RF Products
Microsemi
Progress Powered by Technology

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2N5641
2N5642/2N5643

RF & MICROWAVE TRANSISTORS
130...230MHz FM MOBILE APPLICATIONS

- FREQUENCY 175MHz
- VOLTAGE 28V
- HIGH POWER OUT 7 TO 40W
- HIGH POWER GAIN
- EFFICIENCY
- CLASS C TRANSISTORS
- COMMON EMITTER

.380 Narrow 4LSTUD
(M104)
epoxy sealed
ORDER CODE
SD1220
SD1222-10
SD1224

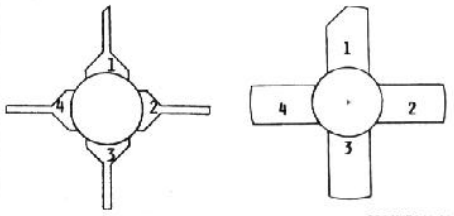
.380 4LSTUD
(M135)
epoxy sealed
BRANDING
2N5641
2N5642
2N5643

DESCRIPTION

These devices are epitaxial silicon NPN-planar transistors designed primarily for 12.5V AM class C RF amplifiers functional in the aviation band 118-136MHz and for 28V FM class C RF amplifiers utilized in ground station transmitters. These devices utilize ballasted emitter resistors and improved metallization systems to achieve optimum load mismatch capability.

Device	Package
2N5641	.380 Narrow 4LSTUD
2N5642	.380 4LSTUD
2N5643	.380 4LSTUD

PIN CONNECTION



S882N5641.01

1 collector
2 emitter
3 base
4 emitter

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	2N5641	2N5642	2N5643	Unit
V_{CBO}	Collector to Base Voltage	65	65	65	V
V_{CEO}	Collector to Emitter Voltage	35	35	35	V
V_{EBO}	Emitter to Base Voltage	4.0	4.0	4.0	V
$I_{C\ (max)}$	Continuous Collector Current	1.0	3.0	5.0	A
P_D	Total Dissipation at 25°C Stud	15	30	60	W
T_j	Junction Temperature	200	200	200	°C
T_{stg}	Storage Temperature	– 65 to 150	– 65 to 150	– 65 to 150	°C

		2N5641	2N5642	2N5643	
$R_{th(j-c)}$	Junction-case Thermal Resistance	11.7	5.8	2.9	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C)

STATIC

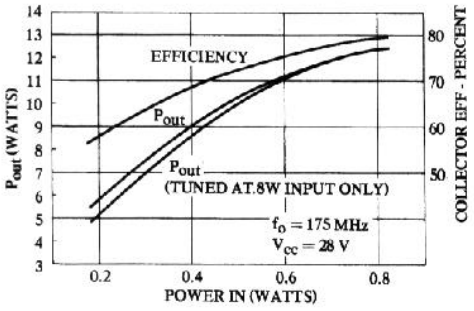
Symbol	Test Conditions		2N5641			2N5642			2N5643			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
BV_{CES}	I_C = 200mA	V_{BE} = 0	65			65			65			V
BV_{CEO}	I_C = 200mA	I_B = 0	35			35			35			V
BV_{EBO}	I_E = 10mA	I_C = 0	4	(I_E = 5mA)		4			4			V
I_{CBO}	V_{CB} = 30V	I_E = 0			1			1			1	mA
h_{FE}	V_{CE} = 5V	I_C = 200mA	5	(I_C = 100mA)		5			5	(I_C = 500mA)		

DYNAMIC

Symbol	Test Conditions		2N5641			2N5642			2N5643			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
P_O	F = 175MHz Class C	V_{CE} = 28V	7			20			40			W
G_p	F = 175MHz Class C	V_{CE} = 28V	8.4			8.2			7.6			dB
η_C	F = 175MHz Class C	V_{CB} = 28V	60			60			60			%
C_{OB}	V_{CB} = 30V F = 1MHz	I_C = 0			15			35			65	pF

APPLICATION INFORMATION (typical curves)

2N5641



Power Output vs Power Input

S882N5641-02

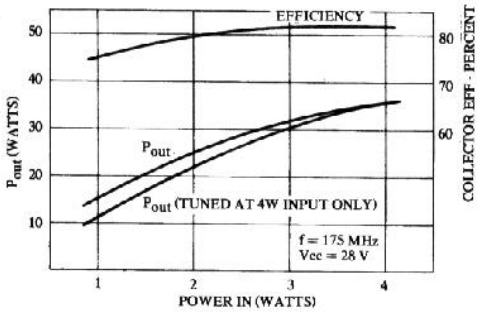
IMPEDANCE DATA (typical)

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f = 175MHz,		V_{CC} = 28V	
P_{IN} Watts	P_{OUT} Watts	Input Ohms	Output Ohms
0.2	5.8	2.15 – j1.95	23.23 – j29.68
0.4	9.08	2.42 – j1.57	22.08 – j29.50
0.6	11.19	2.52 – j1.15	21.80 – j29.15
0.8	12.67	2.57 – j5.25	18.55 – j30.38

APPLICATION INFORMATION (typical curves) (continued)

2N5642



Power Output vs Power Input

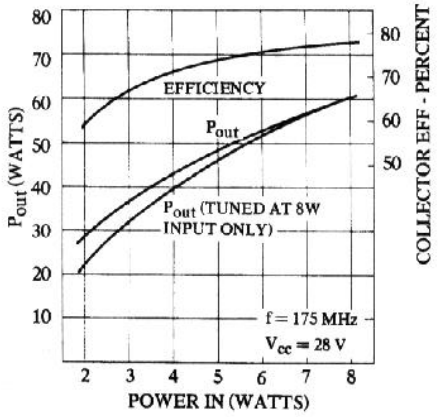
S882N5642-01

IMPEDANCE DATA (typical) (continued)

