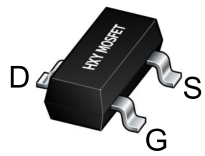
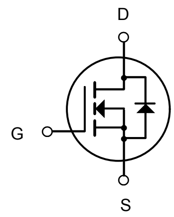
Description

The BSS131 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.



SOT-23



N-Channel MOSFET

General Features

V_{DS} = 240V I_D =0.1A

$R_{DS(ON)}$ < 14Ω@ V_{GS}=10V

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
BSS131	SOT-23	SR	3000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

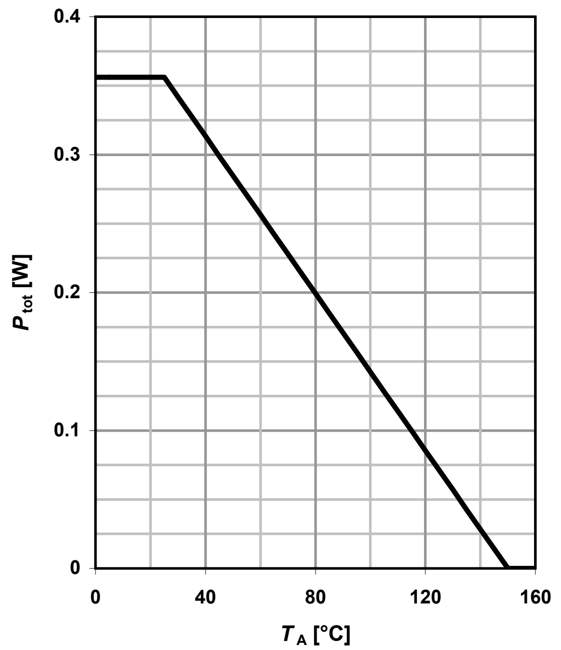
Symbol	Parameter		Limit	Unit
V_{DS}	Drain-Source Voltage		240	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current (T_J =150℃)	T_A =25℃	0.1	A
		T_A =100℃	0.09	
I_{DM}	Drain Current-Pulsed (Note 1)		0.4	A
P_D	Maximum Power Dissipation		0.36	W
T_J,T_{STG}	Operating Junction and Storage Temperature Range		-55 To 150	℃
$R_{θJA}$	Thermal Resistance,Junction-to-Ambient (Note 2)		200	℃/W

Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal resistance, junction - minimal footprint	R_{thJA}		-	-	350	K/W
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=250 μA	240	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=0 V, I_D=56 μA	0.8	1.4	1.8	
Drain-source leakage current	$I_{D\ (off)}$	V_{DS}=240 V, V_{GS}=0 V, T_j=25 °C	-	-	0.01	μA
		V_{DS}=240 V, V_{GS}=0 V, T_j=150 °C	-	-	5	
Gate-source leakage current	I_{GSS}	V_{GS}=20 V, V_{DS}=0 V	-	-	10	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=4.5 V, I_D=0.09 A	-	9.07	20	Ω
		V_{GS}=10 V, I_D=0.1 A	-	7.7	14	
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=0.08 A	0.06	0.13	-	S
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=25 V, f=1 MHz	-	58	77	pF
Output capacitance	C_{oss}		-	7.3	10	
Reverse transfer capacitance	C_{rss}		-	2.8	4.2	
Turn-on delay time	$t_{d(on)}$	V_{DD}=120 V, V_{GS}=10 V, I_D=0.1 A, R_G=6 Ω	-	3.3	5.0	ns
Rise time	t_r		-	3.1	4.6	
Turn-off delay time	$t_{d(off)}$		-	13.7	20	
Fall time	t_f		-	64.5	97	
Gate to source charge	Q_{gs}	V_{DD}=192 V, I_D=0.1 A, V_{GS}=0 to 10 V	-	0.16	0.22	nC
Gate to drain charge	Q_{gd}		-	0.8	1.2	
Gate charge total	Q_g		-	2.1	3.1	
Gate plateau voltage	$V_{plateau}$		-	2.90	-	V
Diode continous forward current	I_S	T_A=25 °C	-	-	0.11	A
Diode pulse current	$I_{S,pulse}$		-	-	0.43	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=0.1 A, T_j=25 °C	-	0.81	1.2	V
Reverse recovery time	t_{rr}	V_R=120 V, I_F=0.1 A, di_F/dt=100 A/μs	-	42.9	64.3	ns
Reverse recovery charge	Q_{rr}		-	22.6	34	nC

