

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE

# 2SK1310A

RF POWER MOS FET for VHF TV BROADCAST TRANSMITTER

- Output Power :  $P_o \geq 190$  W (Min.)
- Drain Efficiency :  $\eta_D = 65\%$  (Typ.)
- Frequency :  $f = 230$  MHz
- Push-Pull Structure Package

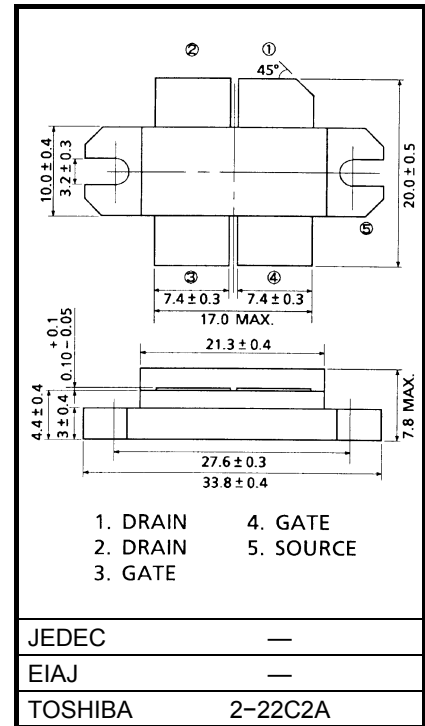
Unit in mm

## ABSOLUTE MAXIMUM RATINGS (Tc = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSS}$	100	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current	$I_D$	12	A
Reverse Drain Current	$I_{DR}$	12	A
Drain Power Dissipation	$P_D$	250	W
Channel Temperature	$T_{ch}$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).



Weight: 17.5 g

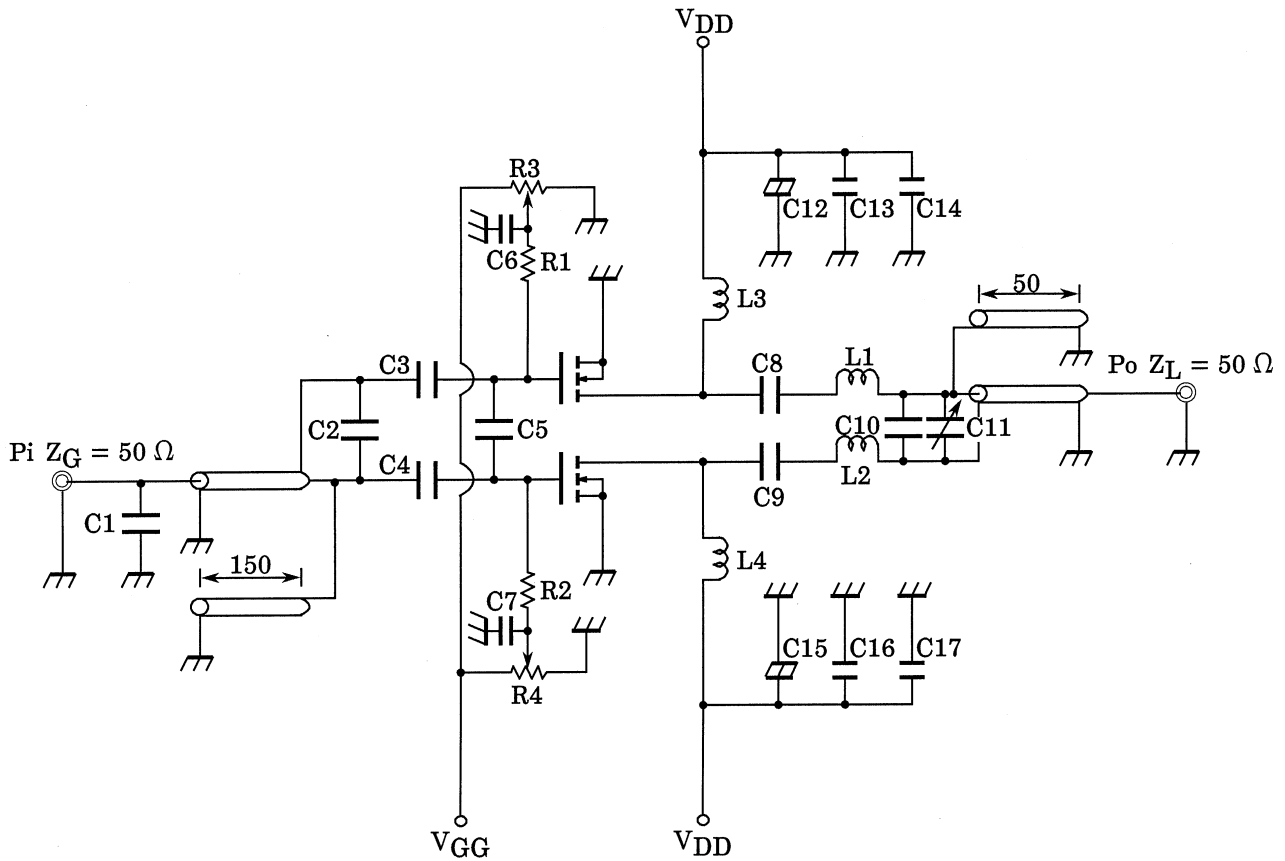
## ELECTRICAL CHARACTERISTICS (T<sub>c</sub> = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Power	P <sub>o</sub>	V <sub>DD</sub> = 50 V, I <sub>idle</sub> = 0.2 A × 2 P <sub>i</sub> = 10 W, f = 230 MHz *	190	220	—	W
Drain Efficiency	η <sub>D</sub>		—	65	—	%
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0	100	—	—	V
Drain Cut-off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 80 V, V <sub>GS</sub> = 0	—	—	1.0	mA
Gate Threshold Voltage	V <sub>th</sub>	I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V	0.5	—	3.0	V
Drain-Source ON Resistance	R <sub>DS(on)</sub>	I <sub>D</sub> = 4 A, V <sub>GS</sub> = 10 V **	—	0.9	1.5	Ω
Drain-Source ON Voltage	V <sub>DS(on)</sub>	I <sub>D</sub> = 4 A, V <sub>GS</sub> = 10 V **	—	3.6	6.0	V
Forward Transfer Admittance	Y <sub>fs</sub>	I <sub>D</sub> = 3 A, V <sub>DS</sub> = 20 V **	0.9	1.3	—	S
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 0, f = 1 MHz	—	100	—	pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 0, f = 1 MHz	—	40	—	pF
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 0, f = 1 MHz	—	1	—	pF

