SSC138GS7

N-Channel Small Switching MOSFET with ESD Protection

➢ Features

V$_{DS}$	V$_{GS}$	R$_{DS(ON)}$ Typ.	I$_{D}$
50V	±20V	0.6Ω@5V0	0.2A
		0.9Ω@2V75	

➢ Description

This device is an N-Channel enhancement mode MOSFET, with low on-resistance, fast switching speed and low threshold voltage, it is ideal for portable equipment.
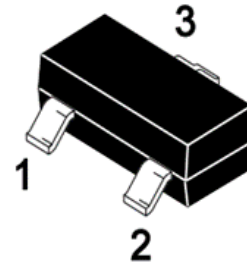
➢ Applications

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers
- Display, Memories, Transistors, etc.
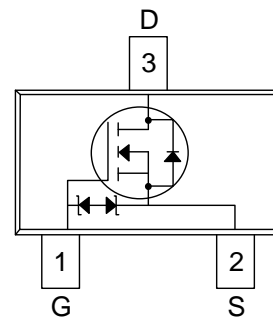- Battery Operated System
- Solid-State Relays

➢ Ordering Information

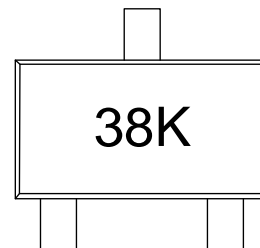| Device	Package	Shipping
SSC138GS7	SOT-323	3000/Reel

➢ Pin configuration

SOT-323

Pin Configuration (Top View)

Marking

➢ **Absolute Maximum Ratings (T$_A$=25℃ unless otherwise noted)**

Symbol	Parameter	Ratings	Unit
V$_{DSS}$	Drain-to-Source Voltage	50	V
V$_{GSS}$	Gate-to-Source Voltage	±20	V
I$_D$	Continuous Drain Current [a]	0.2	A
I$_{DM}$	Pulsed Drain Current [b]	0.8	A
P$_D$	Power Dissipation [c]	0.3	W
T$_J$	Operation junction temperature	-55~150	℃
T$_{STG}$	Storage temperature range	-55~150	℃

➢ **Thermal Resistance Ratings (T$_A$=25℃ unless otherwise noted)**

Symbol	Parameter	Maximum	Unit
R$_{θJA}$	Junction-to-Ambient Thermal Resistance [a]	370	℃/W

Note:

a. The value of R$_{θJA}$ is measured with the device mounted on 1 in^2 FR-4 board with 2oz.copper, in a still air environment with T$_A$=25℃.The value in any given application depends on the user is specific board design. The power dissipation is based on the t≤10s thermal resistance rating.

b. Repetitive rating, pulse width limited by junction temperature.

