

TOSHIBA

TPCF8103

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE(U - MOS)

TPCF8103

Tentative

NOTE BOOK PC APPLICATIONS
PORTABLE EQUIPMENTS APPLICATIONS

UNIT:mm

- Low Drain - Source ON Resistance : $R_{DS(ON)} = 72m$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 6$ S(Typ.)
- Low Leakage Current : $I_{DSS} = -10\mu A$ (Max.) ($V_{DS} = -20V$)
- Enhancement - Mode : $V_{th} = -0.5 \sim -1.2V$ ($V_{DS} = -10V, I_D = -200\mu A$)

MAXIMUM RATINGS (Ta = 25)

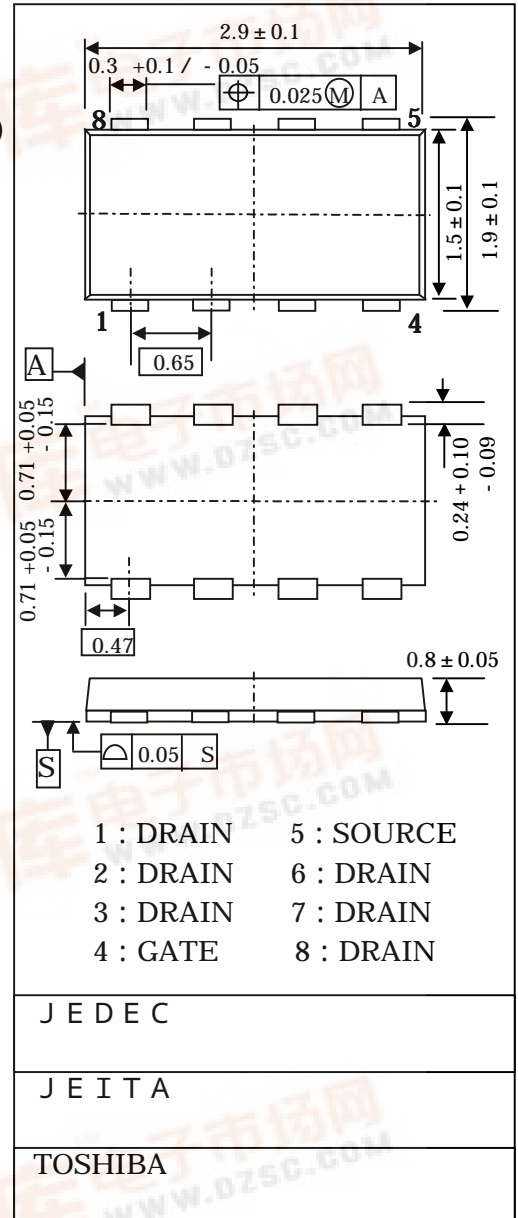
| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|--|---------------|-----------|------------|------|
| Drain - Source Voltage | | V_{DSS} | -20 | V |
| Drain - Gate Voltage ($R_{GS} = 20k$) | | V_{DGR} | -20 | V |
| Gate - Source Voltage | | V_{GSS} | ± 8 | V |
| Drain Current | DC (Note1) | I_D | -2.7 | A |
| | Pulse (Note1) | I_{DP} | -10.8 | A |
| Drain Power Dissipation (t=5s) (Note2a) | | P_D | 2.5 | W |
| Drain Power Dissipation (t=5s) (Note2b) | | P_D | 0.7 | W |
| Single Pulse Avalanche Energy (Note3) | | E_{AS} | 1.2 | mJ |
| Avalanche Current | | I_{AR} | -1.35 | A |
| Repetitive Avalanche Energy (Note4) | | E_{AR} | 0.25 | mJ |
| Channel Temperature | | T_{ch} | 150 | |
| Storage Temperature Range | | T_{stg} | - 55 ~ 150 | |

THERMAL CHARACTERISTICS

| CHARACTERISTICS | SYMBOL | MAX. | UNIT |
|--|----------------|-------|------|
| Thermal Resistance, Channel to Ambient (t=5s) (Note2a) | $R_{th(ch-a)}$ | 50.0 | / W |
| Thermal Resistance, Channel to Ambient (t=5s) (Note2b) | $R_{th(ch-a)}$ | 178.6 | / W |

Note1, Note2, Note3, Note4, Note5 Please see next page.

