

# 1A5/1A5A

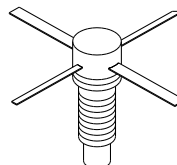
0.5 Watts, 20 Volts, Class A  
Linear to 1000 MHz

## GENERAL DESCRIPTION

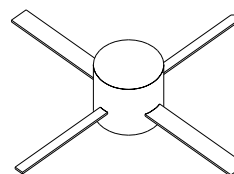
The 1A5/1A5A is a COMMON EMITTER transistor capable of providing 0.5 Watt of Class A, RF output power to 1000 MHz. This transistor is specifically designed for general Class A amplifier applications. It utilizes gold metalization and diffused ballasting to provide high reliability and supreme ruggedness.

## CASE OUTLINE

### 1A5 - 55ET, STYLE 2



### 1A5A - 55EU, STYLE 2



## ABSOLUTE MAXIMUM RATINGS

|                                    |                              |                 |
|------------------------------------|------------------------------|-----------------|
| Maximum Power Dissipation @ 25°C   |                              | 5.3 Watts       |
| <b>Maximum Voltage and Current</b> |                              |                 |
| BVces                              | Collector to Emitter Voltage | 50 Volts        |
| BVebo                              | Emitter to Base Voltage      | 3.5 Volts       |
| Ic                                 | Collector Current            | 300 mAmps       |
| <b>Maximum Temperatures</b>        |                              |                 |
| Storage Temperature                |                              | - 65 to + 150°C |
| Operating Junction Temperature     |                              | + 150°C         |

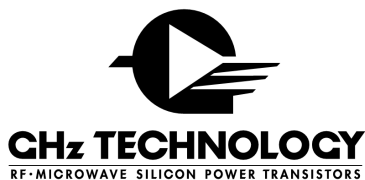
## ELECTRICAL CHARACTERISTICS @ 25 °C

| SYMBOL      | CHARACTERISTICS         | TEST CONDITIONS        | MIN | TYP | MAX  | UNITS |
|-------------|-------------------------|------------------------|-----|-----|------|-------|
| <b>Pout</b> | Power Out               | F = 1000 MHz           | 0.5 | 0.8 |      | Watts |
| <b>Pin</b>  | Power Input             | Ic = 140 mA            |     |     | 0.1  | Watts |
| <b>Pg</b>   | Power Gain              | Vcc = 20 Volts         | 7.0 | 9.0 |      | dB    |
| <b>Ft</b>   | Transition Frequency    | Vce = 20 V, Ic = 140 A | 3.4 | 3.7 |      | GHz   |
| <b>VSWR</b> | Load Mismatch Tolerance |                        |     |     | 30:1 |       |

|              |                                |                        |     |     |     |       |
|--------------|--------------------------------|------------------------|-----|-----|-----|-------|
| <b>BVebo</b> | Emitter to Base Breakdown      | Ie = 1 mA              | 3.5 |     |     | Volts |
| <b>BVces</b> | Collector to Emitter Breakdown | Ic = 10 mA             | 50  |     |     | Volts |
| <b>BVceo</b> | Collector to Emitter Breakdown | Ic = 10 mA             | 22  |     |     | Volts |
| <b>hFE</b>   | DC Current Gain                | Vce = 5 V, Ic = 100 mA | 20  |     |     |       |
| <b>Cob</b>   | Capacitance                    | Vcb = 28V, f = 1 MHz   |     | 2.0 | 3.0 | pF    |
| <b>θjc</b>   | Thermal Resistance             |                        |     |     | 33  | °C/W  |

