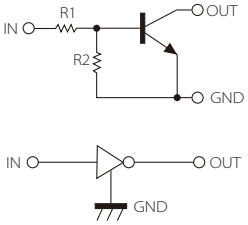
# FEATURES

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors(see equivalent circuit)
- The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input.They also have the advantage of almost completely eliminating parasitic effects
- Only the on/off conditions need to be set for operation, making device design easy


SOT-523


Marking




Schematic Symbol

# APPROVALS

| | |
|---|---|
| **RoHS** | Compliance with 2011/65/EU |
| **HF** | Compliance with IEC61249-2-21:2003 |

# MAXIMUM RATINGS ($T_A$=25°C )

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Supply Voltage | $V_{CC}$ | 50 | V |
| Input Voltage | $V_{IN}$ | -5 to +30 | V |
| Output Current | $I_O$ | 100 | mA |
| Power Dissipation | $P_D$ | 150 | mW |
| Operation Junction and Storage Temperature Range | $T_J$,$T_{stg}$ | -55 to +150 | °C |

# ELECTRICAL CHARACTERISTICS($T_A$=25°C )

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input voltage | $V_{I(off)}$ | $V_{CC}$=5V,$I_O$=100μA | 0.5 | | | V |
| | $V_{I(on)}$ | $V_O$=0.3V ,$I_O$=5mA | | | 1.3 | V |
| Output voltage | $V_{O(on)}$ | $I_O/I_I$=5mA/0.25mA | | 0.1 | 0.3 | V |
| Input current | $I_I$ | $V_I$=5V | | | 1.8 | mA |
| Output current | $I_{O(off)}$ | $V_{CC}$=50V,$V_I$=0 | | | 0.5 | μA |
| DC current gain | $G_I$ | $V_O$=5V,$I_O$=10mA | 80 | | | |
| Input resistance | $R_1$ | | 3.29 | 4.7 | 6.11 | kΩ |
| Resistance ratio | $R_2/R_1$ | | 8 | 10 | 12 | |
| Transition frequency | $f_T$ | $V_O$=10V,$I_O$=5mA,f=100MHz | | 250 | | MHz |

