

TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

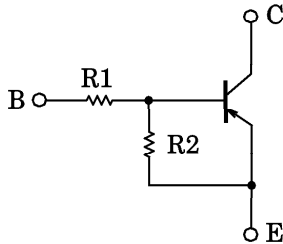
RN2961, RN2962, RN2963, RN2964, RN2965, RN2966

SWITCHING, INVERTER CIRCUIT, INTERFACE CIRCUIT
AND DRIVER CIRCUIT APPLICATIONS.

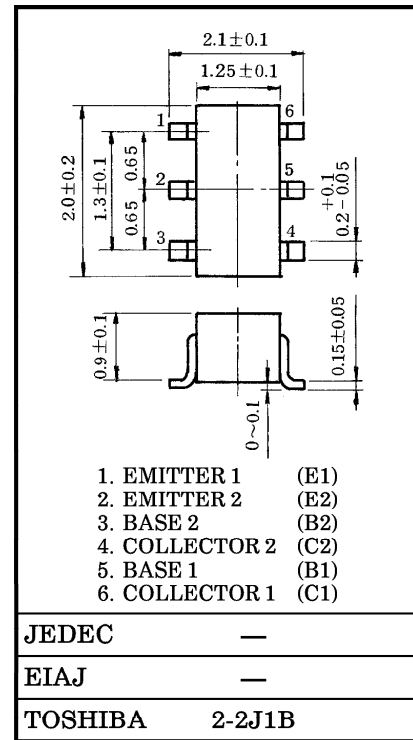
Unit in mm

- Including Two Devices in US6 (Ultra Super Mini Type with 6 leads)
- With Built-in Bias Resistors
- Simplify Circuit Design
- Reduce a Quantity of Parts and Manufacturing Process
- Complementary to RN1961~RN1966

EQUIVALENT CIRCUIT AND BIAS RESISTOR VALUES



| TYPE No. | R1 (kΩ) | R2 (kΩ) |
|----------|---------|---------|
| RN2961 | 4.7 | 4.7 |
| RN2962 | 10 | 10 |
| RN2963 | 22 | 22 |
| RN2964 | 47 | 47 |
| RN2965 | 2.2 | 47 |
| RN2966 | 4.7 | 47 |



1. EMITTER 1 (E1)
2. EMITTER 2 (E2)
3. BASE 2 (B2)
4. COLLECTOR 2 (C2)
5. BASE 1 (B1)
6. COLLECTOR 1 (C1)

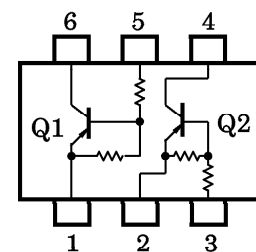
Weight : 6.8mg

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------------|--------------|--------|------------|
| Collector-Base Voltage | RN2961~2966 | VCBO | -50 V |
| Collector-Emitter Voltage | | VCEO | -50 V |
| Emitter-Base Voltage | RN2961~2964 | VEBO | -10 V |
| | RN2965, 2966 | | -5 V |
| Collector Current | RN2961~2966 | IC | -100 mA |
| Collector Power Dissipation | | PC * | 200 mW |
| Junction Temperature | | Tj | 150 C° |
| Storage Temperature Range | | Tstg | -55~150 C° |

* : Total Rating

EQUIVALENT CIRCUIT (TOP VIEW)



