

複合素子

■デュアルトランジスタ/Bipolar Dual Transistor

| 品名 Type No. | 品質 グレード | 用途 Use | 構造 Structure | 外形 Outline | 絶対最大定格/Absolute Maximum Ratings (Ta=25°C) | | | | | 電気的特性 | | |
|----------------|----------------|-----------|-----------------|---------------|--|-------------------------|-------------------------|-----------------------------------|-----------------------------------|------------------------|--|-------|
| | | | | | V _{CE0} (V) | V _{CE0} (V) | V _{BE0} (V) | I _c (mA) (/unit) | P _c (mW) (/unit) | T _j (°C) | I _{CS0} (μA) V _{CE} (V) | MAX. |
| 2SC294 | Q ₂ | Diff. | NPN, D, Si | TO-78(A) | 25 | 12 | 5 | 50 | 300 | 175 | 10 | 0.1 |
| 2SC603 | Q ₂ | Chop. | NPN, E, Si | TO-46類似 | 7 | *4.5 | 7 | 50 | *200 | 150 | 6.0 | 1.0 |
| μPA15A | Q ₂ | Diff. | NPN, D, Si | TO-78(A) | 25 | 12 | 5 | 50 | 300 | 150 | 10 | 0.1 |
| μPA36A | Q ₂ | Chop. | NPN, E, Si | TO-46類似 | 7 | *5 | 7 | 50 | *200 | 150 | 6.0 | 0.05 |
| μPA37A | Q ₂ | Diff. 5W | NPN, E, Si | TO-78(A) | 25 | 13 | 5 | 80 | 150 | 175 | 15 | 0.1 |
| μPA38A | Q ₂ | Diff. | NPN, E, Si | TO-78(B) | 60 | 40 | 5 | 50 | 300 | 175 | 15 | 100pA |
| μPA39A | Q ₂ | Diff. | NPN, E, Si | TO-78(B) | 60 | 40 | 5 | 50 | 300 | 175 | 15 | 500pA |
| μPA49A | Q ₂ | Diff. | PNP, E, Si | TO-78(B) | -60 | -40 | -5 | -50 | 300 | 175 | -30 | -0.1 |

⊠ 日本電信電話公社認定品 μPA37A-A, μPA36A-A, μPA49A-A * V_{CE0}

* 全損失

■デュアルFET/Dual FET

| 品名 Type No. | 品質 グレード | 用途 Use | 構造 Structure | 外形 Outline | 絶対最大定格/Absolute Maximum Ratings (Ta=25°C) | | | | | 電気的特性 | | | | |
|----------------|----------------|-------------|-----------------|---------------|--|------------------------|-----------------------------------|-----------------------------------|------------------------|---|--------|------------------------|---------------------------------------|-----|
| | | | | | V _{GS} (V) | V _{DS} (V) | I _D (mA) (/unit) | P _D (mW) (/unit) | T _j (°C) | I _{CS} (μA) V _{GS} (V) | MAX. | V _{DS} (V) | I _{DSS} (mA) TYP. MAX. | |
| μPA33A | Q ₂ | Chop. | P ch. MOS, Dual | TO-78(C) | ±30 | -30 | -20 | 100 | 125 | -10 | -10 | | | |
| μPA34A | Q ₂ | Chop. Diff. | N ch. MOS, Dual | TO-78(C) | ±30 | 20 | 10 | 100 | 125 | 10 | 10 | 10 | 0.6 | 2.5 |
| μPA60A | Q ₂ | Diff. | N ch. J, Dual | TO-78(D) | *-40 | *40 | *50 | 250 | 175 | -20 | -100 | 10 | 2.0 | 5.0 |
| μPA61A | Q ₂ | Diff. | N ch. J, Dual | TO-78(D) | *-40 | *40 | *50 | 250 | 175 | -20 | -100 | 10 | 2.0 | 5.0 |
| μPA62C | 一般 | Mix. | N ch. J, Dual | DIP(A) | *-20 | - | 32 | 350 | 125 | -8 | -50nA | 10 | 16 | 32 |
| μPA63H | 一般 | Diff. | N ch. J, Dual | SIP(A) | *-60 | *60 | 30 | 250 | 125 | -20 | -1.0nA | 10 | 6.0 | 20 |
| μPA70A | Q ₂ | Diff. | N ch. J, Dual | TO-71 | *-40 | *40 | *50 | 250 | 175 | -20 | -100 | 10 | 2.0 | 5.0 |
| μPA71A | Q ₂ | Diff. | N ch. J, Dual | TO-71 | *-40 | *40 | *50 | 250 | 175 | -20 | -100 | 10 | 2.0 | 5.0 |

* 品質グレード Q₂: 高信頼度通信工業用 * V_{GS0} * V_{DS} * I_c

Q₁: 通信工業用

Q₃: 軽工業用

太字で書かれた品種は主幹製品です。新規設計にはこれらの品種をおすすめします。

■外形図/Package Dimensions (Unit: mm)

| TO-78(A) | TO-46類似 | TO-78(B) | TO-78(C, D) |
|--|--|---|---|
| <p>Connection Diagram</p> <ol style="list-style-type: none"> Emitter 1 Base 1 Collector 1 Collector 2 Base 2 Emitter 2 <p>EIAJ : TC-5A, TB-25C JEDEC : MO-002AG IEC : C4</p> | <p>Connection Diagram</p> <ol style="list-style-type: none"> Base 1 Base 2 Emitter 2 Emitter 1 Collector (Case) <p>EIAJ : --- JEDEC : --- IEC : ---</p> | <p>Connection Diagram</p> <ol style="list-style-type: none"> Emitter 1 Base 1 Collector 1 Sub. Case 1 Collector 2 Base 2 Emitter 2 Sub. Case 2 <p>EIAJ : TC-5A, TB-26C JEDEC : MO-002AG (TO-78) IEC : C4, B7C</p> | <p>C. Connection Diagram</p> <ol style="list-style-type: none"> Source 1 Drain 1 Gate 1 Sub. (Case) Gate 2 Drain 2 Source 2 NC <p>D. Connection Diagram</p> <ol style="list-style-type: none"> Source 1 Drain 1 Gate 1 Sub. (Case) Source 2 Drain 2 Gate 2 Sub. (Case) <p>EIAJ : TC-5A, TB-26C JEDEC : MO-002AG (TO-78) IEC : C4, B7A (V_{GS}はV_{GS}38.1は異なる)</p> |

