

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 :  $V_{th} = -0.5 \sim -1.2V$  ( $V_{DS} = -10V, I_D = -200\mu A$ )

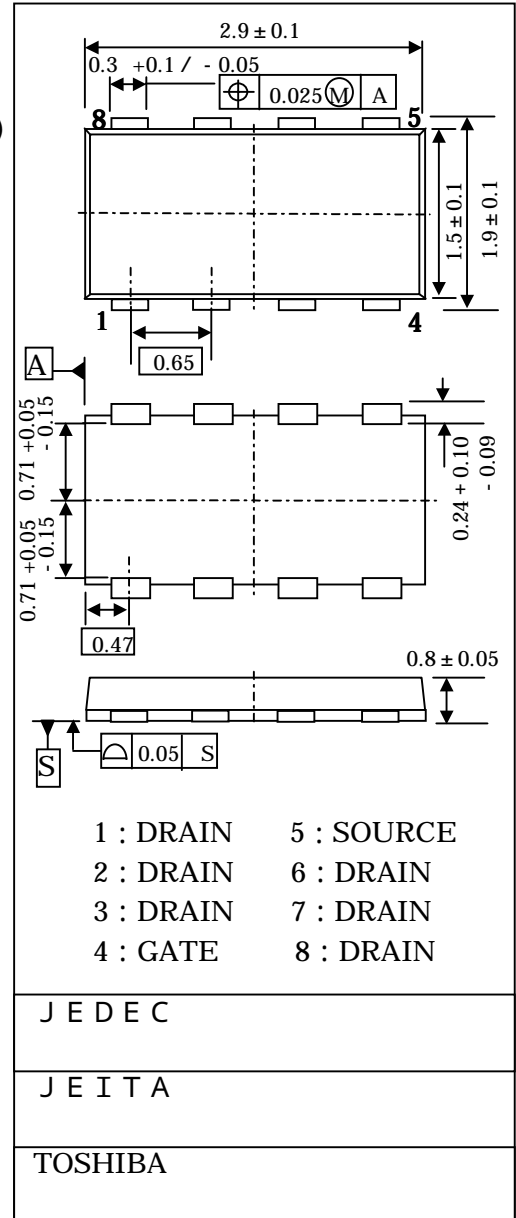
MAXIMUM RATINGS ( $T_a = 25$  )

CHARACTERISTIC	SYMBOL	RATING	UNIT	
Drain - Source Voltage	$V_{DSS}$	-20	V	
Drain - Gate Voltage ( $R_{GS} = 20k$ )	$V_{DGR}$	-20	V	
Gate - Source Voltage	$V_{GSS}$	$\pm 8$	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 °C)

CHARACTERISTICS		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GSS}$	$V_{GS} = \pm 8V, V_{DS} = 0V$	-	-	$\pm 10$	$\mu A$
Drain Cut-off Current		$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$	-	-	-10	$\mu A$
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = -10mA, V_{GS} = 0V$	-20	-	-	V
		$V_{(BR)DSX}$	$I_D = -10mA, V_{GS} = 8V$	-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	-	

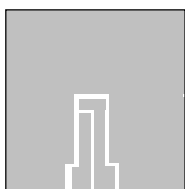
## SOURCE - DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25 °C)

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

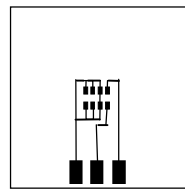
Note1 Please use devices on condition that the channel temperature is below 150 °C.

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),  $L = 0.5mH, R_G = 25$   $\Omega, I_{AR} = -1.35A$ 

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

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