961001EAA2

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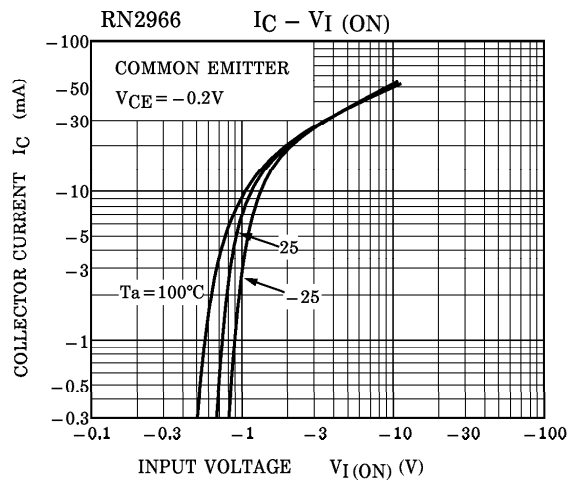
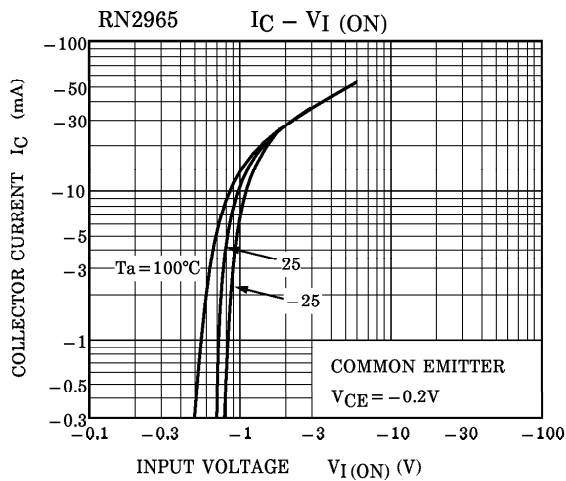
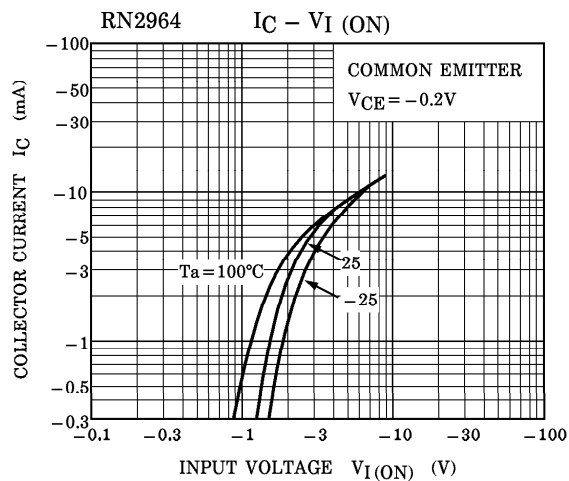
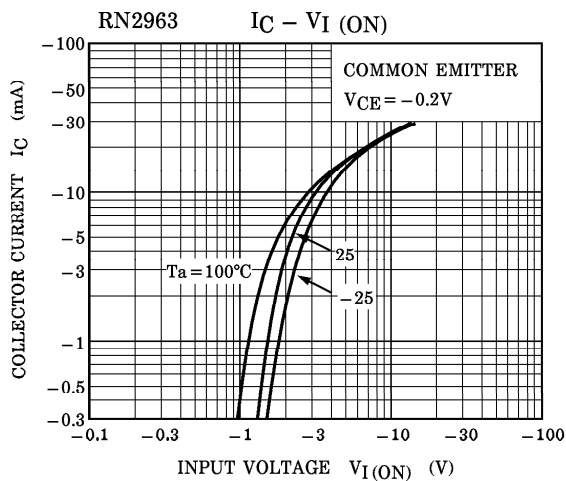
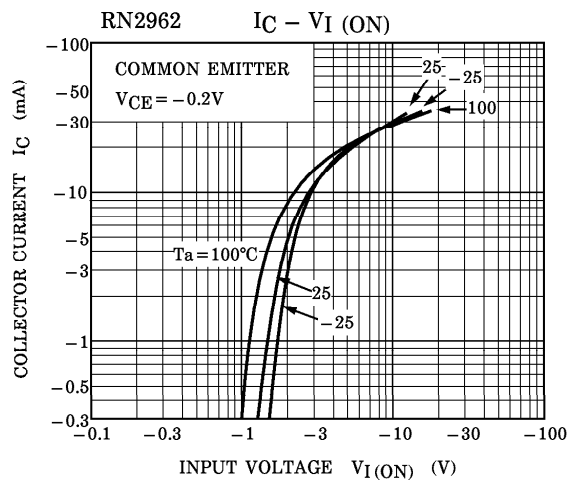
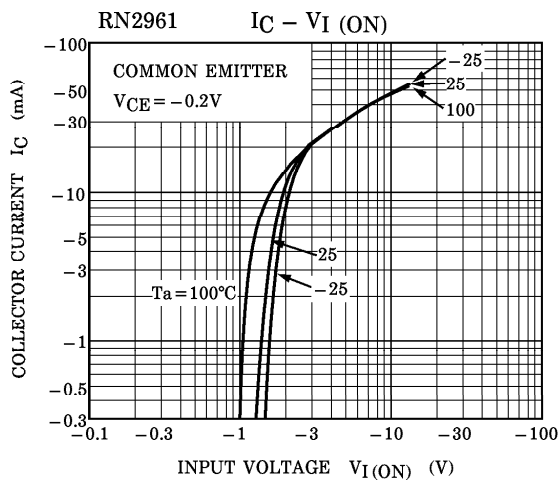
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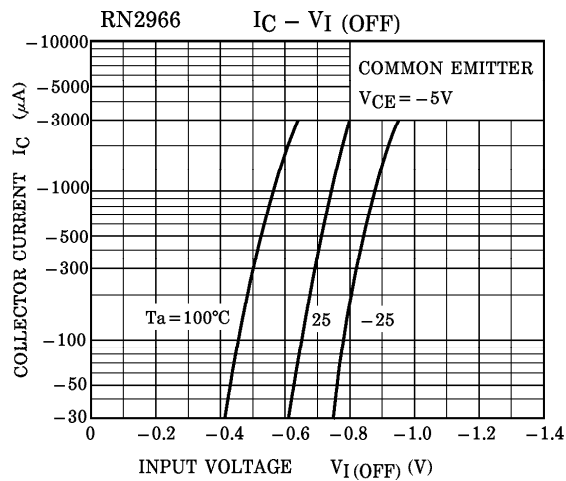
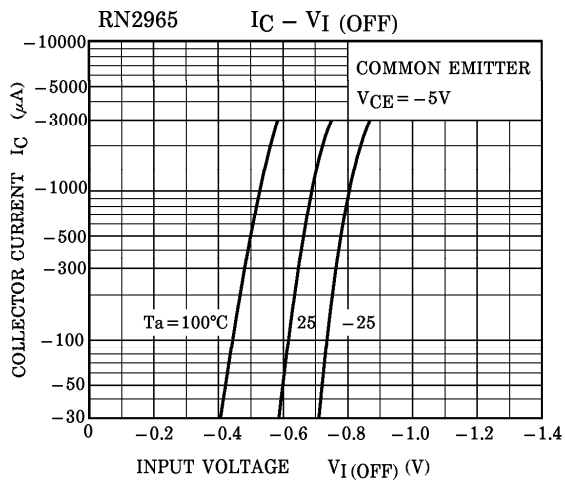
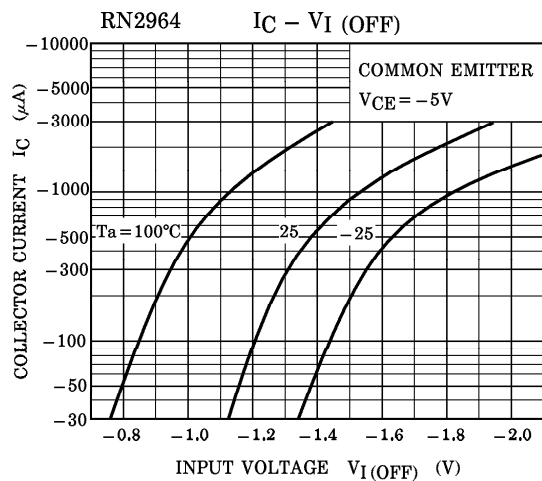
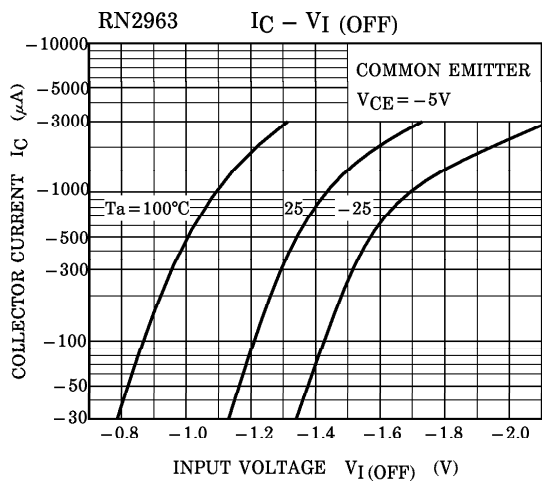
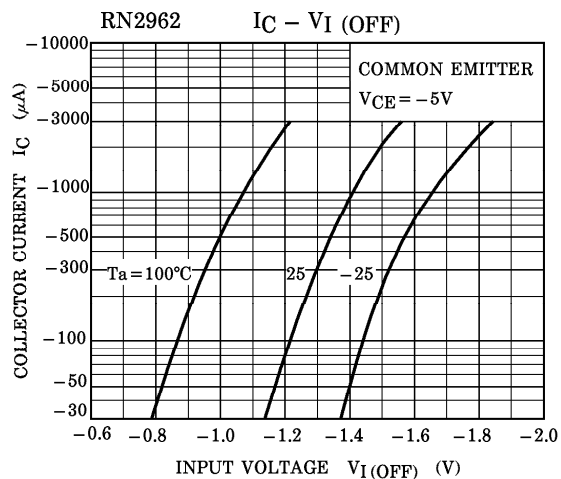
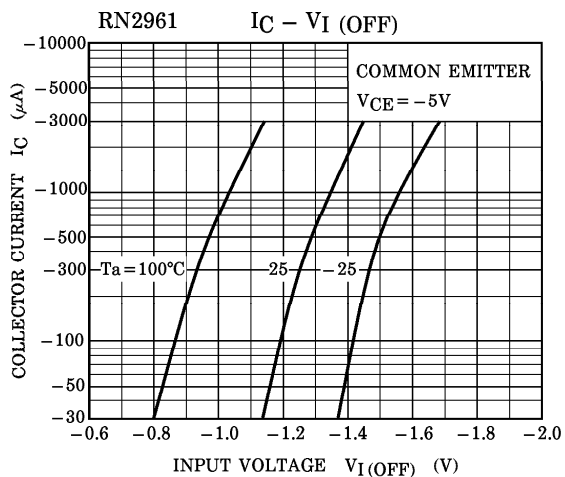
ELECTRICAL CHARACTERISTICS (Ta = 25°C) (Q1, Q2 COMMON)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--------------------------------------|--------------|---------------|------------------------------------|--------|--------|--------|------------|
| Collector Cut-off Current | RN2961~2966 | I_{CBO} | $V_{CB} = -50V, I_E = 0$ | — | — | -100 | nA |