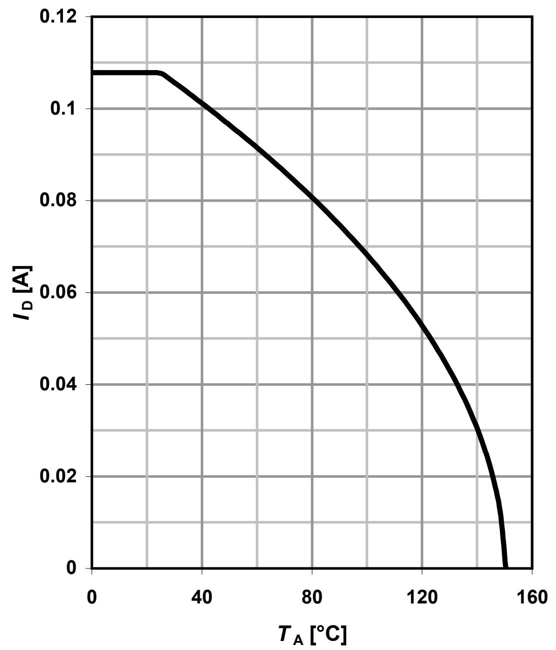
1 Power dissipation

P_{tot}=f(T_A)



2 Drain current

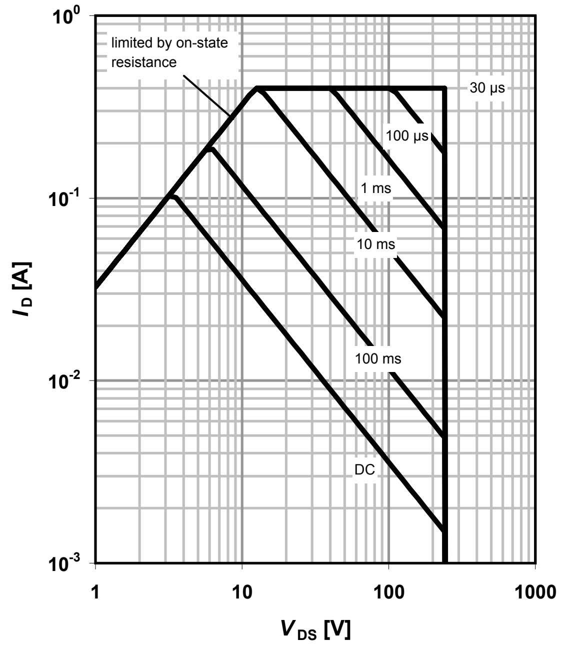
I_D=f(T_A); V_{GS}≥10 V



3 Safe operating area

I_D=f(V_{DS}); T_A=25 °C; D=0

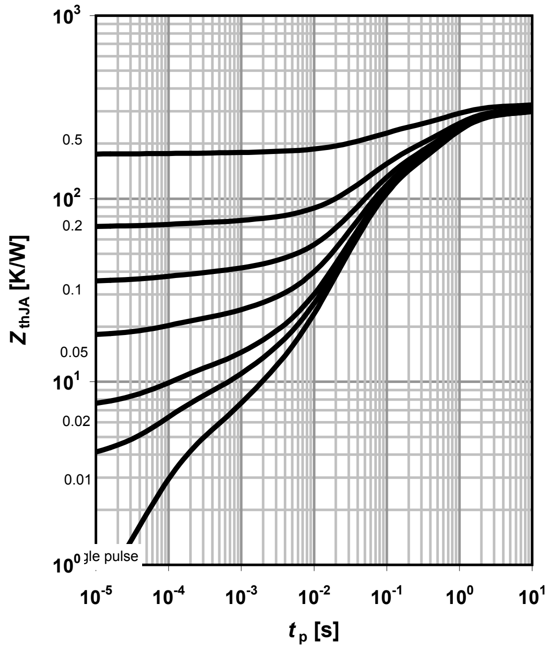
parameter: t_p



4 Max. transient thermal impedance

Z_{thJA}=f(t_p)