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**1A5-1 (20V, 140mA)**

MMICAD for Windows Thu Jul 07 10:37:10 1994  
CIRCUIT: MES

| FREQ  | --- S11 --- |          | --- S21 --- |          | --- S12 --- |         | --- S22 --- |          |
|-------|-------------|----------|-------------|----------|-------------|---------|-------------|----------|
| Mhz   | MAG         | ANG      | MAG         | ANG      | MAG         | ANG     | MAG         | ANG      |
| 0.100 | 0.56197     | -118.034 | 18.6642     | 125.747  | 0.02346     | 48.6914 | 0.66256     | -30.6240 |
| 0.200 | 0.64716     | -150.326 | 11.3045     | 104.740  | 0.03016     | 42.6533 | 0.48594     | -35.6573 |
| 0.300 | 0.66746     | -165.106 | 7.92501     | 91.4178  | 0.03454     | 43.2209 | 0.41927     | -36.6118 |
| 0.400 | 0.67801     | -174.637 | 6.06913     | 82.9121  | 0.03864     | 46.8894 | 0.38867     | -37.7101 |
| 0.500 | 0.68139     | 178.284  | 4.90250     | 76.6423  | 0.04311     | 49.5566 | 0.37282     | -39.8308 |
| 0.600 | 0.68620     | 172.552  | 4.11443     | 70.4426  | 0.04811     | 52.5068 | 0.36423     | -42.7066 |
| 0.700 | 0.69055     | 167.426  | 3.54426     | 63.8687  | 0.05377     | 54.0348 | 0.35804     | -46.2386 |
| 0.800 | 0.69700     | 162.820  | 3.11620     | 58.3477  | 0.06001     | 55.6629 | 0.35415     | -50.2354 |
| 0.900 | 0.70199     | 158.318  | 2.78278     | 53.0640  | 0.06657     | 56.9896 | 0.35119     | -54.4971 |
| 1.000 | 0.70826     | 154.007  | 2.51809     | 48.0165  | 0.07339     | 57.7591 | 0.35033     | -59.0618 |
| 1.100 | 0.71280     | 149.869  | 2.29876     | 43.0384  | 0.08117     | 58.2481 | 0.35003     | -64.0534 |
| 1.200 | 0.71780     | 145.924  | 2.11370     | 38.1837  | 0.08921     | 58.1633 | 0.34957     | -69.3708 |
| 1.300 | 0.72548     | 142.122  | 1.95811     | 33.4230  | 0.09798     | 58.0397 | 0.35039     | -74.8414 |
| 1.400 | 0.73212     | 138.400  | 1.82250     | 28.7884  | 0.10688     | 57.4626 | 0.35131     | -80.5688 |
| 1.500 | 0.73986     | 134.579  | 1.70672     | 24.1756  | 0.11649     | 56.7472 | 0.35355     | -86.4547 |
| 1.600 | 0.74477     | 131.202  | 1.60673     | 19.6908  | 0.12698     | 55.7453 | 0.35696     | -92.7084 |
| 1.700 | 0.75897     | 127.737  | 1.51655     | 14.8886  | 0.13832     | 54.1686 | 0.36172     | -99.3589 |
| 1.800 | 0.77204     | 123.622  | 1.42225     | 10.1418  | 0.14858     | 52.1560 | 0.36201     | -106.275 |
| 1.900 | 0.77410     | 119.891  | 1.33334     | 6.05933  | 0.15897     | 50.6428 | 0.36350     | -112.686 |
| 2.000 | 0.78006     | 116.572  | 1.26320     | 2.21040  | 0.17065     | 49.0896 | 0.36895     | -118.732 |
| 2.100 | 0.78867     | 113.312  | 1.20012     | -1.76531 | 0.18335     | 47.1209 | 0.37657     | -125.255 |
| 2.200 | 0.79450     | 109.901  | 1.14017     | -5.88124 | 0.19633     | 44.7376 | 0.38764     | -132.094 |
| 2.300 | 0.80140     | 106.879  | 1.08157     | -9.73194 | 0.20846     | 42.3995 | 0.39868     | -139.274 |
| 2.400 | 0.80906     | 103.725  | 1.02767     | -13.4143 | 0.22087     | 40.0596 | 0.40885     | -146.159 |
| 2.500 | 0.81698     | 100.574  | 0.98099     | -16.9480 | 0.23481     | 37.6041 | 0.42098     | -152.920 |
| 2.600 | 0.82265     | 97.6757  | 0.93413     | -20.5254 | 0.24796     | 35.0025 | 0.43531     | -159.748 |
| 2.700 | 0.83038     | 94.7662  | 0.88904     | -24.0245 | 0.26179     | 32.0739 | 0.44776     | -166.518 |
| 2.800 | 0.83873     | 91.7801  | 0.84597     | -27.2655 | 0.27514     | 29.2000 | 0.46057     | -172.939 |
| 2.900 | 0.84731     | 88.8142  | 0.80361     | -30.3634 | 0.28841     | 26.2755 | 0.47219     | -179.090 |
| 3.000 | 0.85351     | 85.8301  | 0.76428     | -33.2211 | 0.30117     | 23.2664 | 0.48416     | 174.870  |

