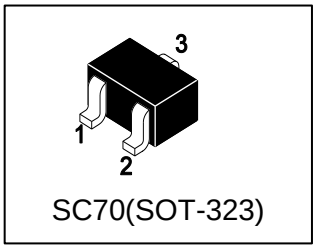
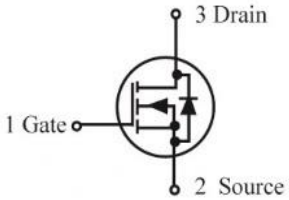
# LBSS138WT1G
# S-LBSS138WT1G

Power MOSFET
200 mAmps, 50V N–Channel SC-70



SC70(SOT-323)




## 1. FEATURES

- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.
- Low threshold voltage (VGS(th): 0.5V...1.5V) makes it ideal for low voltage applications.

## 2. DEVICE MARKING AND ORDERING INFORMATION

| Device | Marking | Shipping |
|---|---|---|
| LBSS138WT1G | J1 | 3000/Tape&Reel |
| LBSS138WT3G | J1 | 10000/Tape&Reel |

## 3. MAXIMUM RATINGS(Ta = 25ºC)

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Drain–Source Voltage | VDSS | 50 | V |
| Gate–to–Source Voltage – Continuous | VGS | ±20 | V |
| Drain Current<br>– Continuous TA = 25°C<br>– Pulsed (tp≤10μs) | <br>ID<br>IDM | <br>200<br>800 | mA |

## 4. THERMAL CHARACTERISTICS

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Total Device Dissipation,<br>FR−5 Board (Note 1) @ TA = 25ºC<br>Derate above 25ºC | PD | 150<br><br>1.8 | mW<br><br>mW/ºC |
| Thermal Resistance,<br>Junction–to–Ambient(Note 1) | RΘJA | 556 | ºC/W |
| Junction and Storage temperature | TJ,Tstg | −55~+150 | °C |
| Maximum Lead Temperature for Solde<br>Purposes, for 10 seconds | TL | 260 | ºC |

1. FR–5 = 1.0×0.75×0.062 in.

## 5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

OFF CHARACTERISTICS

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Drain–Source Breakdown Voltage<br>(VGS = 0, ID = 250μA) | VBRDSS | 50 | - | - | V |
| Zero Gate Voltage Drain Current<br>(VGS = 0, VDS = 25 V)<br>(VGS = 0, VDS = 50 V) | IDSS | -<br>- | -<br>- | 0.1<br>0.5 | μA |
| Gate–Body Leakage Current, Forward<br>(VGS = 20 V) | IGSSF | - | - | 0.1 | μA |
| Gate–Body Leakage Current, Reverse<br>(VGS = - 20 V) | IGSSR | - | - | -0.1 | μA |

ON CHARACTERISTICS (Note 2)

| | | | | | |
|---|---|---|---|---|---|
| Gate Threshold Voltage<br>(VDS = VGS, ID = 1.0mA) | VGS(th) | 0.5 | - | 1.5 | V |
| Static Drain–Source On–State Resistance<br>(VGS = 2.75 V, ID < 200 mA,<br>TA = –40°C to +85°C)<br>(VGS = 5.0 V, ID = 200 mA) | RDS(on) | -<br><br>- | 5.6<br><br>- | 10<br><br>3.5 | Ohms |
| Forward Transconductance<br>(VDS = 25 V, ID = 200 mA, f = 1.0 kHz) | gfs | 100 | - | - | mS |