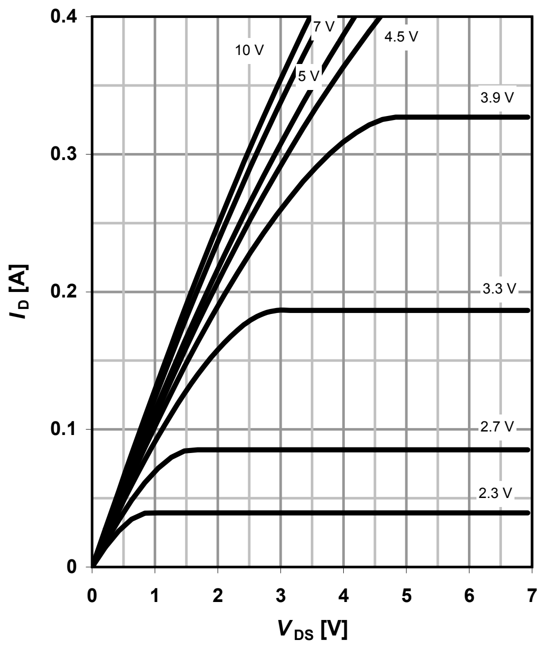
parameter: D=t_p/T



5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C

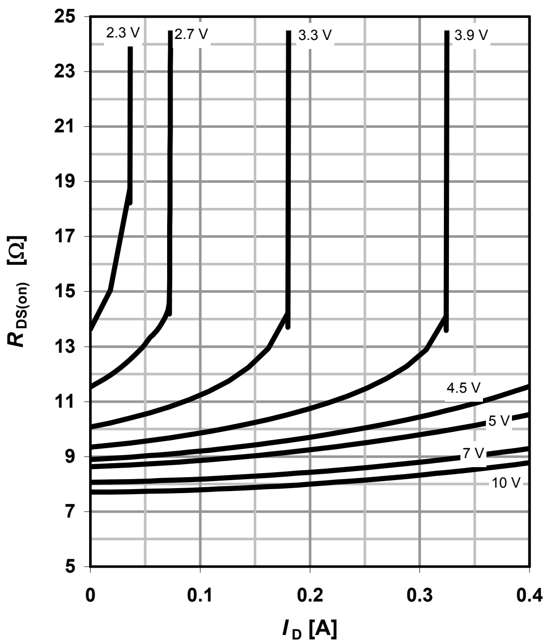
parameter: V_{GS}



6 Typ. drain-source on resistance

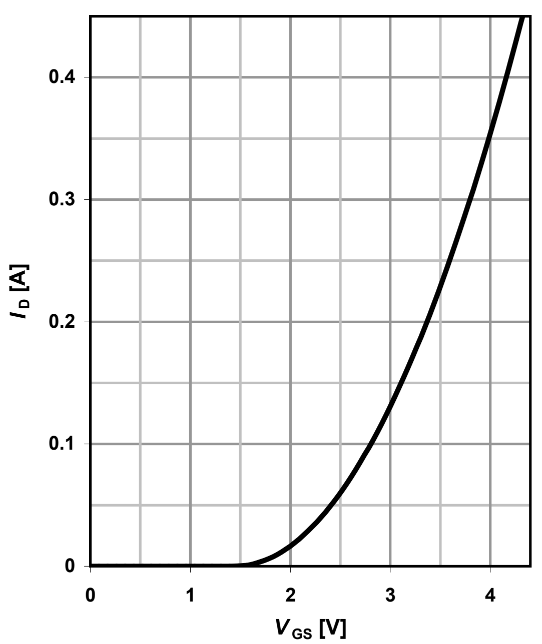
$R_{DS(on)}$=f(I_D); T_j=25 °C

parameter: V_{GS}



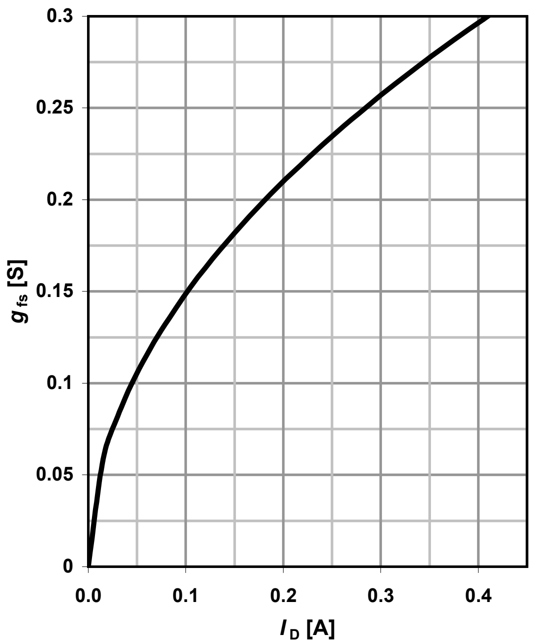
7 Typ. transfer characteristics

I_D=f(V_{GS}); $|V_{DS}|>2|I_D|R_{DS(on)max}$



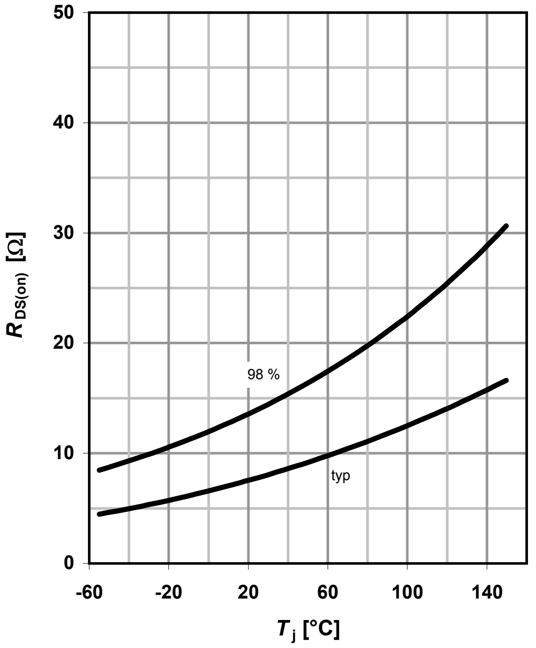