# CHARACTERISTIC CURVES

**Fig.1 ON Characteristics**

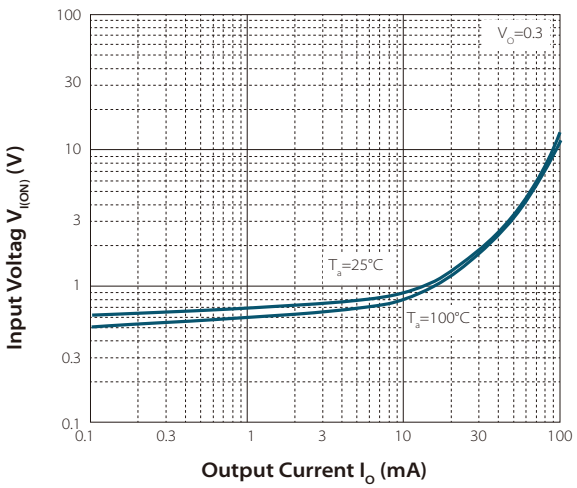



**Fig.2 OFF Characteristics**

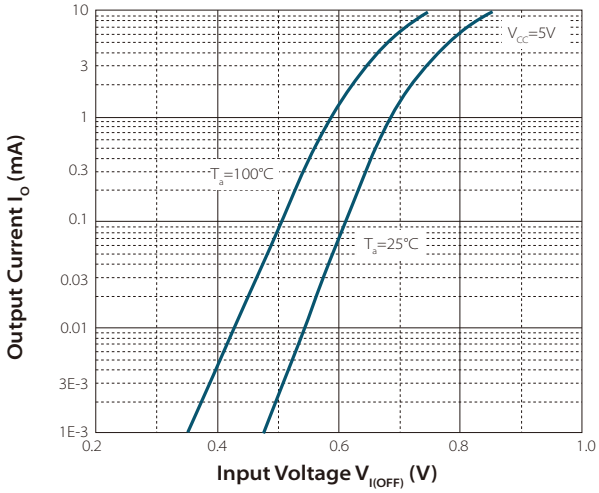


Fig.3 $G_I$ ——— $I_O$

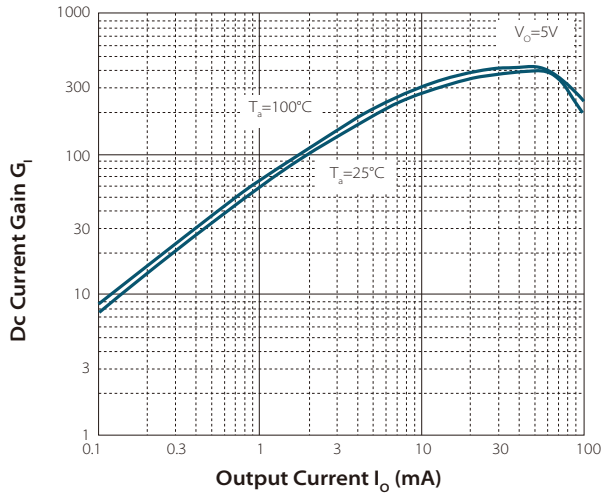



Fig.4 $V_{O(ON)}$ ——— $I_O$

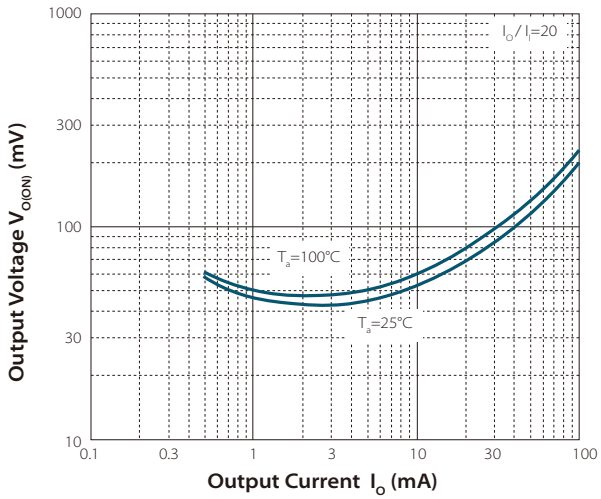



Fig.5 $C_O$ ——— $V_R$

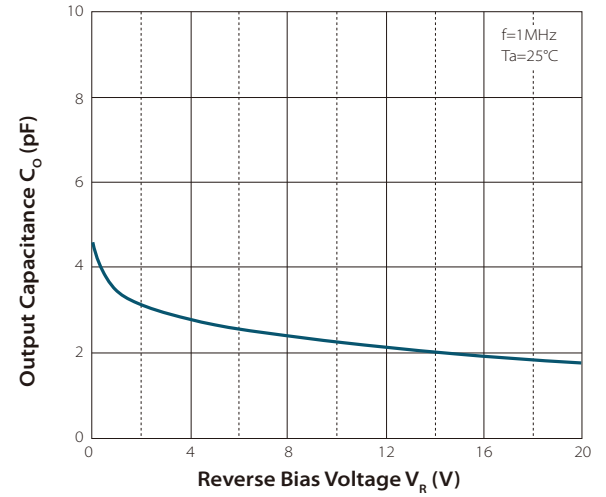
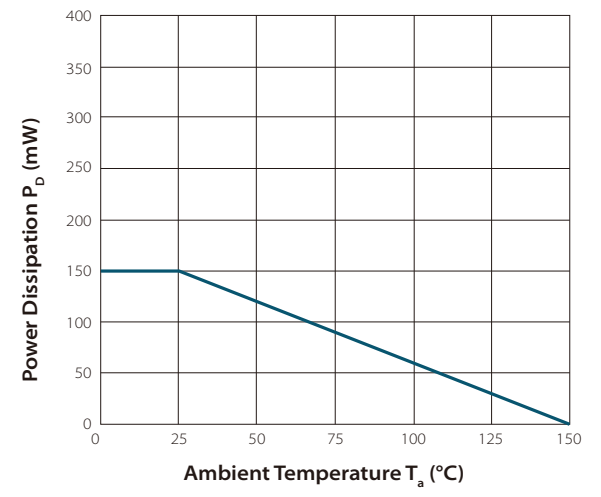
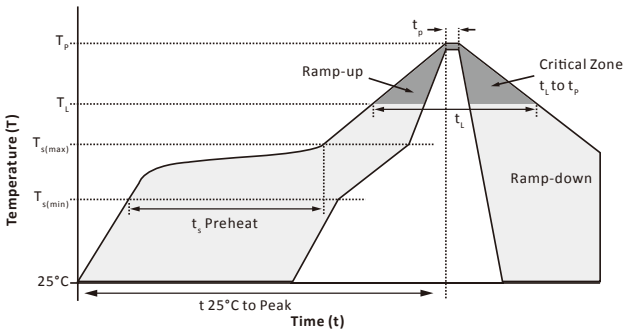