DYNAMIC CHARACTERISTICS

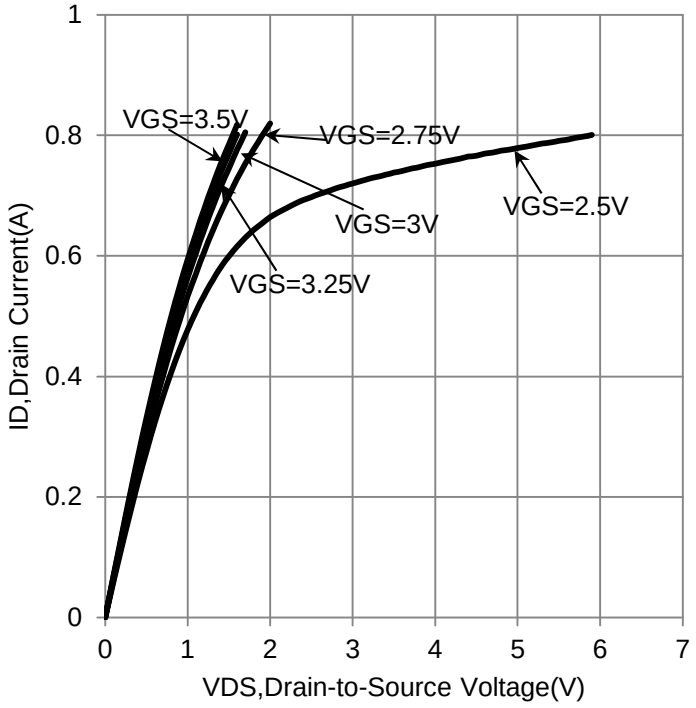
| | | | | | |
|---|---|---|---|---|---|
| Input Capacitance<br>(VDS = 25 V, VGS = 0, f = 1.0 MHz) | Ciss | - | 40 | 50 | pF |
| Output Capacitance<br>(VDS = 25 V, VGS = 0, f = 1.0 MHz) | Coss | - | 12 | 25 | pF |
| Reverse Transfer Capacitance<br>(VDS = 25 V, VGS = 0, f = 1.0 MHz) | Crss | - | 3.5 | 5.0 | pF |

SWITCHING CHARACTERISTICS

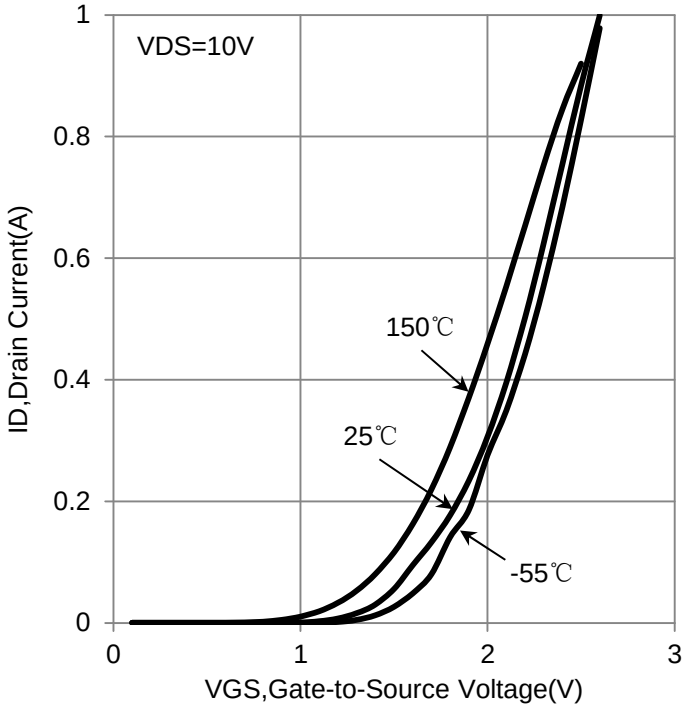
| | | | | | | |
|---|---|---|---|---|---|---|
| Turn-On Delay Time | (VDD = 30 V, ID =200 mA) | td(on) | - | - | 20 | ns |
| Turn-Off Delay Time | | td(off) | - | - | 20 | |

2.Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.

