

# 2SK3756

## VHF- and UHF-band Amplifier Applications

(Note)The TOSHIBA products listed in this document are intended for high frequency Power Amplifier of telecommunications equipment. These TOSHIBA products are neither intended nor warranted for any other use. Do not use these TOSHIBA products listed in this document except for high frequency Power Amplifier of telecommunications equipment.

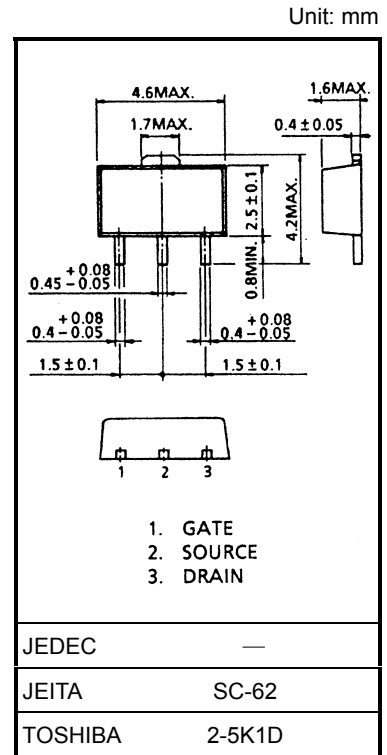
- Output power:  $P_O = 32\text{dBmW}$  (typ)
- Gain:  $G_P = 12\text{dB}$  (typ)
- Drain efficiency:  $\eta_D = 60\%$  (typ)

### Maximum Ratings (Ta = 25°C)

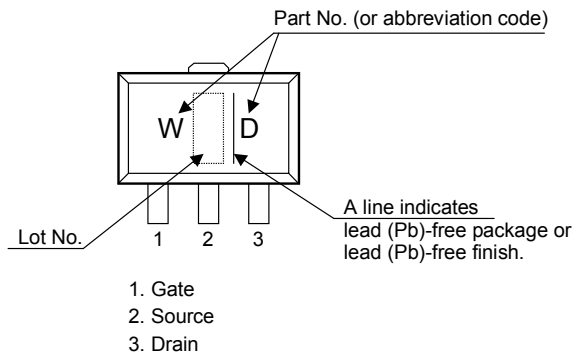
| Characteristics           | Symbol             | Rating  | Unit |
|---------------------------|--------------------|---------|------|
| Drain-source voltage      | $V_{DSS}$          | 7.5     | V    |
| Gain-source voltage       | $V_{GSS}$ (Note 1) | 3       | V    |
| Drain current             | $I_D$              | 1       | A    |
| Power dissipation         | $P_D$ (Note 2)     | 3       | W    |
| Channel temperature       | $T_{ch}$           | 150     | °C   |
| Storage temperature range | $T_{stg}$          | -45~150 | °C   |

Note 1: Recommended Operation Condition: 0~3V

Note 2:  $T_c = 25^\circ\text{C}$  (When mounted on a 0.8 mm glass epoxy PCB)



### Marking



**Caution:** This device is sensitive to electrostatic discharge.

Please make enough tool and equipment earthed when you handle.

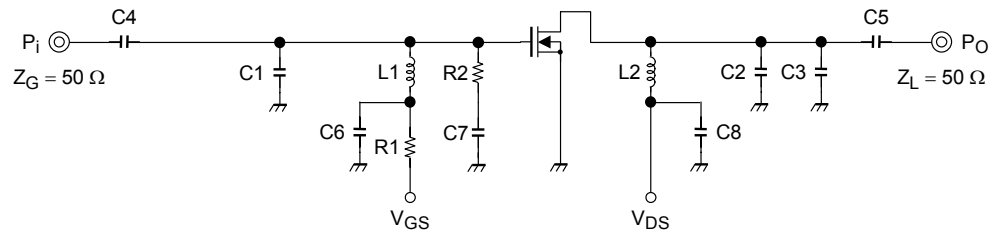
## Electrical Characteristics (Ta = 25°C)