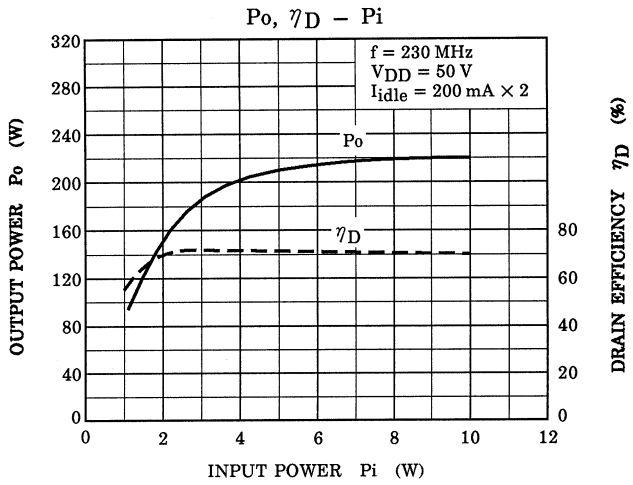
\*: Push-Pull Operation    \*\*: Pulse Test

This transistor is the electrostatic sensitive device. Please handle with caution.

**RF OUTPUT POWER TEST FIXTURE**



- |                            |                        |                           |
|----------------------------|------------------------|---------------------------|
| C1 :                       | 1pF                    | MICA CAPACITOR            |
| C2 :                       | 33 pF × 3 (PARALLEL)   | MICA CAPACITOR            |
| C3, C4, C8, C9, C13, C16 : | 1000 pF                | MICA CAPACITOR            |
| C5 :                       | 33 pF                  | MICA CAPACITOR            |
| C6, C7 :                   | 0.01 μF × 2 (PARALLEL) | CERAMIC CAPACITOR         |
| C10 :                      | 14 pF                  | MICA CAPACITOR            |
| C11 :                      | ~20 pF                 | AIR TRIMMER CAPACITOR     |
| C12, C15 :                 | 100 μF, 100 V          | ELECTROLYTIC CAPACITOR    |
| C14, C17 :                 | 4700 pF                | CERAMIC CAPACITOR         |
| L1, L2 :                   | 0.5T, 5ID φ1.0         | SILVER PLATED COPPER WIRE |
| L3, L4 :                   | 3.0T, 5ID φ1.0         | SILVER PLATED COPPER WIRE |
| R1, R2 :                   | 220 Ω × 2 (PARALLEL)   |                           |
| R3, R4 :                   | 1 kΩ                   | VARIABLE RESISTOR         |



**CAUTION**

These are only typical curves and devices are not necessarily guaranteed at these curves.

**RESTRICTIONS ON PRODUCT USE**

20070701-EN GENERAL

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