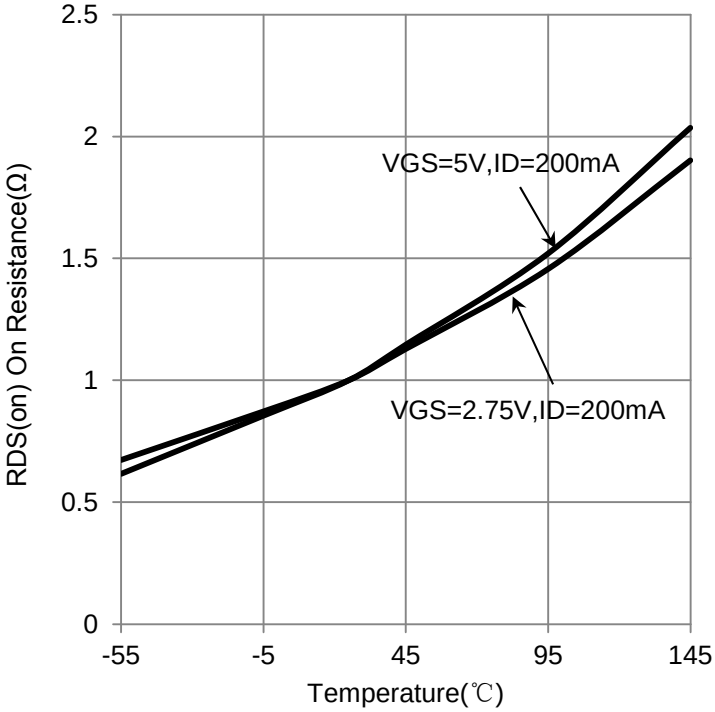
## 6. ELECTRICAL CHARACTERISTICS CURVES



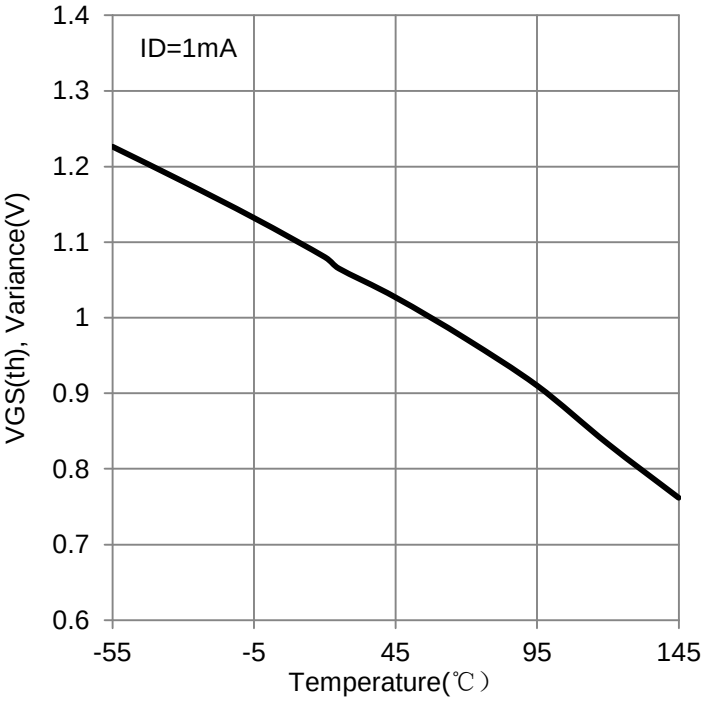

On-Region Characteristics




Transfer Characteristics

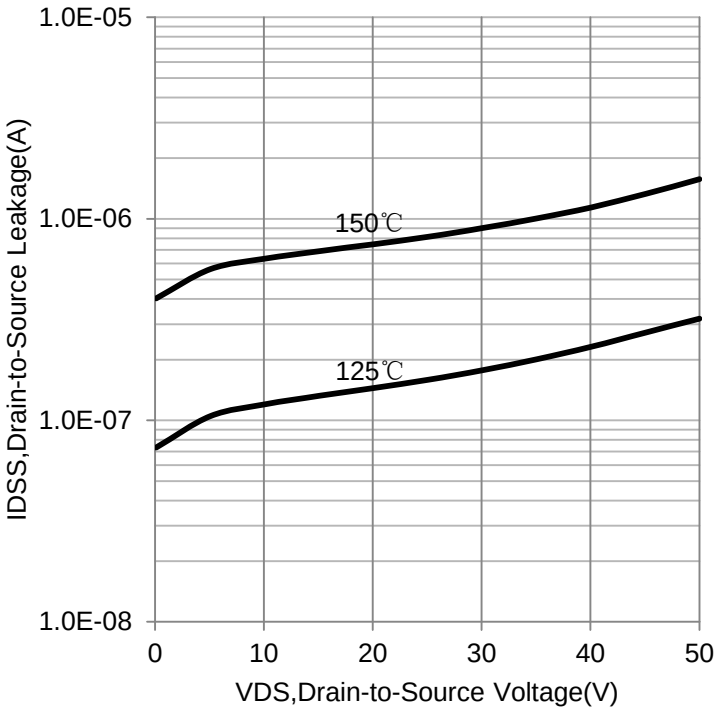