| Characteristics             | Symbol    | Test Condition   | Min            | Typ. | Max  | Unit          |
|-----------------------------|-----------|--|----------------|------|------|---------------|
| Output power                | $P_O$     | $V_{DS} = 4.5 \text{ V}$ ,<br>$I_{idle} = 200 \text{ mA}$ ( $V_{GS} = \text{adjust}$ ),<br>$f = 470 \text{ MHz}$ , $P_i = 20\text{dBmW}$ ,                       | 31             | 32   | —    | dBmW          |
| Drain efficiency            | $\eta_D$  |  | 50             | 60   | —    | %             |
| Power gain                  | $G_P$     |  | —              | 12   | —    | dB            |
| Threshold voltage           | $V_{th}$  | $V_{DS} = 4.5 \text{ V}$ , $I_D = 0.5 \text{ mA}$  | —              | 0.95 | 1.45 | V             |
| Drain cut-off current       | $I_{DSS}$ | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0 \text{ V}$   | —              | —    | 10   | $\mu\text{A}$ |
| Gate-source leakage current | $I_{GSS}$ | $V_{GS} = 3 \text{ V}$ , $V_{DS} = 0 \text{ V}$  | —              | —    | 5    | $\mu\text{A}$ |
| Load Mismatch (Note 3)      | —         | $V_{DS} = 4.5 \text{ V}$ , $f = 470 \text{ MHz}$ ,<br>$P_i = 20\text{dBmW}$ ,<br>$P_o = 31\text{dBmW}$ ( $V_{GS} = \text{adjust}$ ),<br>VSWR LOAD 10:1 all phase | No Degradation |      |      | —             |

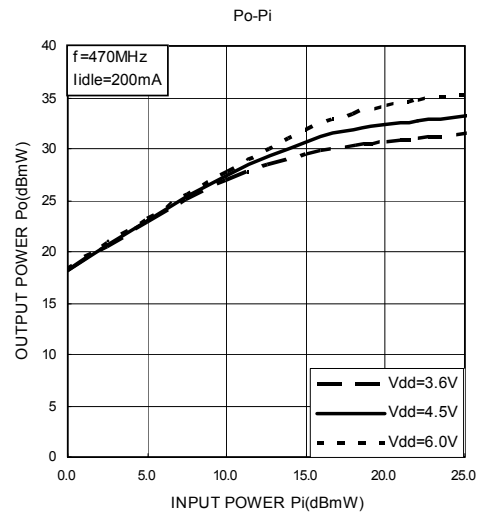
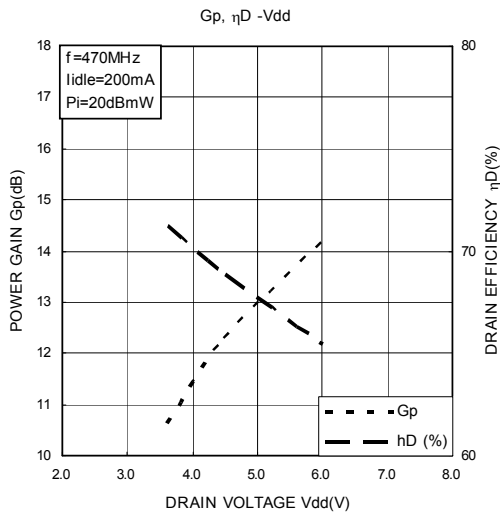
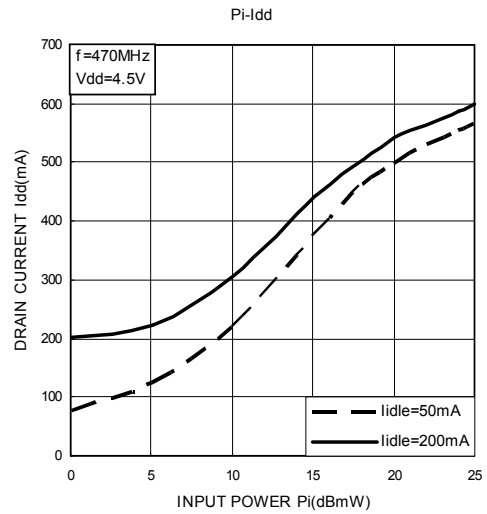
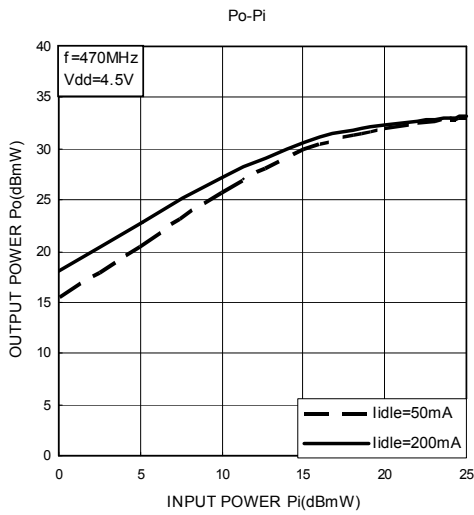
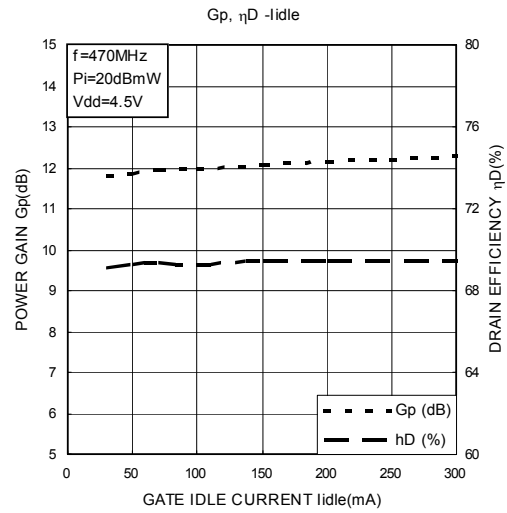
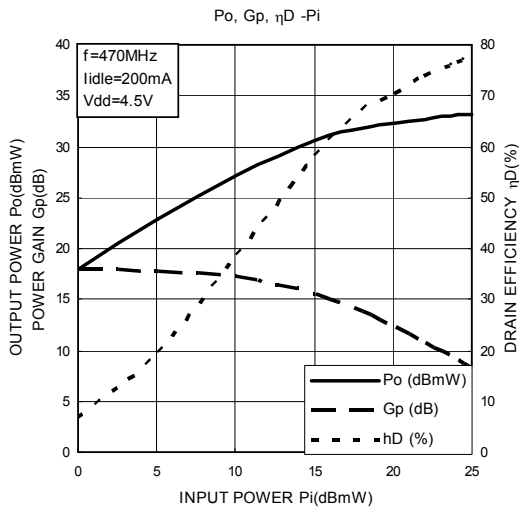
Note 3: These characteristic values are measured using measurement tools specified by Toshiba.