| | | I_{CEO} | $V_{CE} = -50V, I_B = 0$ | — | — | -500 | |
| Emitter Cut-off Current | RN2961 | I_{EBO} | $V_{EB} = -10V, I_C = 0$ | -0.82 | — | -1.52 | mA |
| | RN2962 | | | -0.38 | — | -0.71 | |
| | RN2963 | | | -0.17 | — | -0.33 | |
| | RN2964 | | | -0.082 | — | -0.15 | |
| | RN2965 | | $V_{EB} = -5V, I_C = 0$ | -0.078 | — | -0.145 | |
| | RN2966 | | | -0.074 | — | -0.138 | |
| DC Current Gain | RN2961 | h_{FE} | $V_{CE} = -5V, I_C = -10mA$ | 30 | — | — | |
| | RN2962 | | | 50 | — | — | |
| | RN2963 | | | 70 | — | — | |
| | RN2964 | | | 80 | — | — | |
| | RN2965 | | | 80 | — | — | |
| | RN2966 | | | 80 | — | — | |
| Collector-Emitter Saturation Voltage | RN2961~2966 | $V_{CE(sat)}$ | $I_C = -5mA, I_B = -0.25mA$ | — | -0.1 | -0.3 | V |
| Input Voltage (ON) | RN2961 | $V_{I(ON)}$ | $V_{CE} = -0.2V, I_C = -5mA$ | -1.1 | — | -2.0 | V |
| | RN2962 | | | -1.2 | — | -2.4 | |