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f = 175MHz,		V_{CC} = 28V	
P_{IN} Watts	P_{OUT} Watts	Input Ohms	Output Ohms
1.0	15.3	1.0 + j1.15	10.22 – j14.90
2.0	24.9	1.07 + j1.30	9.42 – j12.37
3.0	31.7	1.12 + j1.15	9.00 – j 9.60
4.0	35.9	1.20 + j1.25	9.92 – j 8.00

2N5643



Power Output vs Power Input

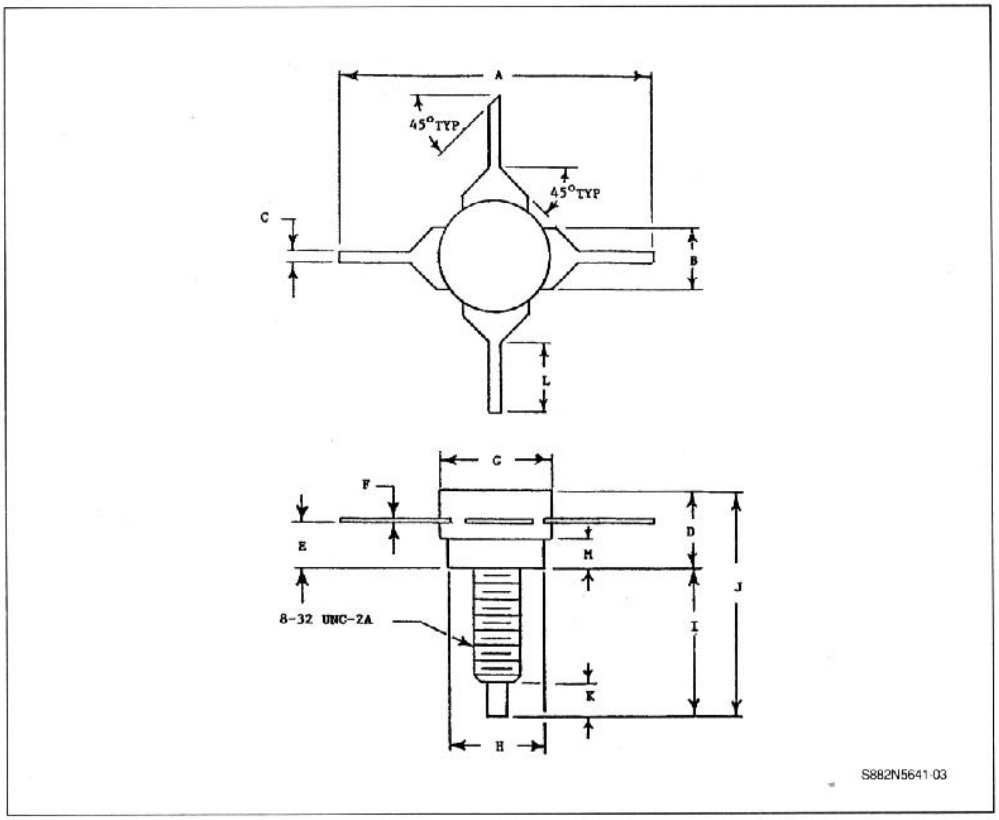
S882N5643-01

NETWORK IMPEDANCE AT TRANSISTOR TERMINALS

f = 175MHz,		V_{CC} = 28V	
P_{IN} Watts	P_{OUT} Watts	Input Ohms	Output Ohms
2.0	28.5	.85 + j1.20	3.25 – j7.05
4.0	43.0	1.02 + j1.32	4.45 – j5.40
6.0	53.0	1.01 + j1.42	5.25 – j4.42
8.0	60.5	1.05 + j1.35	5.45 – j4.12

PACKAGE MECHANICAL DATA

.380 NARROW 4LSTUD

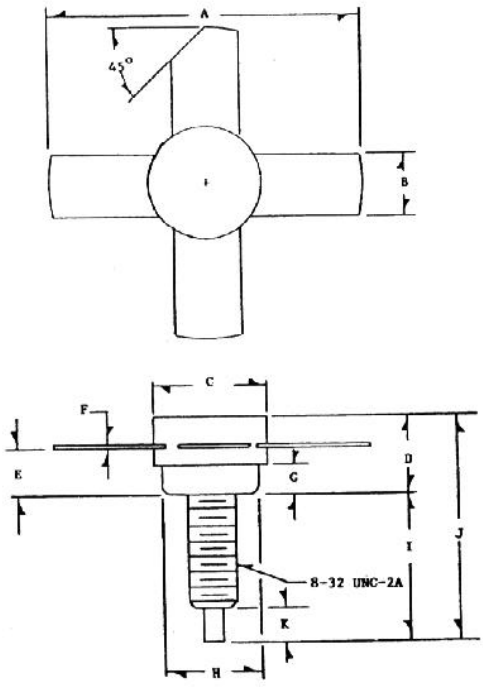


	Minimum Inches	Maximum Inches
A	1.000	
B	.220	.230
C	.025	.035
D		.275
E	.155	.175
F	.004	.007
G	.370	.380

	Minimum Inches	Maximum Inches
H	.320	.330
I	.450	.490
J		.750
K	.100	.130
L	.220	
M	.090	.100

PACKAGE MECHANICAL DATA (continued)

.380 4LSTUD



S882N5642.02

	Minimum Inches	Maximum Inches
A	.980	
B	.220	.230
C	.370	.385
D		.275
E	.155	.175
F	.004	.007

	Minimum Inches	Maximum Inches
G	.090	.100
H	.320	.330
I	.450	.490
J		.750
K	.100	.130