



SANYO Semiconductors

## DATA SHEET

15GN01NA

NPN Epitaxial Planar Silicon Transistor

VHF to UHF Band High-Frequency Switching,  
High-Frequency General-Purpose Amplifier Applications

## Features

- Small ON-resistance [ $R_{on}=2\Omega$  ( $I_B=3mA$ )].
- Small output capacitance [ $C_{ob}=1.3pF$  ( $V_{CB}=10V$ )].

## Specifications

Absolute Maximum Ratings at  $T_a=25^\circ C$ 

| Parameter                    | Symbol    | Conditions | Ratings     | Unit       |
|------------------------------|-----------|------------|-------------|------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |            | 15          | V          |
| Collector-to-Emitter Voltage | $V_{CEO}$ |            | 8           | V          |
| Emitter-to-Base Voltage      | $V_{EBO}$ |            | 3           | V          |
| Collector Current            | $I_C$     |            | 50          | mA         |
| Collector Dissipation        | $P_C$     |            | 400         | mW         |
| Junction Temperature         | $T_j$     |            | 150         | $^\circ C$ |
| Storage Temperature          | $T_{stg}$ |            | -55 to +150 | $^\circ C$ |

Electrical Characteristics at  $T_a=25^\circ C$ 

| Parameter                               | Symbol        | Conditions            | Ratings |      |      | Unit     |
|---|---------------|-----------------------|---------|------|------|----------|
|   |               |                       | min     | typ  | max  |          |
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB}=10V, I_E=0A$  |         |      | 0.5  | $\mu A$  |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB}=2V, I_C=0A$   |         |      | 0.5  | $\mu A$  |
| DC Current Gain                         | $h_{FE}$      | $V_{CE}=5V, I_C=10mA$ | 200     |      | 400  |          |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE}=5V, I_C=10mA$ | 1.0     | 1.5  |      | GHz      |
| Output Capacitance                      | $C_{ob}$      | $V_{CB}=10V, f=1MHz$  |         | 1.3  |      | pF       |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=20mA, I_B=2mA$   |         | 0.06 | 0.12 | V        |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=20mA, I_B=2mA$   |         | 0.85 | 1.0  | V        |
| Output ON resistance                    | $R_{on}$      | $I_B=3mA, f=10kHz$    |         | 2.0  |      | $\Omega$ |