RDS(on) vs. Temperature

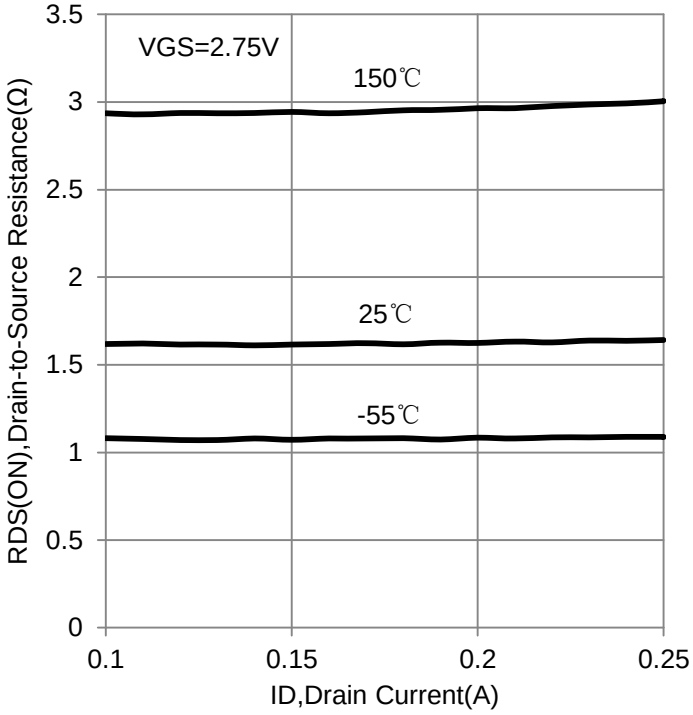



Threshold Voltage vs.Temperature

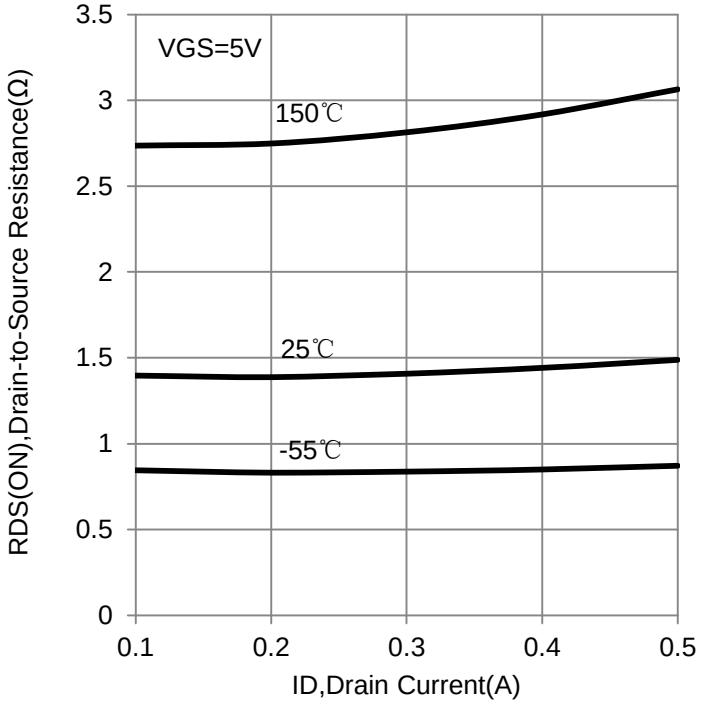
## 6.ELECTRICAL CHARACTERISTICS CURVES(Con.)