| | RN2963 | | | -1.3 | — | -3.0 | |
| | RN2964 | | | -1.5 | — | -5.0 | |
| | RN2965 | | | -0.6 | — | -1.1 | |
| | RN2966 | | | -0.7 | — | -1.3 | |
| Input Voltage (OFF) | RN2961~2964 | $V_{I(OFF)}$ | $V_{CE} = -5V, I_C = -0.1mA$ | -1.0 | — | -1.5 | V |
| | RN2965, 2966 | | | -0.5 | — | -0.8 | |
| Transition Frequency | RN2961~2966 | f_T | $V_{CE} = -10V, I_C = -5mA$ | — | 200 | — | MHz |
| Collector Output Capacitance | RN2961~2966 | C_{ob} | $V_{CB} = -10V, I_E = 0, f = 1MHz$ | — | 3 | 6 | pF |
| Input Resistor | RN2961 | R1 | | 3.29 | 4.7 | 6.11 | k Ω |
| | RN2962 | | | 7 | 10 | 13 | |
| | RN2963 | | | 15.4 | 22 | 28.6 | |
| | RN2964 | | | 32.9 | 47 | 61.1 | |
| | RN2965 | | | 1.54 | 2.2 | 2.86 | |
| | RN2966 | | | 3.29 | 4.7 | 6.11 | |
| Resistor Ratio | RN2961~2964 | R1 / R2 | | 0.9 | 1.0 | 1.1 | |
| | RN2965 | | | 0.0421 | 0.0468 | 0.0515 | |
| | RN2966 | | | 0.09 | 0.1 | 0.11 | |