Marking : ZA

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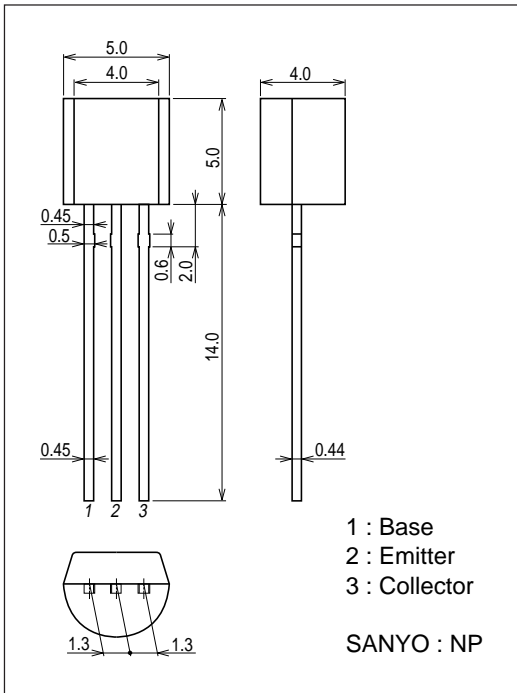
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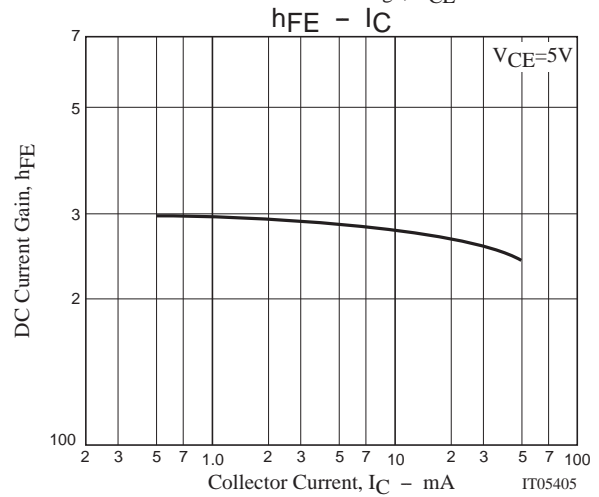
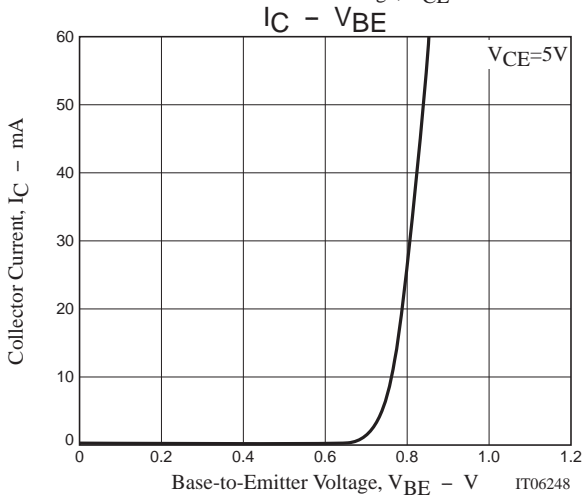
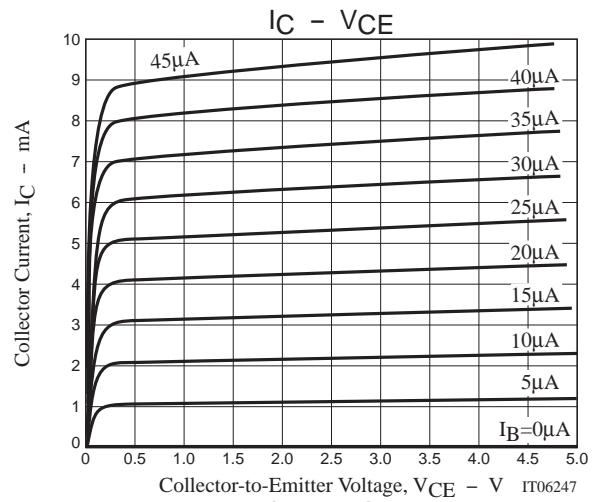
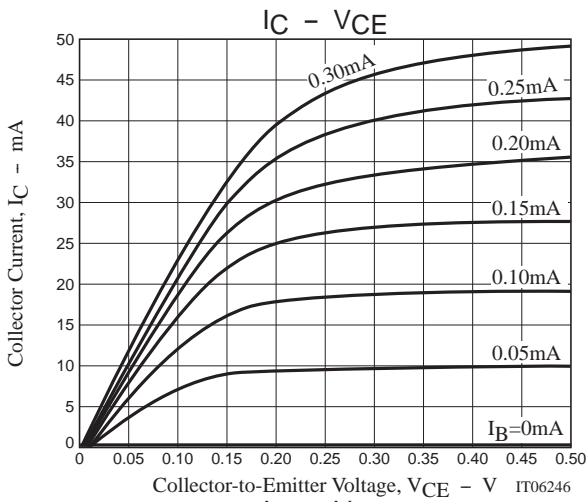
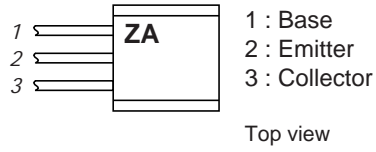
## Package Dimensions