THIS TRANSISTOR IS AN ELECTROSTATIC SENSITIVE DEVICE.
PLEASE HANDLE WITH CAUTION.



Tentative

ELECTRICAL CHARACTERISTICS (Ta = 25)

| CHARACTERISTICS | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT | |
|---|----------------|--|------|------|----------|---------|----|
| Gate Leakage Current | I_{GSS} | $V_{GS} = \pm 8V, V_{DS} = 0V$ | - | - | ± 10 | μA | |
| Drain Cut-off Current | I_{DSS} | $V_{DS} = -20V, V_{GS} = 0V$ | - | - | -10 | μA | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D = -10mA, V_{GS} = 0V$ | -20 | - | - | V | |
| | $V_{(BR)DSSX}$ | $I_D = -10mA, V_{GS} = 8V$ | -8 | - | - | V | |
| Gate Threshold Voltage | V_{th} | $V_{DS} = -10V, I_D = -200\mu A$ | -0.5 | - | -1.2 | V | |
| Drain-Source ON Resistance | $R_{DS(ON)}$ | $V_{GS} = -1.8V, I_D = -1.4A$ | - | 215 | 300 | m | |
| | | $V_{GS} = -2.5V, I_D = -2.8A$ | - | 110 | 160 | | |
| | | $V_{GS} = -4.5V, I_D = -2.8A$ | - | 72 | 110 | | |
| Forward Transfer Admittance | $ Y_{fs} $ | $V_{DS} = -10V, I_D = -2.8A$ | 3.0 | 6.0 | - | S | |
| Input Capacitance | C_{iss} | $V_{DS} = -10V, V_{GS} = 0V$ $f = 1MHz$ | - | 470 | - | pF | |
| Reverse Transfer Capacitance | C_{rss} | | - | 70 | - | | |
| Output Capacitance | C_{oss} | | - | 80 | - | | |
| Switching Time | Rise Time | t_r | | - | 5 | - | ns |
| | Turn-on Time | t_{on} | | - | 9 | - | |
| | Fall Time | t_f | | - | 8 | - | |
| | Turn-off Time | t_{off} | | - | 26 | - | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | Q_g | $V_{DD} = -16V, V_{GS} = -5V$ $I_D = -2.7A$ | - | 6 | - | nC | |
| Gate-Source Charge | Q_{gs} | | - | 4.5 | - | | |
| Gate-Drain("Miller")Charge | Q_{gd} | | - | 1.5 | - | | |

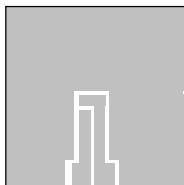
SOURCE - DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25)

| CHARACTERISTICS | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------|-----------|-------------------------------|------|------|-------|------|
| Pulse Drain Reverse Current (Note1) | I_{DRP} | - | - | - | -10.8 | A |
| Diode Forward Voltage | V_{DSF} | $I_{DR} = -2.7A, V_{GS} = 0V$ | - | - | 1.2 | V |

Note1 Please use devices on condition that the channel temperature is below 150 .

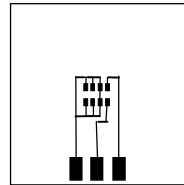
Note2:

- (a) Device mounted on glass-epoxy board (a) (b) Device mounted on glass-epoxy board (b)



(a)

FR-4
25.4 × 25.4 × 0.8
(Unit in mm)



(b)

FR-4
25.4 × 25.4 × 0.8
(Unit in mm)

Note3: $V_{DD} = -16V, T_{ch} = 25$ (initial), $L = 0.5mH, R_G = 25$, $I_{AR} = -1.35A$

Note4: Repetitive rating ; Pulse Width Limited by Max. Channel Temperature.

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