c. The power dissipation P$_D$ is based on T$_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.
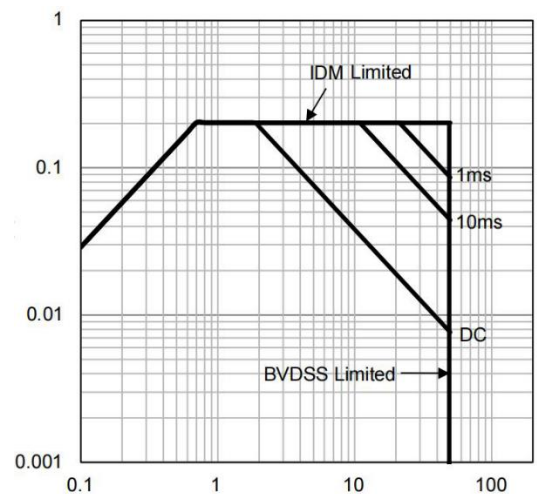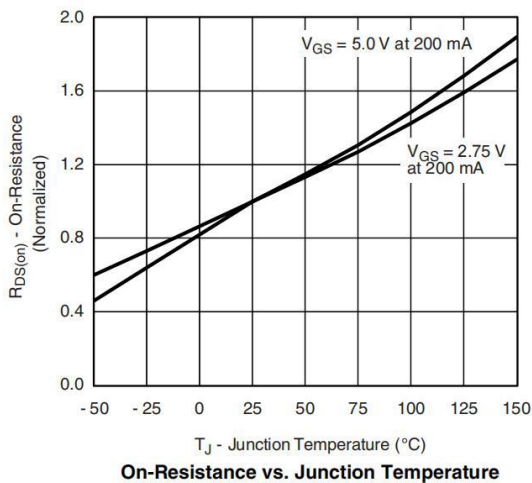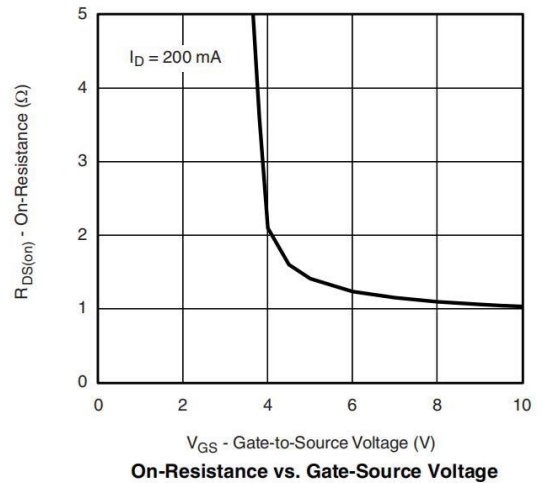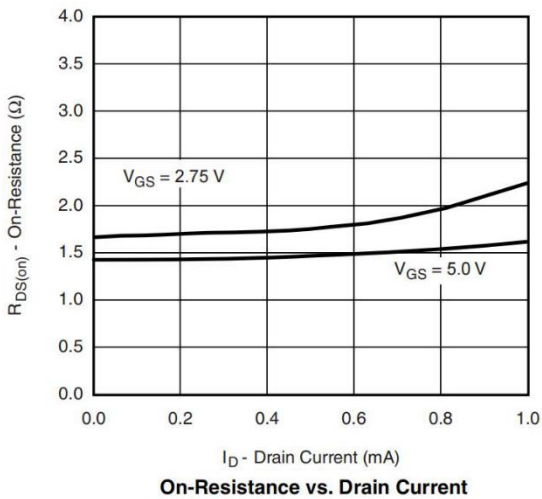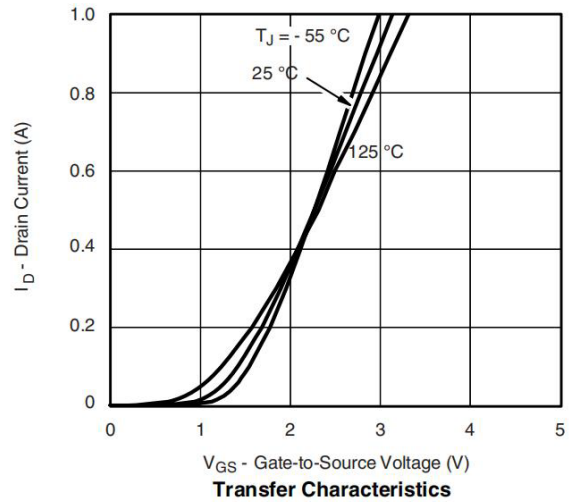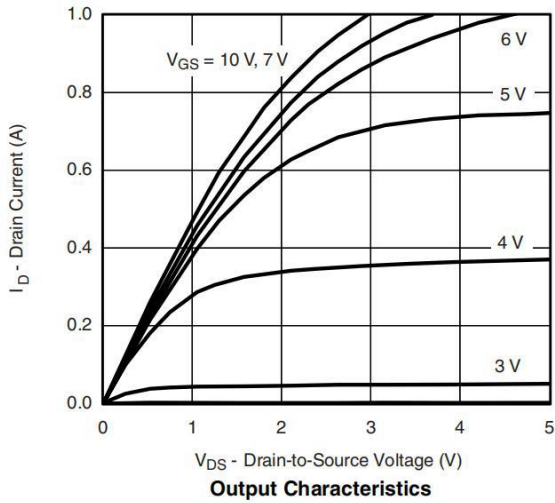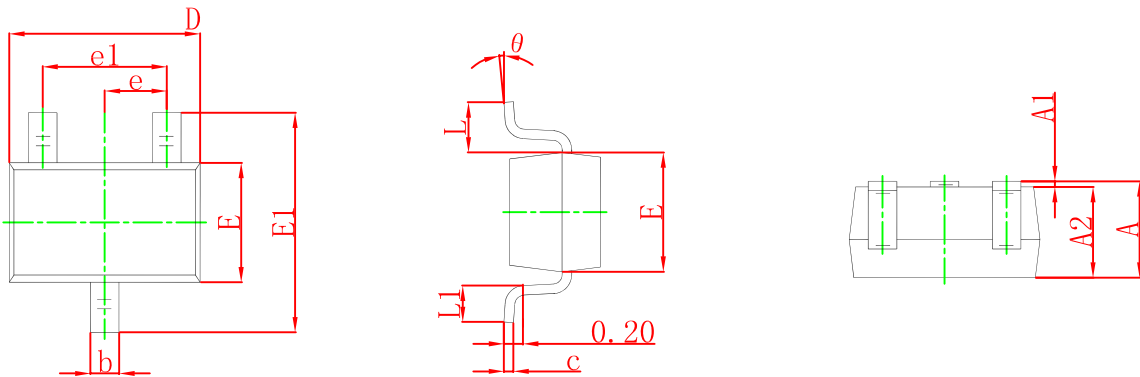
Electrical Characteristics (T$_A$=25℃ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V$_{(BR)DSS}$	V$_{GS}$ = 0V, I$_D$ = 250μA	50			V
Gate Threshold Voltage	V$_{GS(th)}$	V$_{DS}$ = V$_{GS}$, I$_D$ = 250uA	0.5		1.5	V
Drain-Source On-Resistance	R$_{DS(on)}$	V$_{GS}$ = 5V, I$_D$ = 0.2A		0.6	4	Ω
		V$_{GS}$ = 2.75V, I$_D$ = 0.2A		0.9	10	
Zero Gate Voltage Drain Current	I$_{DSS}$	V$_{DS}$ = 50V, V$_{GS}$ = 0V			1	μA
Gate-Source Leak Current	I$_{GSS}$	V$_{GS}$ = ±20V, V$_{DS}$ = 0V			±10	μA
Transconductance	G$_{FS}$	V$_{DS}$ = 10V, I$_D$ = 0.2A	0.1			s
Forward Voltage	V$_{SD}$	V$_{GS}$ = 0V, I$_S$ = 0.2A			1.3	V
Input Capacitance	C$_{ISS}$	V$_{DS}$ = 25V, V$_{GS}$ = 0V, f = 1MHz		27		pF
Output Capacitance	C$_{OSS}$			13		
Reverse Transfer Capacitance	C$_{RSS}$			6		
Turn-on Delay Time	T$_{D(ON)}$	V$_{GS}$ = 10V, R$_L$ = 6Ω V$_{DS}$ = 30V, I$_D$ = 0.2A			5	ns
Rise Time	T$_r$				18	
Turn-off Delay Time	T$_{D(OFF)}$				36	
Fall Time	T$_f$				14	
Total Gate Charge	Q$_G$	V$_{GS}$ = 10V, V$_{DS}$ = 25V, I$_D$ = 0.2A		0.45		nC
Gate to Source Charge	Q$_{GS}$			0.95		
Gate to Drain Charge	Q$_{GD}$			0.10		