unit : mm (typ)  
7522-003

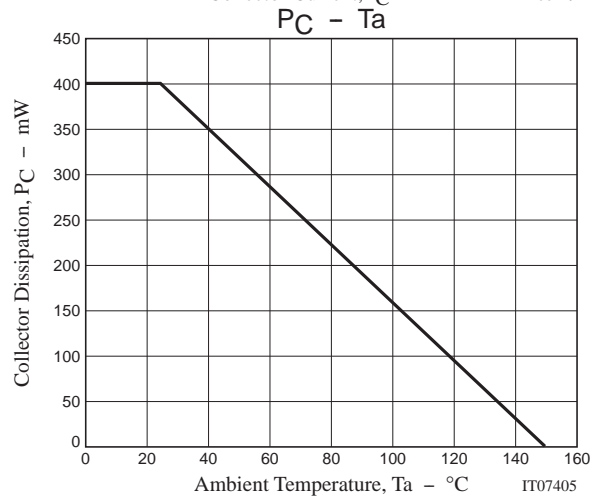
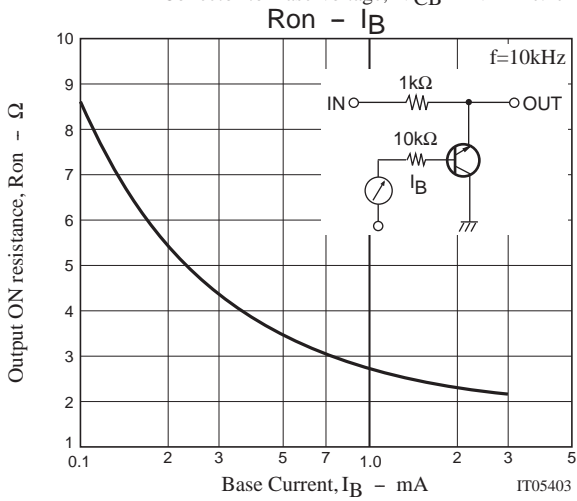
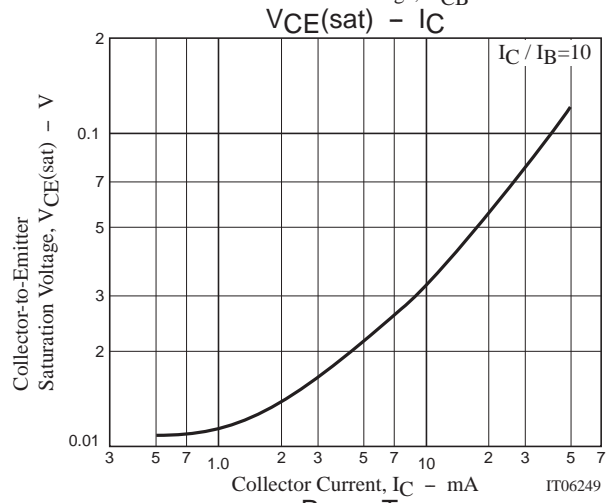
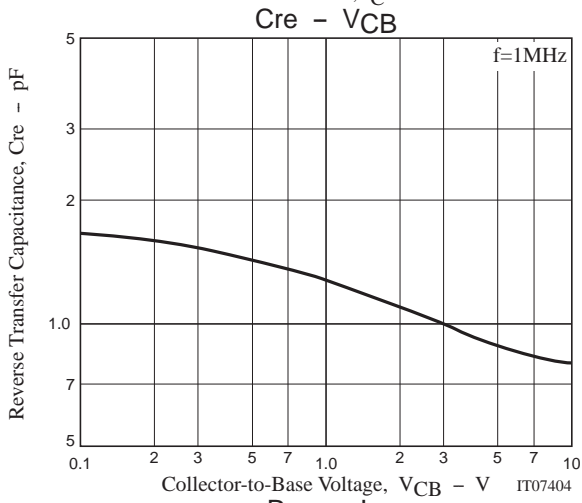
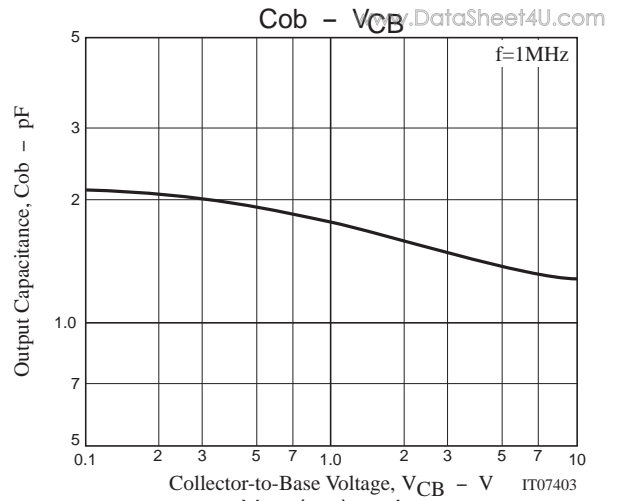
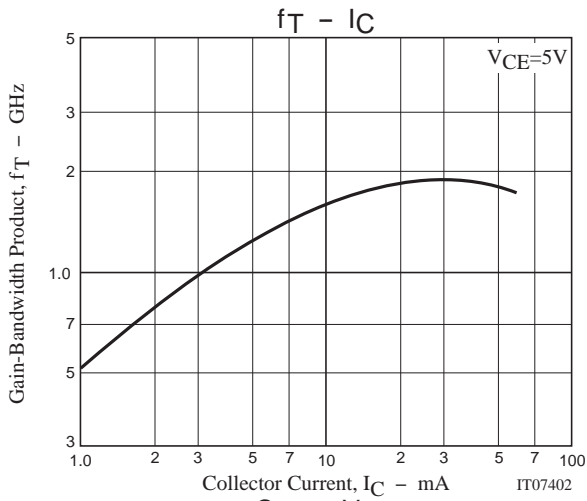


