

TOSHIBA

TPCF8301

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

TPCF8301

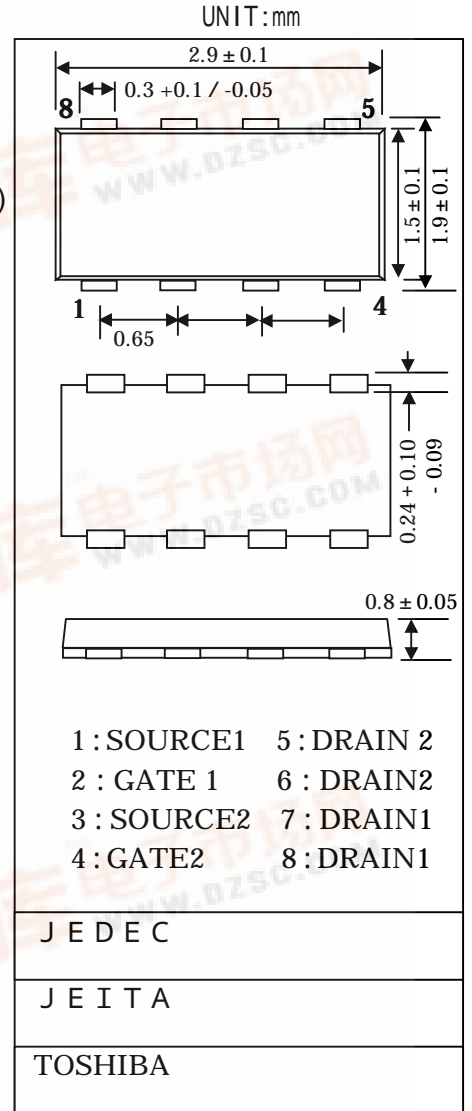
Tentative

NOTE BOOK PC APPLICATIONS
PORTABLE EQUIPMENTS APPLICATIONS

- 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 ($T_a=25$)

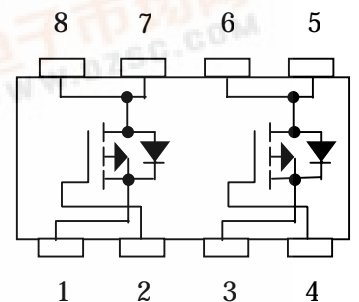
Characteristics		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	-20	V
Drain-gate voltage($R_{GS}=20k$)		V_{DGR}	-20	V
Gate-source voltage		V_{GSS}	± 8	V
Drain current	DC (Note 1)	I_D	-2.7	A
	Pulse (Note 1)	I_{DR}	-10.8	
Drain power dissipation ($t=5s$)(Note 2a)	Single-device operation (Note 3a)	$P_{D(1)}$	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	
Storage temperature range		T_{stg}	-55 ~ 150	



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	/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	/W
	Single-device value at dual operation (Note 3b)	$R_{th(ch-a)(2)}$	378.8	

Circuit Configuration



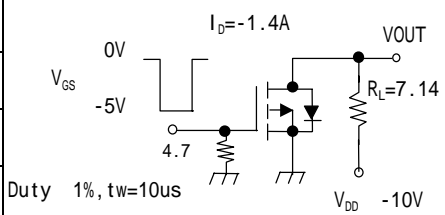
Note1, Note2, Note3, Note4, Note5 Please see next page.

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}	$V_{GS} = \pm 8V, V_{DS} = 0V$	-	-	± 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	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	-		

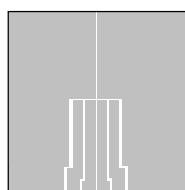
SOURCE - DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25 °C)

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:

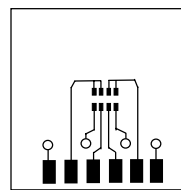
(a) Device mounted on glass-epoxy board (a)



(a)

FR-4
25.4 × 25.4 × 0.8
(Unit in mm)

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



(b)

FR-4
25.4 × 25.4 × 0.8
(Unit in mm)

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

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

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