> ## Typical Performance Characteristics (T$_A$=25℃ unless otherwise noted)

Output Characteristics

$V_{GS} = 10 V, 7 V$
6 V
5 V
4 V
3 V

I_D - Drain Current (A)
V_{DS} - Drain-to-Source Voltage (V)

Transfer Characteristics

$T_J = -55 °C$
25 °C
125 °C

I_D - Drain Current (A)
V_{GS} - Gate-to-Source Voltage (V)

On-Resistance vs. Drain Current

$V_{GS} = 2.75 V$
$V_{GS} = 5.0 V$

$R_{DS(on)}$ - On-Resistance (Ω)
I_D - Drain Current (mA)

On-Resistance vs. Gate-Source Voltage

$I_D = 200 mA$

$R_{DS(on)}$ - On-Resistance (Ω)
V_{GS} - Gate-to-Source Voltage (V)

On-Resistance vs. Junction Temperature

$V_{GS} = 5.0 V$ at 200 mA
$V_{GS} = 2.75 V$ at 200 mA

$R_{DS(on)}$ - On-Resistance (Normalized)
T_J - Junction Temperature (°C)

IDM Limited
1ms
10ms
DC
BVDSS Limited

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➢ Package Information

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

➢ Suggested Pad Layout
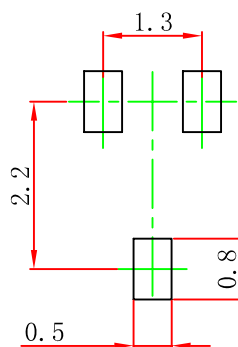
Note:

1.Controlling dimension: in millimeters.

2.General tolerance: ±0.05mm.

3.The pad layout is for reference purposes only.

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