## Marking

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# 15GN01NA



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## S Parameters (Common emitter)

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$V_{CE}=5V, I_C=5mA, Z_O=50\Omega$

| Freq(MHz) | $ S_{11} $ | $\angle S_{11}$ | $ S_{21} $ | $\angle S_{21}$ | $ S_{12} $ | $\angle S_{12}$ | $ S_{22} $ | $\angle S_{22}$ |
|-----------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| 100       | 0.679      | -22.58          | 4.139      | 116.73          | 0.032      | 73.31           | 0.753      | -12.33          |
| 200       | 0.580      | -32.46          | 2.688      | 103.88          | 0.061      | 70.84           | 0.727      | -16.89          |
| 300       | 0.499      | -42.23          | 2.117      | 92.82           | 0.087      | 66.96           | 0.703      | -22.87          |
| 400       | 0.424      | -51.43          | 1.807      | 81.91           | 0.111      | 62.96           | 0.682      | -28.63          |
| 500       | 0.349      | -61.62          | 1.615      | 70.91           | 0.135      | 58.65           | 0.660      | -35.63          |
| 600       | 0.262      | -71.70          | 1.468      | 60.67           | 0.158      | 54.60           | 0.629      | -42.07          |
| 700       | 0.192      | -84.86          | 1.372      | 50.52           | 0.181      | 51.41           | 0.605      | -48.82          |
| 800       | 0.118      | -108.67         | 1.295      | 39.92           | 0.205      | 47.69           | 0.571      | -57.87          |
| 900       | 0.073      | -160.50         | 1.241      | 29.90           | 0.231      | 44.42           | 0.539      | -66.04          |
| 1000      | 0.103      | 145.75          | 1.176      | 19.87           | 0.258      | 40.51           | 0.508      | -76.99          |

$V_{CE}=5V, I_C=10mA, Z_O=50\Omega$

| Freq(MHz) | $ S_{11} $ | $\angle S_{11}$ | $ S_{21} $ | $\angle S_{21}$ | $ S_{12} $ | $\angle S_{12}$ | $ S_{22} $ | $\angle S_{22}$ |
|-----------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| 100       | 0.609      | -25.35          | 5.809      | 112.60          | 0.031      | 75.01           | 0.685      | -12.89          |
| 200       | 0.501      | -36.26          | 3.667      | 99.43           | 0.058      | 72.48           | 0.659      | -16.87          |
| 300       | 0.414      | -46.23          | 2.800      | 87.86           | 0.084      | 69.11           | 0.635      | -22.47          |
| 400       | 0.335      | -55.33          | 2.316      | 76.81           | 0.109      | 65.86           | 0.615      | -27.84          |
| 500       | 0.260      | -65.69          | 2.015      | 66.02           | 0.134      | 61.84           | 0.595      | -34.52          |
| 600       | 0.177      | -76.44          | 1.787      | 56.16           | 0.159      | 57.57           | 0.564      | -40.75          |
| 700       | 0.114      | -92.81          | 1.635      | 46.31           | 0.184      | 54.11           | 0.540      | -47.33          |
| 800       | 0.058      | -140.97         | 1.517      | 36.10           | 0.212      | 49.91           | 0.505      | -56.20          |
| 900       | 0.077      | 143.92          | 1.431      | 26.37           | 0.240      | 45.96           | 0.471      | -64.20          |
| 1000      | 0.138      | 119.67          | 1.339      | 16.71           | 0.269      | 41.37           | 0.437      | -75.11          |

