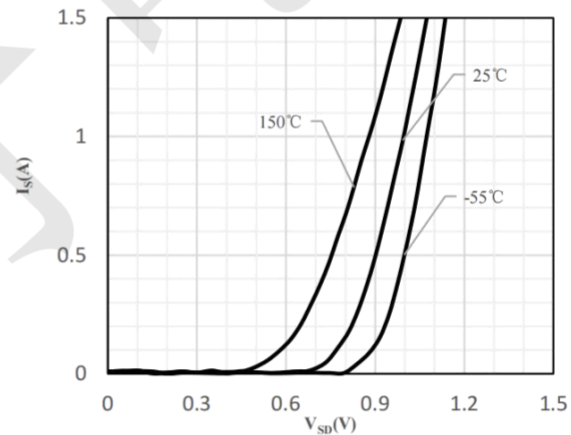


Fig 4 Body-Diode Characteristics

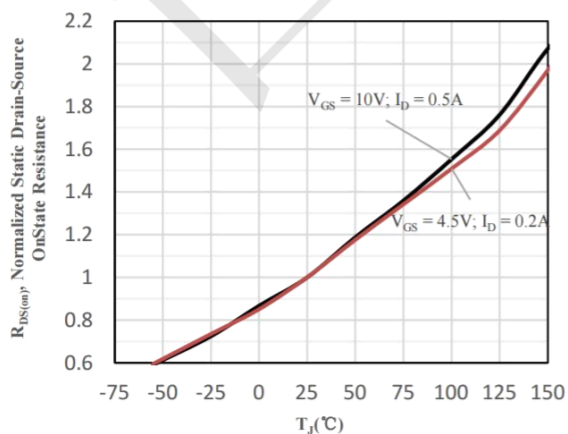


Fig 5 Normalized On-Resistance vs. Junction

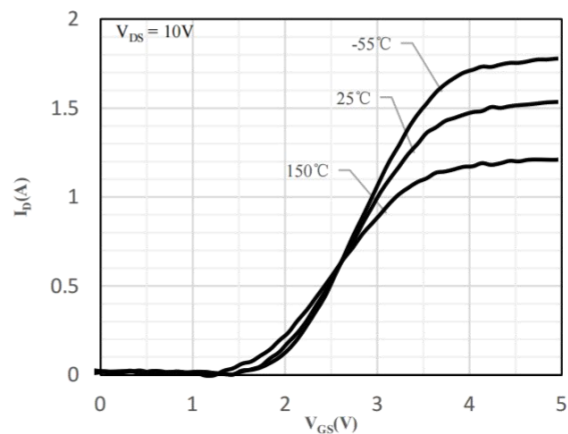
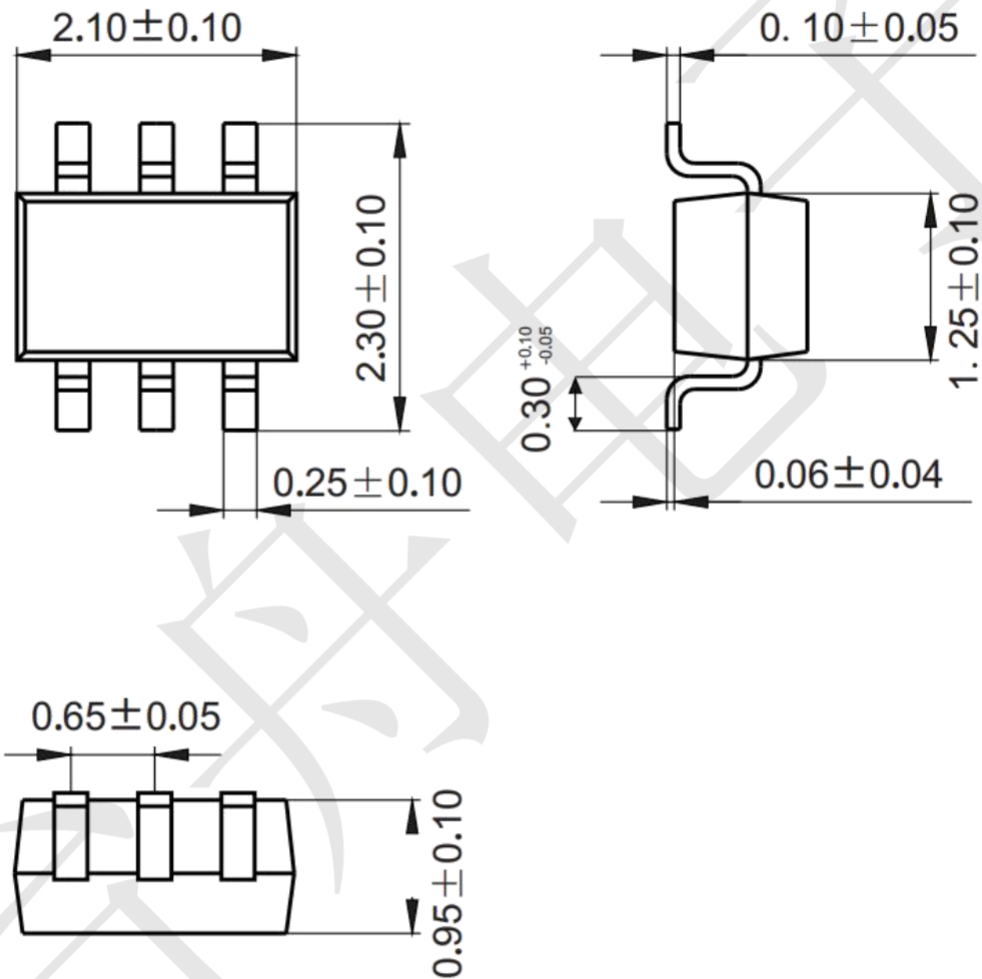


Fig 6 Transfer Characteristics

Package Outline & Dimensions (unit: mm)

SOT-363



Mounting Pad Layout (unit: mm)