MMICAD for Windows Thu Jul 07 11:21:52 1994

CIRCUIT: MES

| FREQ  | --- S11 --- |          | --- S21 --- |          | --- S12 --- |         | --- S22 --- |          |
|-------|-------------|----------|-------------|----------|-------------|---------|-------------|----------|
|       | MAG         | ANG      | MAG         | ANG      | MAG         | ANG     | MAG         | ANG      |
| 0.100 | 0.58304     | -119.352 | 19.7456     | 125.102  | 0.02249     | 47.1124 | 0.65083     | -31.5653 |
| 0.200 | 0.66825     | -151.052 | 11.8398     | 104.266  | 0.02892     | 41.3075 | 0.47388     | -36.9652 |
| 0.300 | 0.68520     | -165.680 | 8.26397     | 90.8745  | 0.03208     | 43.0808 | 0.40504     | -37.9117 |
| 0.400 | 0.69605     | -174.978 | 6.32221     | 82.5367  | 0.03594     | 45.8869 | 0.37477     | -39.0763 |
| 0.500 | 0.70003     | 178.113  | 5.10374     | 76.4679  | 0.04107     | 48.7073 | 0.35927     | -41.1651 |
| 0.600 | 0.70413     | 172.399  | 4.27846     | 70.3023  | 0.04560     | 51.6128 | 0.35033     | -44.0693 |
| 0.700 | 0.70828     | 167.409  | 3.68181     | 63.7383  | 0.05060     | 53.4857 | 0.34489     | -47.6321 |
| 0.800 | 0.71409     | 162.884  | 3.23483     | 58.2392  | 0.05652     | 55.3151 | 0.34158     | -51.5310 |
| 0.900 | 0.71905     | 158.386  | 2.88540     | 52.9670  | 0.06230     | 56.2583 | 0.33975     | -55.8226 |
| 1.000 | 0.72442     | 154.120  | 2.60899     | 48.0111  | 0.06873     | 56.8526 | 0.33865     | -60.2820 |
| 1.100 | 0.72842     | 150.051  | 2.38026     | 43.1257  | 0.07572     | 57.3954 | 0.33856     | -65.1751 |
| 1.200 | 0.73307     | 146.148  | 2.18905     | 38.2690  | 0.08301     | 57.3929 | 0.33864     | -70.2119 |
| 1.300 | 0.74057     | 142.374  | 2.02548     | 33.5281  | 0.09082     | 57.0957 | 0.33917     | -75.5144 |
| 1.400 | 0.74718     | 138.631  | 1.88564     | 28.9118  | 0.09894     | 56.5693 | 0.34039     | -81.1047 |
| 1.500 | 0.75409     | 134.869  | 1.76517     | 24.3264  | 0.10718     | 55.8482 | 0.34200     | -86.7750 |
| 1.600 | 0.75846     | 131.388  | 1.65873     | 19.8649  | 0.11637     | 54.9782 | 0.34567     | -92.6800 |
| 1.700 | 0.77124     | 127.909  | 1.56390     | 15.1527  | 0.12616     | 53.4418 | 0.35055     | -99.0282 |
| 1.800 | 0.78299     | 123.818  | 1.46934     | 10.6433  | 0.13525     | 51.8347 | 0.35429     | -105.126 |
| 1.900 | 0.78501     | 120.143  | 1.38441     | 6.56621  | 0.14516     | 50.2911 | 0.35906     | -111.414 |
| 2.000 | 0.79127     | 116.832  | 1.31382     | 2.46843  | 0.15552     | 48.6219 | 0.36679     | -117.688 |
| 2.100 | 0.79976     | 113.486  | 1.24865     | -1.68308 | 0.16625     | 46.6742 | 0.37570     | -123.782 |
| 2.200 | 0.80412     | 110.055  | 1.18433     | -5.92758 | 0.17678     | 44.3209 | 0.38703     | -130.561 |
| 2.300 | 0.81028     | 106.962  | 1.12415     | -9.88802 | 0.18731     | 42.0832 | 0.39849     | -137.262 |
| 2.400 | 0.81682     | 103.853  | 1.06677     | -13.7167 | 0.19749     | 40.0274 | 0.40855     | -143.843 |
| 2.500 | 0.82390     | 100.741  | 1.01601     | -17.3805 | 0.20891     | 37.8323 | 0.41979     | -150.205 |
| 2.600 | 0.83138     | 97.7767  | 0.96810     | -20.9896 | 0.22081     | 35.3535 | 0.43131     | -156.609 |
| 2.700 | 0.83919     | 94.8120  | 0.92212     | -24.5561 | 0.23243     | 32.6083 | 0.44222     | -162.886 |
| 2.800 | 0.84759     | 91.7483  | 0.87835     | -27.9806 | 0.24381     | 29.8168 | 0.45369     | -168.825 |
| 2.900 | 0.85685     | 88.6599  | 0.83470     | -31.3899 | 0.25488     | 26.8457 | 0.46462     | -174.659 |
| 3.000 | 0.86329     | 85.5492  | 0.79328     | -34.5083 | 0.26440     | 23.9809 | 0.47509     | 179.719  |