$V_{CE}=5V, I_C=20mA, Z_O=50\Omega$

| Freq(MHz) | $ S_{11} $ | $\angle S_{11}$ | $ S_{21} $ | $\angle S_{21}$ | $ S_{12} $ | $\angle S_{12}$ | $ S_{22} $ | $\angle S_{22}$ |
|-----------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| 100       | 0.527      | -29.52          | 7.559      | 108.11          | 0.030      | 76.02           | 0.623      | -12.91          |
| 200       | 0.410      | -41.38          | 4.581      | 93.88           | 0.057      | 74.93           | 0.600      | -16.23          |
| 300       | 0.321      | -51.81          | 3.369      | 81.99           | 0.083      | 71.96           | 0.580      | -21.57          |
| 400       | 0.243      | -61.31          | 2.711      | 70.96           | 0.109      | 68.01           | 0.563      | -26.84          |
| 500       | 0.172      | -73.24          | 2.304      | 60.45           | 0.135      | 63.89           | 0.545      | -33.46          |
| 600       | 0.095      | -90.10          | 2.005      | 50.91           | 0.162      | 59.42           | 0.515      | -39.60          |
| 700       | 0.047      | -132.96         | 1.802      | 41.36           | 0.189      | 55.50           | 0.491      | -46.17          |
| 800       | 0.070      | 143.26          | 1.650      | 31.52           | 0.219      | 50.95           | 0.455      | -55.15          |
| 900       | 0.135      | 116.79          | 1.535      | 22.05           | 0.249      | 46.42           | 0.418      | -63.06          |
| 1000      | 0.198      | 106.08          | 1.422      | 12.75           | 0.279      | 41.29           | 0.382      | -74.27          |

$V_{CE}=5V, I_C=30mA, Z_O=50\Omega$

| Freq(MHz) | $ S_{11} $ | $\angle S_{11}$ | $ S_{21} $ | $\angle S_{21}$ | $ S_{12} $ | $\angle S_{12}$ | $ S_{22} $ | $\angle S_{22}$ |
|-----------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| 100       | 0.472      | -32.94          | 8.468      | 104.99          | 0.029      | 78.19           | 0.591      | -12.70          |
| 200       | 0.352      | -45.65          | 4.970      | 90.19           | 0.056      | 76.06           | 0.572      | -15.72          |
| 300       | 0.263      | -56.94          | 3.580      | 78.26           | 0.083      | 72.60           | 0.554      | -21.08          |
| 400       | 0.187      | -68.09          | 2.838      | 67.30           | 0.110      | 68.99           | 0.539      | -26.31          |
| 500       | 0.119      | -84.10          | 2.386      | 56.82           | 0.136      | 65.03           | 0.522      | -32.99          |
| 600       | 0.053      | -121.65         | 2.056      | 47.51           | 0.164      | 60.04           | 0.492      | -39.20          |
| 700       | 0.053      | 160.07          | 1.832      | 38.08           | 0.193      | 55.97           | 0.467      | -45.88          |
| 800       | 0.115      | 124.21          | 1.664      | 28.36           | 0.223      | 50.92           | 0.430      | -54.94          |
| 900       | 0.182      | 109.00          | 1.537      | 19.11           | 0.254      | 46.26           | 0.391      | -62.99          |
| 1000      | 0.244      | 100.79          | 1.417      | 9.97            | 0.284      | 40.99           | 0.354      | -74.28          |

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