8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C



9 Drain-source on-state resistance

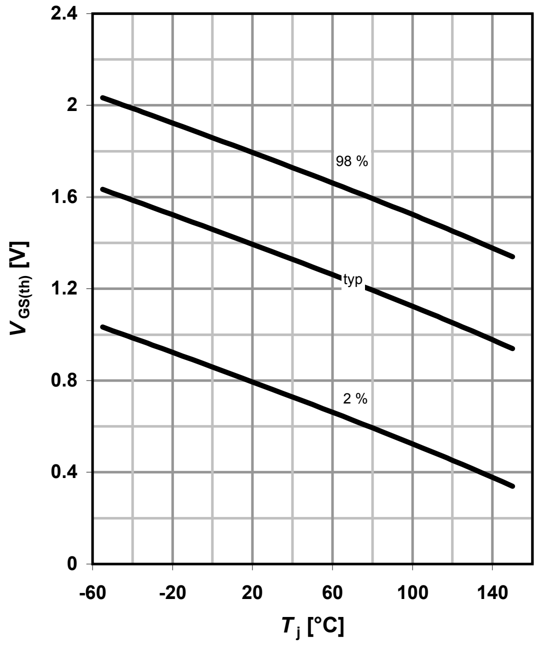
$R_{DS(on)}$=f(T_j); I_D=0.1 A; V_{GS}=10 V



10 Typ. gate threshold voltage

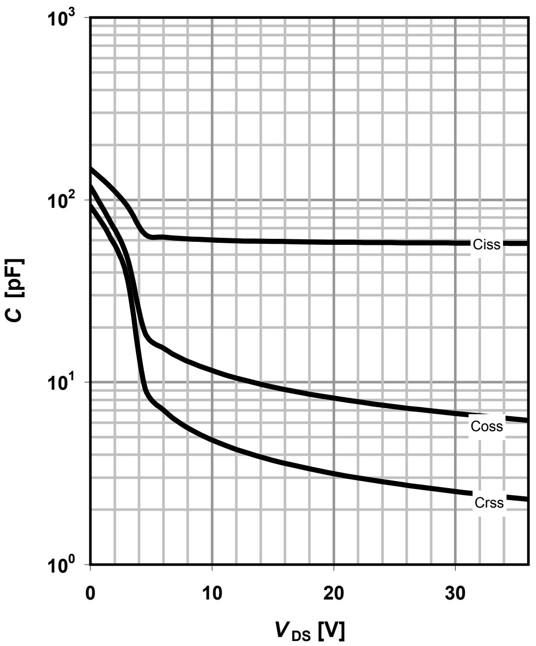
$V_{GS(th)}$=f(T_j); V_{DS}=V_{GS}; I_D=56 µA

parameter: I_D



11 Typ. capacitances

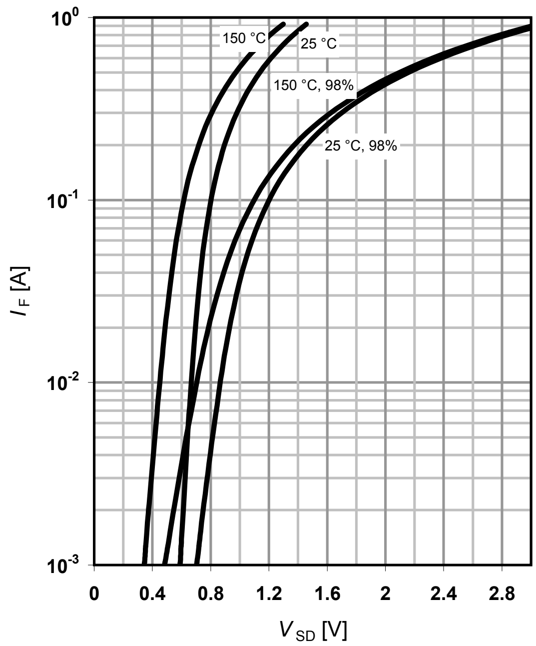
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz; T_j=25°C