Fig.6 $P_D$ ——— $T_a$

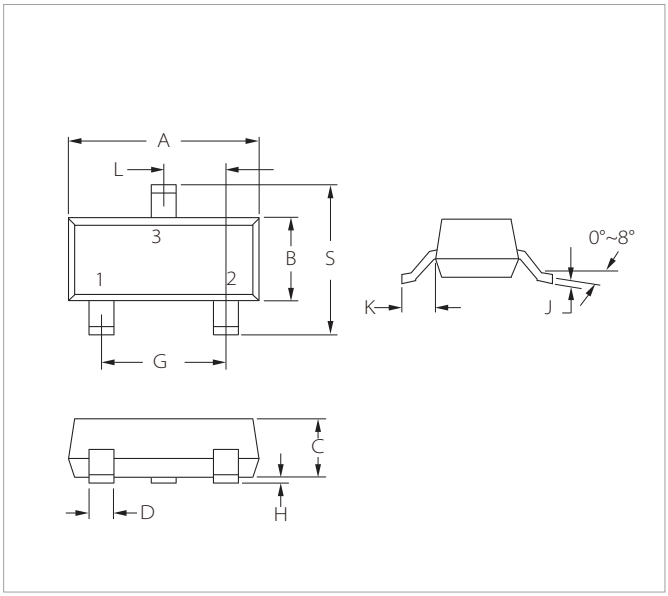


# SOLDERING PARAMETERS

| Reflow Condition | | Lead–free assembly |
|---|---|---|
| Pre Heat | Temperature Max ($T_{s(min)}$) | 150°C |
| | Temperature Max ($T_{s(max)}$) | 200°C |
| | Time (min to max) ($t_s$) | 60 – 180 secs |
| Average ramp up rate (Liquidus Temp ($T_L$) to peak | | 3°C/second max |
| | $T_{S(max)}$ to $T_L$ - Ramp-up Rate | 3°C/second max |
| Reflow | Temperature ($T_L$) (Liquidus) | 217°C |
| | Time (min to max) ($t_L$) | 60 – 150 seconds |
| Peak Temperature ($T_p$) | | 260°C |
| Time within 5°C of actual peak Temperature ($t_p$) | | 20 – 40 seconds |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature ($T_p$) | | 8 minutes max. |
| Do not exceed | | 260°C |

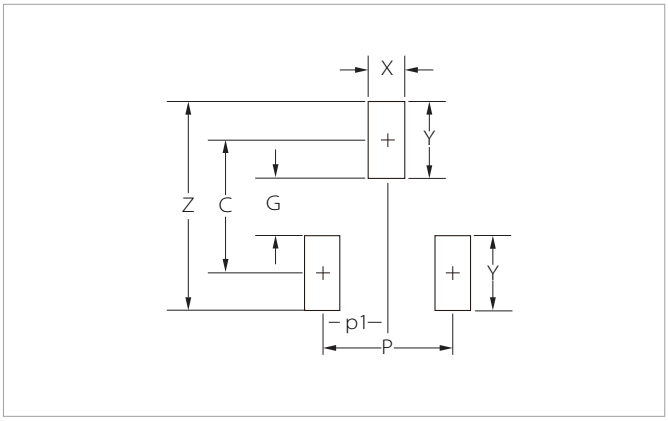



# SOT-523 PACKAGE INFORMATION




| Ref. | Millimeters | | Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 1.50 | 1.70 | 0.059 | 0.067 |
| B | 0.75 | 0.85 | 0.029 | 0.033 |
| C | 0.60 | 0.80 | 0.023 | 0.031 |
| D | 0.15 | 0.30 | 0.005 | 0.012 |
| G | 1.00BSC | | 0.039BSC | |
| H | 0.00 | 0.10 | 0.000 | 0.004 |
| J | 0.10 | 0.20 | 0.004 | 0.008 |
| K | (0.22) | | (0.009) | |
| L | 0.50BSC | | 0.020BSC | |
| S | 1.45 | 1.75 | 0.057 | 0.069 |

# RECOMMENDED PAD LAYOUT DIMENSIONS




| Ref. | Millimeters | Inches |
|---|---|---|
| C | (1.40) | (0.055) |
| P | 1.00 | 0.039 |
| p1 | 0.50 | 0.020 |
| G | 0.60 | 0.024 |
| X | 0.40 | 0.016 |
| Y | 0.80 | 0.031 |
| Z | 2.20 | 0.087 |

# ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel Size |
|---|---|---|---|
| DTC143ZE | SOT-523 | 3000PCS | 7″ |

To find your local partner within Semiwell's website : www.semiwell.com.cn