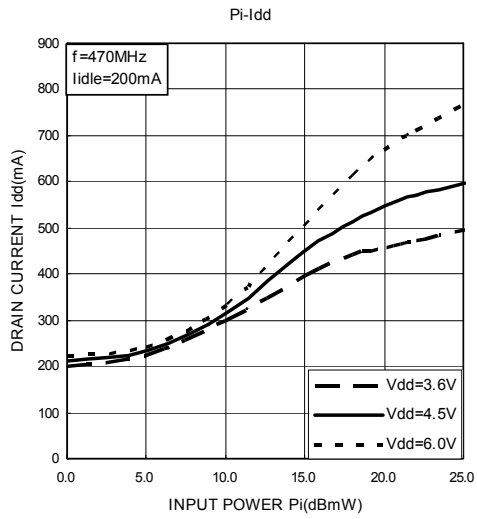
### Output Power Test Fixture

(Test Condition:  $f = 470 \text{ MHz}$ ,  $V_{DS} = 4.5 \text{ V}$ ,  $I_{idle} = 200 \text{ mA}$ ,  $P_i = 20 \text{ dBmW}$ )



- |              |  |                    |
|--------------|--|--------------------|
| C1: 20 pF    | L1: $\phi 0.6 \text{ mm}$ enamel wire, 5.5ID, 5T | R1: 6.8 k $\Omega$ |
| C2: 17 pF    | L2: $\phi 0.6 \text{ mm}$ enamel wire, 5.5ID, 7T | R2: 56 $\Omega$    |
| C3: 1 pF     |  |                    |
| C4: 2200 pF  | Line: 2mm  |                    |
| C5: 2200 pF  |  |                    |
| C6: 10000 pF |  |                    |
| C7: 2200 pF  |  |                    |
| C8: 10000 pF |  |                    |





Note 4: These are only typical curves and devices are not necessarily guaranteed at these curves.

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