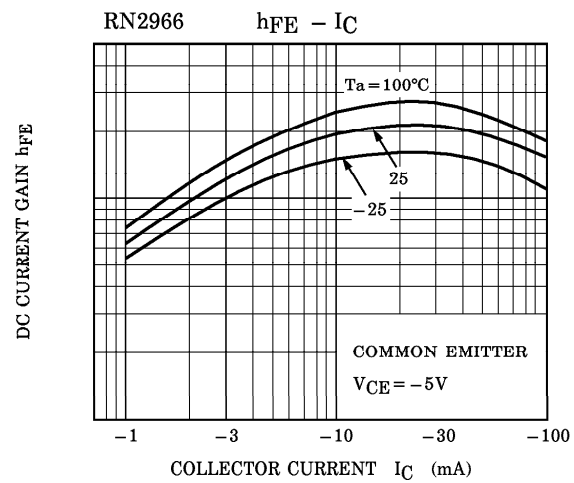
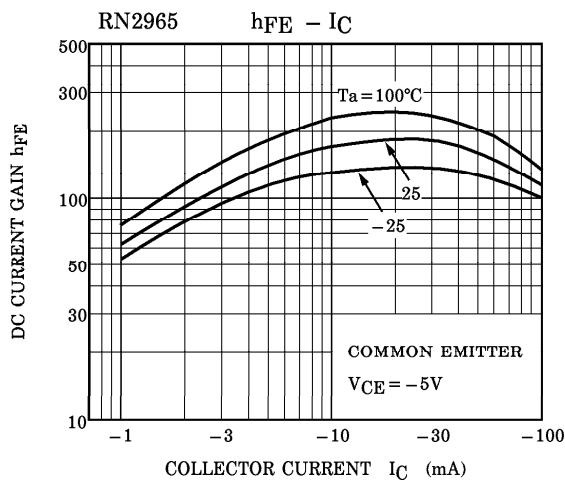
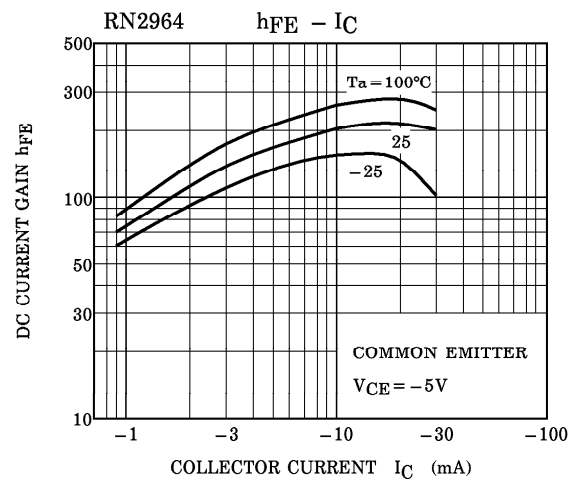
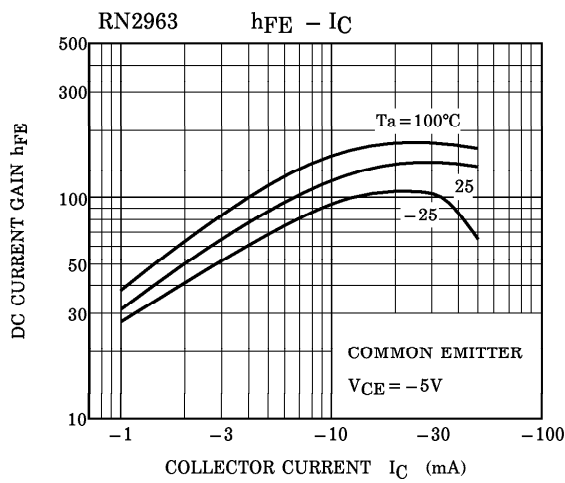
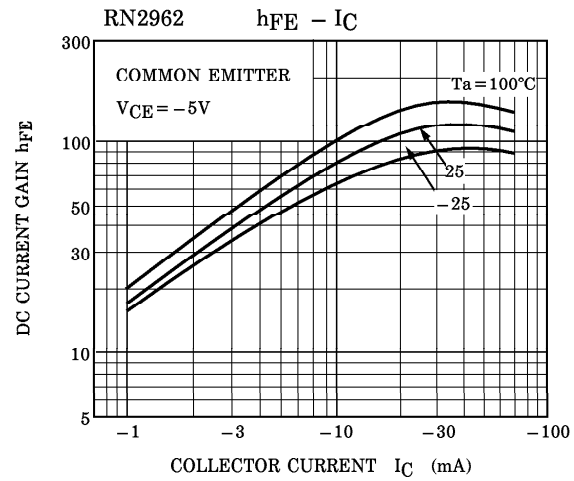
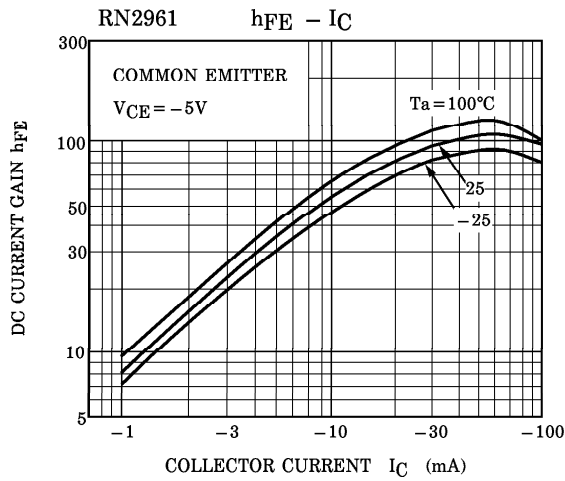
(Q1, Q2 COMMON)

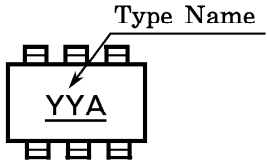
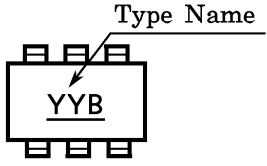
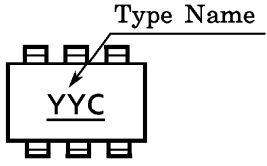
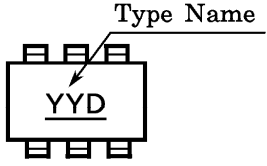
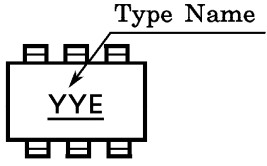
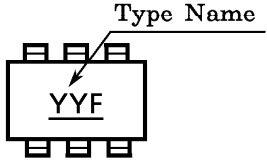


(Q1, Q2 COMMON)



(Q1, Q2 COMMON)



| TYPE NAME | MARKING |
|-----------|---|
| RN2961 |  |
| RN2962 |  |
| RN2963 |  |
| RN2964 |  |
| RN2965 |  |
| RN2966 |  |