12 Forward characteristics of reverse diode

I_F=f(V_{SD})

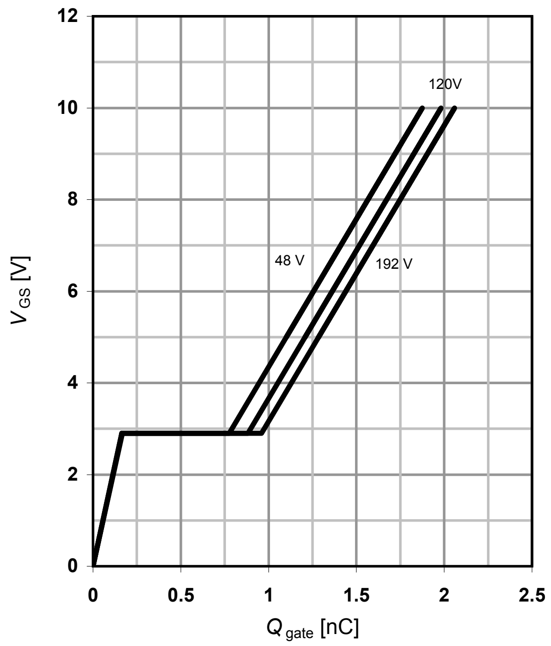
parameter: T_j



13 Typ. gate charge

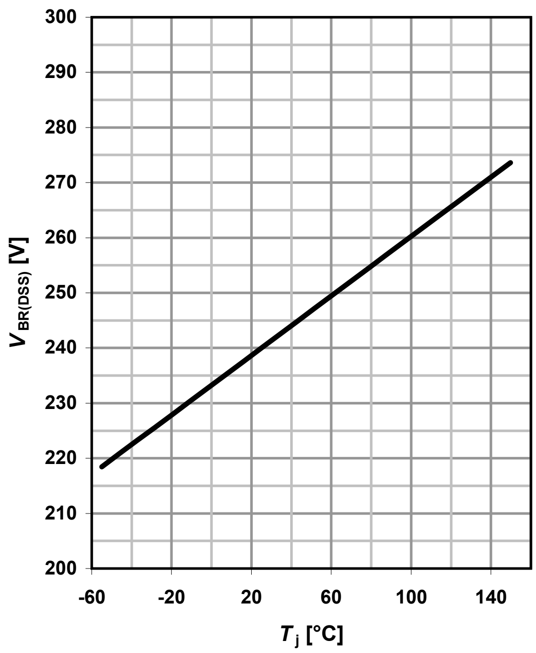
V_{GS}=f(Q_{gate}); I_D=0.1 A pulsed

parameter: V_{DD}

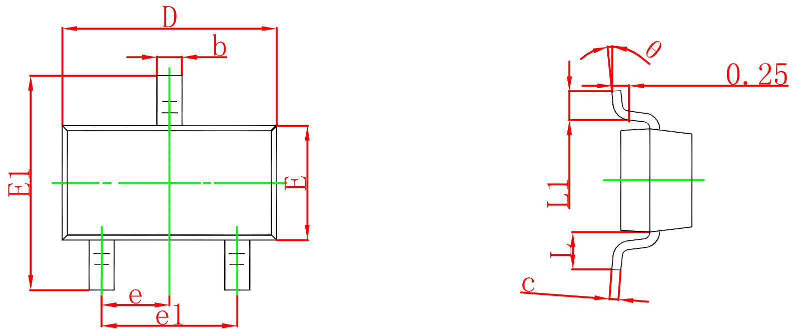


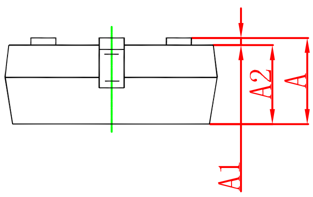
14 Drain-source breakdown voltage

$V_{BR(DSS)}$=f(T_j); I_D=250 μA



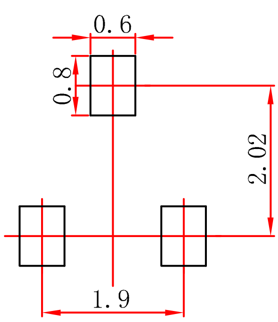
SOT-23 Package Outline Dimensions





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:± 0.05mm.
3.The pad layout is for reference purposes only.

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