特に指定のない寸法は標準値を示します。

/Electrical Characteristics (Ta=25°C)

| V _{CE} / I _C (V) / (mA) | h _{FE} *h _{FE1} / h _{FE2} | | V _{CE(sat)} (V) | | | V _{IO} (mV) | | | Remarks | 品名 Type No. |
|--|--|------|--------------------------|--|------------|----------------------|--|---|---------|----------------|
| | MIN. | TYP. | MIN. | I _C / I _B (mA) / (mA) | TYP. | MAX. | V _{CE} / I _C (V) / (mA) | TYP. | | |
| 1.0 / 1.0 | 40 | 80 | 0.8 | 10 / 1.0 | 0.4 | 1.0 / 1.0 | 10 | fr ≈ 200 MHz, C _{is} ≈ 4.5 pF | 2SC294 | |
| 0.5 / 0.1 | 15 | 100 | | | | | | h _{FE} ≥ 15 | 2SC603 | |
| 1.0 / 1.0 | 40 | 100 | 0.8 | 10 / 1.0 | 0.4 | | | fr ≈ 200 MHz | μPA15A | |
| 0.5 / 1.0 | 20 | 50 | 0.8 | 1.0 / 0.1 | 0.015 0.15 | | | h _{FE} ≈ 12, ΔV _{BE} ≤ 50 μV | μPA36A | |
| 3.0 / 2.0 | 50 | 110 | 0.7 | 10 / 1.0 | 0.25 0.4 | | | t _{on} ≤ 15 ns, t _{off} ≤ 20 ns, t _{sat} ≤ 30 ns | μPA37A | |
| 5.0 / 1.0 | 300 | 550 | 0.9 | 10 / 1.0 | 0.4 0.6 | 5.0 / 10 μA | 0.5 1.0 | ΔV _{IO} /ΔT ≈ 1.5 μV/°C, NF ≈ 1.0 dB | μPA38A | |
| 5.0 / 1.0 | 300 | 500 | 0.8 | 10 / 1.0 | 0.4 0.6 | 5.0 / 10 μA | 2.0 5.0 | ΔV _{IO} /ΔT ≈ 6.0 μV/°C, NF ≈ 2.0 dB | μPA39A | |
| -1.0 / -1.0 | 80 | 150 | 0.0 | -10 / -1.0 | -0.25 -0.5 | -1.0 / -1.0 | 0.5 3.0 | f _T ≈ 250 MHz, NF ≈ 3.0 dB | μPA49A | |

* h_{FE1} < h_{FE2}

/Electrical Characteristics (Ta=25°C)

| V _{CE(sat)} (V) | | y _{fs} (mS) | | C _{iss} (pF) | | Remarks | 品名 Type No. | | | | |
|--|-------|------------------------|------|--|------|---------|----------------|------|--|---|--------|
| V _{DS} / I _D (V) / (μA) | MIN. | TYP. | MAX. | V _{DS} / I _D (V) / (mA) | MIN. | | | TYP. | V _{DS} / V _{GS} (V) / (V) | TYP. | MAX. |
| -10 / -10 | -2.5 | -3.5 | -5.5 | -10 / -1.0 | 1.0 | 2.0 | 0 / 0 | 15 | 20 | Δy _{fs} ≤ 10%, R _{DS(on)} ≤ 500 Ω | μPA33A |
| 10 / 50 | | | -5.0 | 10 / I _{DSS} | 0.3 | 0.6 | 10 / 0 | 4.0 | | C _{is} ≈ 4 pF, ΔI _{DSS} ≤ 0.1 mA | μPA34A |
| 10 / 10 | -0.2 | -1.0 | -2.5 | 10 / 0.5 | 1.0 | 2.0 | 10 / 0 | 2.5 | 5.0 | V _{GS1} - V _{GS2} ≤ 5.0 mV | μPA60A |
| 10 / 10 | -0.2 | -1.0 | -2.5 | 10 / 0.5 | 1.0 | 2.0 | 10 / 0 | 2.5 | 5.0 | V _{GS1} - V _{GS2} ≤ 40 mV | μPA61A |
| 10 / 10 | -0.35 | | -2.2 | 10 / 3.0 | 12.5 | 15 | 10 / *3.0 | 7.5 | | G _{m(max)} = 12 dB TYP. (400 MHz) | μPA62C |
| 10 / 10 | -0.3 | -1.3 | -4.2 | 10 / 1.0 | 2.0 | 4.0 | 10 / 0 | 6.0 | 8.0 | e _n ≤ 30 nV/√Hz (10 Hz) | μPA63H |
| 10 / 10 | -0.2 | -1.0 | -2.5 | 10 / 0.5 | 1.0 | 2.0 | 10 / 0 | 2.5 | 5.0 | V _{GS1} - V _{GS2} ≤ 5.0 mV | μPA70A |
| 10 / 10 | -0.2 | -1.0 | -2.5 | 10 / 0.5 | 1.0 | 2.0 | 10 / 0 | 2.5 | 5.0 | V _{GS1} - V _{GS2} ≤ 40 mV | μPA71A |

* I_D