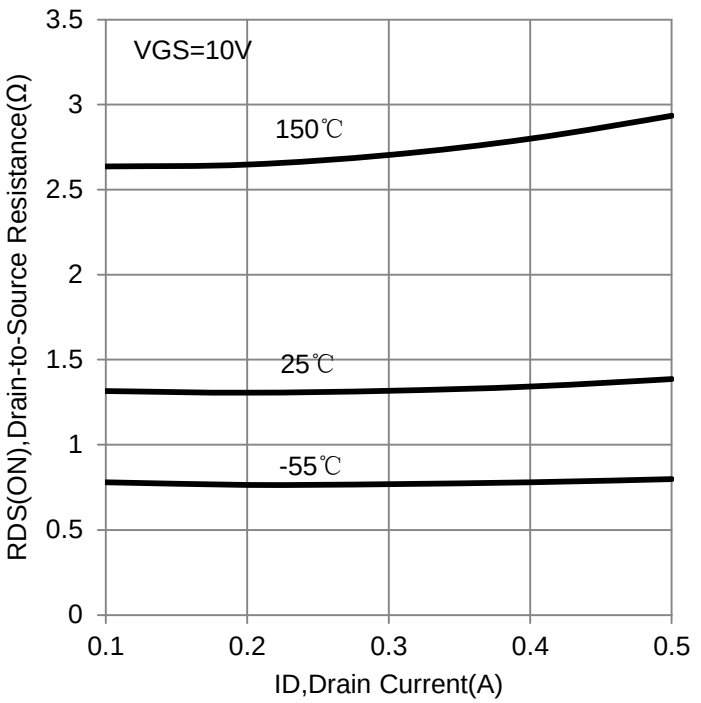

IDSS vs. VDS




RDS(on) vs. ID

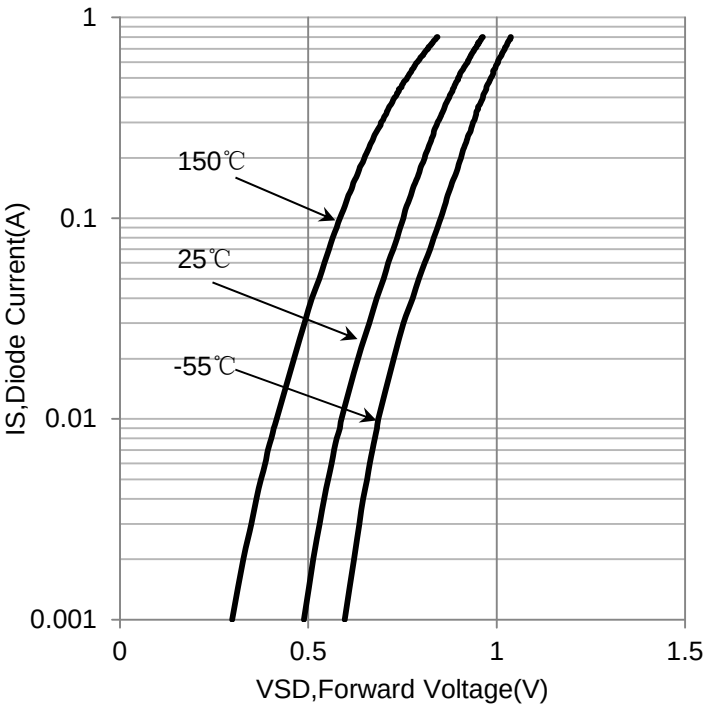



RDS(on) vs. ID

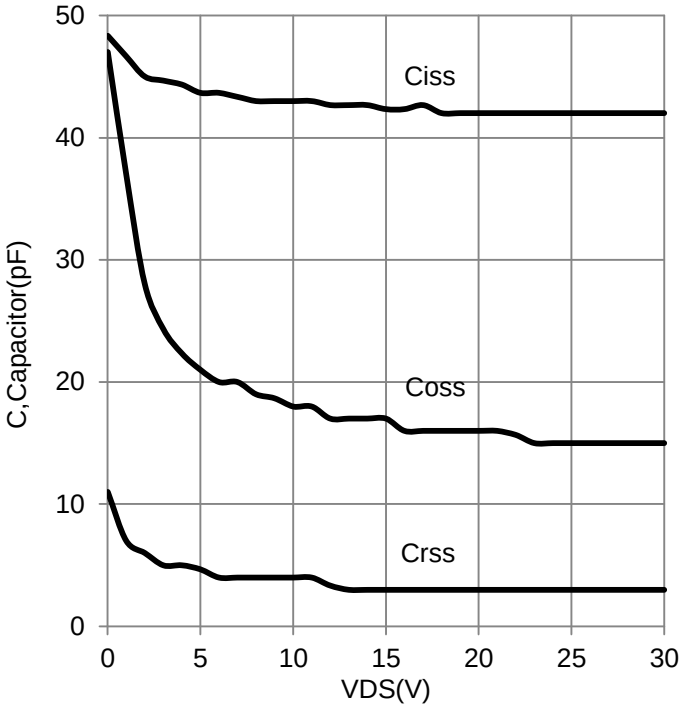



RDS(on) vs. ID

## 6.ELECTRICAL CHARACTERISTICS CURVES(Con.)

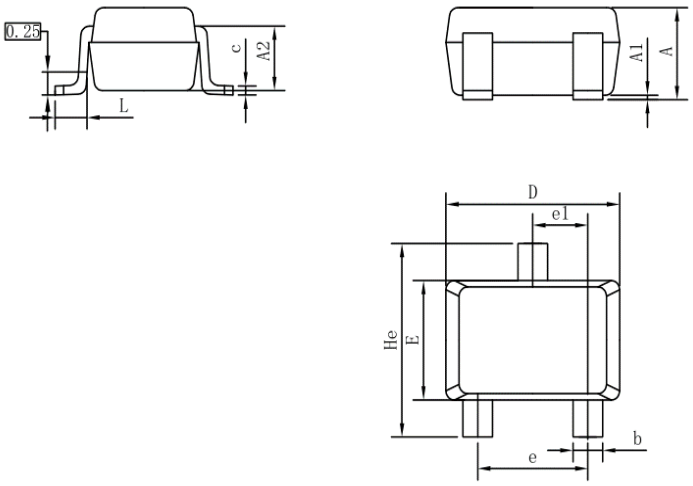



Body Diode Forward Voltage



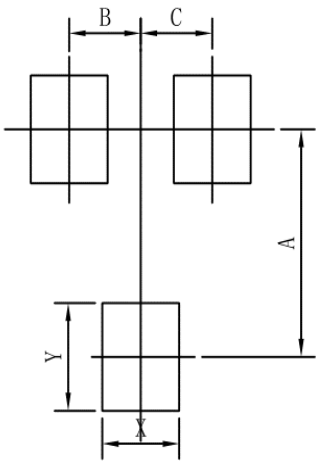

Capacitor vs.VDS

## 7.OUTLINE AND DIMENSIONS




| SC70 | | | |
|---|---|---|---|
| DIM | MIN | NOR | MAX |
| A | 0.80 | 0.95 | 1.00 |
| A1 | 0.00 | 0.05 | 0.10 |
| A2 | | 0.7 REF | |
| b | 0.30 | 0.35 | 0.40 |
| c | 0.10 | 0.15 | 0.25 |
| D | 1.80 | 2.05 | 2.20 |
| E | 1.15 | 1.30 | 1.35 |
| e | 1.20 | 1.30 | 1.40 |
| e1 | | 0.65 BSC | |
| L | 0.20 | 0.35 | 0.56 |
| He | 2.00 | 2.10 | 2.40 |
| ALL Dimension in mm | | | |

## 8.SOLDERING FOOTPRINT




| SC70 | |
|---|---|
| DIM | MIN |
| A | 1.90 |
| B | 0.65 |
| C | 0.65 |
| X | 0.70 |
| Y | 0.90 |