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

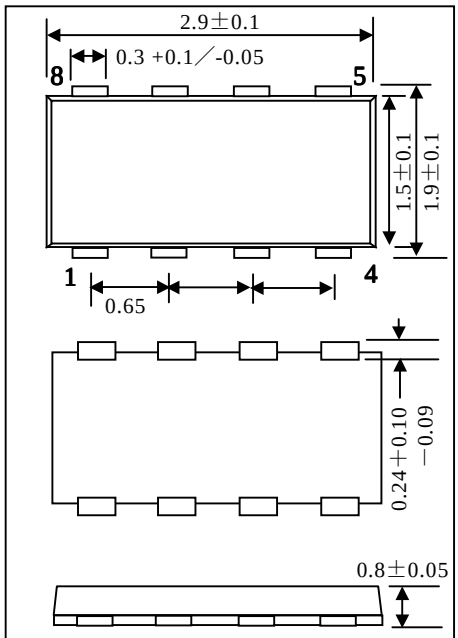
TPCF8301

Tentative

NOTE BOOK PC APPLICATIONS
PORTABLE EQUIPMENTS APPLICATIONS

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

UNIT:mm



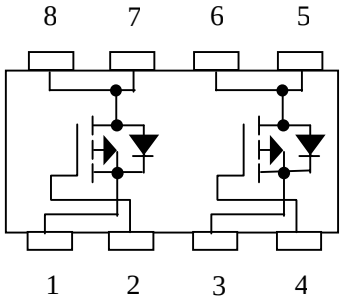
1:SOURCE1 5:DRAIN 2
2:GATE 1 6:DRAIN2
3:SOURCE2 7:DRAIN1
4:GATE2 8:DRAIN1

JEDEC	—
JEITA	—
TOSHIBA	—

Maximum Ratings (T_a=25°C)

Characteristics		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	-20	V
Drain-gate voltage(R_{GS}=20kΩ)		V_{DGR}	-20	V
Gate-source voltage		V_{GSS}	±8	V
Drain current	DC (Note 1)	I_D	-2.7	A
	Pulse (Note 1)	I_{DR}	-10.8	
Drain power dissipation (t=5s)(Note 2a)	Single-device operation (Note 3a)	$P_{D(1)}$	1.35	W
	Single-device value at dual operation (Note 3b)	$P_{D(2)}$	1.12	
Drain power dissipation (t=5s)(Note 2b)	Single-device operation (Note 3a)	$P_{D(1)}$	0.53	
	Single-device value at dual operation (Note 3b)	$P_{D(2)}$	0.33	
Single pulse avalanche energy (Note 4)		E_{AS}	1.2	mJ
Avalanche current		I_{AR}	-1.35	A
Repetitive avalanche energy Single-device value at dual operation (Note 2a,3b,5)		E_{AR}	0.11	mJ
Channel temperature		T_{ch}	150	°C
Storage temperature range		T_{stg}	-55～150	°C

Circuit Configuration



THERMAL CHARACTERISTICS

Characteristics		Symbol	Max	Unit
Thermal resistance, channel to ambient (t=5s) (Note 2a)	Single-device operation (Note 3a)	$R_{th(ch-a)(1)}$	92.6	°C/W
	Single-device value at dual operation (Note 3b)	$R_{th(ch-a)(2)}$	111.6	
Thermal resistance, channel to ambient (t=5s) (Note 2b)	Single-device operation (Note 3a)	$R_{th(ch-a)(1)}$	235.8	°C/W
	Single-device value at dual operation (Note 3b)	$R_{th(ch-a)(2)}$	378.8	

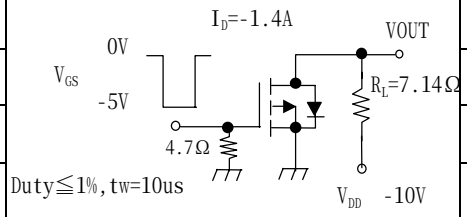
Note1, Note2, Note3, Note4, Note5 Please see next page.

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}	$V_{GS}=\pm8V$, $V_{DS}=0V$	—	—	±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
		$V_{(BR)DSX}$	$I_D=-10mA$, $V_{GS}=8V$	-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	mΩ
			$V_{GS}=-2.5V$, $I_D=-2.8A$	—	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	—	

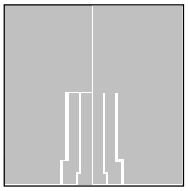
SOURCE - DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta=25°C)

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:

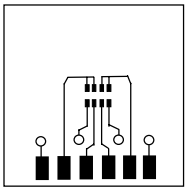
(a) Device mounted on glass-epoxy board (a)



FR-4
25.4×25.4×0.8
(Unit in mm)

(a)

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



FR-4
25.4×25.4×0.8
(Unit in mm)

(b)

Note3:

(a) The power dissipation and thermal resistance values are shown for a single device (During single-device operation, power is only applied to one device.).

(b) The power dissipation and thermal resistance values are shown for a single device (During dual operation, power is evenly applied to both devices.).

Note4: V_{DD}=-16V, Tch=25°C(initial), L=0.5mH, R_G=25Ω, I_{AR}=-1.35A

Note5: Repetitive rating ; Pulse Width Limited by Max. Channel Temperature.

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