

2N918, JAN 2N918 (continued)

TABLE 1: GROUP A INSPECTION ($T_A = 25^\circ\text{C} \pm 3^\circ\text{C}$ unless otherwise noted) (continued)

Examination or Test	Mil-Std-750 Method	Symbol	Limits		Unit	* LTPD
			Min	Max		
SUBGROUP 3						
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f \geq 0.1 \text{ MHz} \ \& \ \leq 1.0 \text{ MHz}$)	3238	C_{ob}			pF	10
All Types			-	1.7		
($V_{CB} = 0$, $I_E = 0$, $f \geq 0.1 \text{ MHz} \ \& \ \leq 1.0 \text{ MHz}$)			-	3.0		
All Types						
Input Capacitance ($V_{EB} = 0.5 \text{ Vdc}$, $I_C = 0$, $f \geq 0.1 \text{ MHz} \ \& \ \leq 1.0 \text{ MHz}$)	3240	C_{ib}			pF	
All Types	(Note 1)		-	2.0		
SUBGROUP 4						
Small-Signal Current Gain ($V_{CE} = 10 \text{ Vdc}$, $I_C = 4.0 \text{ mA dc}$, $f = 100 \text{ MHz}$)	3308	$ h_{fe} $			-	10
All Types			6.0	-		
Small-Signal Amplifier Gain ($V_{CC} = 12 \text{ Vdc}$, $I_C = 6.0 \text{ mA dc}$, $f = 200 \text{ MHz}$)	(Figure 2)	G_{pe}			dB	
All Types			15	-		
Collector-Base Time Constant ($V_{CB} = 10 \text{ Vdc}$, $I_E = -4.0 \text{ mA dc}$, $f = 79.8 \text{ MHz}$)		$r_b' C_c$			ps	
JAN2N918			-	25		
Noise Figure ($V_{CE} = 6.0 \text{ Vdc}$, $I_C = 1.0 \text{ mA dc}$, $R_G = 400 \text{ ohms}$, $f = 60 \text{ MHz}$)	(Note 2)	NF			dB	
All Types			-	6.0		
Oscillator Power Output ($V_{CB} = 15 \text{ Vdc}$, $I_C = 8.0 \text{ mA dc}$, $f = 500 \text{ MHz}$)	(Note 3)	P_{out}			mW	
All Types			30	-		
Collector-Efficiency Test ($V_{CB} = 15 \text{ Vdc}$, $I_C = 8.0 \text{ mA dc}$, $f = 500 \text{ MHz}$)	(Note 3)	η			%	
All Types			25	-		
SUBGROUP 5 (Note 4)						
(Note 4)						
High Temperature Operation						
Collector-Base Cutoff Current ($V_{CB} = 15 \text{ Vdc}$, $I_E = 0$, $T_A = 150^\circ\text{C}$)	3038	I_{CBO}			$\mu\text{A dc}$	
All Types	Condition D		-	1.0		
Low Temperature Operation						
DC Current Gain ($V_{CE} = 1.0 \text{ Vdc}$, $I_C = 3.0 \text{ mA dc}$, $T_A = -55^\circ\text{C}$)	3076	h_{FE}			-	
JAN2N918	(Note 4)		10	-		

*Applies to Meg A Life II and Mil Units Only

†Minimum value only applies to Standard Unit

NOTES:

- This test shall be in accordance with Method 3240 of MIL-STD-750 except that the output capacitor is omitted.
- Noise Figure shall be measured using a HP 342A NF Meter in accordance with HP 342A pertinent test procedure or by use of a suitable equivalent test-equipment circuit and procedure.
- Sample units shall be allowed to return to and be stabilized at room ambient temperature prior to being subjected to the Low-Temperature Operation test.
- Test Measurement shall be made after thermal equilibrium has been reached at the temperature specified.
- All applicable end-point test measurements shall be made within four hours after the particular sample units have been subjected to the required physical-mechanical or environmental test(s). This requirement is not applicable to measurements specified to be made during (subjection of sample units) a physical-mechanical or environmental test, and shall not be applicable where otherwise specified for life test(s).
- There shall be no evidence of flaking, pitting, or other visible signs of corrosion on sample units, upon examination without magnifications, after subjection to test.
- Per MIL-STD-202, Method 112, Test Condition C, Procedure 111a and Test Condition A for Gross Leaks.

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TABLE II : GROUP B INSPECTION

(Fourth lead is "floating" unless otherwise specified.)

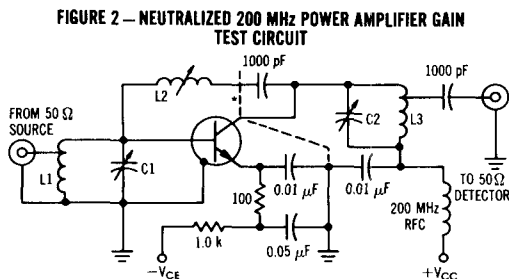
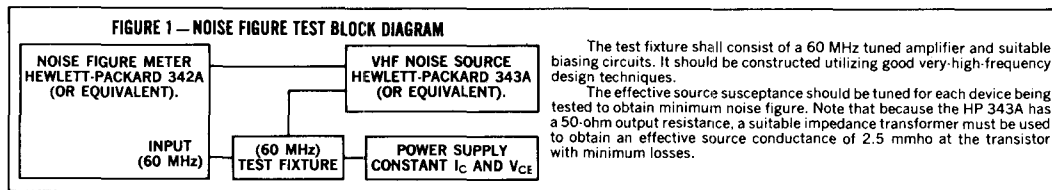
Examination or Test	Mil-Std-750 Method	Symbol	Limits		Unit	LTPD
			Min	Max		
SUBGROUP 1						
Physical Dimensions	2066	-	-	-	-	20
SUBGROUP 2						
Solderability	2026	-	-	-	-	10
Temperature Cycling	1051	-	-	-	-	
Thermal Shock (Glass Strain)	Condition C	-	-	-	-	
Seal (Leak Rate)	1056	-	-	-	-	
Moisture Resistance (No Initial Conditioning)	Condition A	-	-	-	-	
End-Point Tests: (Note 5)	(Note 7)	-	-	-	-	
Collector-Base Cutoff Current ($V_{CB} = 15 \text{ Vdc}$, $I_E = 0$)	1021	-	-	-	-	10
DC Current Gain ($I_C = 3.0 \text{ mAdc}$, $V_{CE} = 1.0 \text{ Vdc}$)	3036	I_{CBO}	-	10	nAdc	
	Condition D	-	-	-	-	
	3076	h_{FE}	20	200	-	
SUBGROUP 3						
Shock (1500 G, 0.5 ms, 5 blows each, Orientations X_1, Y_1, Y_2, Z_1 ; Total = 20 blows)	2016	-	-	-	-	10
Vibration, Variable Frequency	Non-operating	-	-	-	-	
Vibration Fatigue (20 G)	2056	-	-	-	-	
Constant Acceleration (Centrifuge) (20,000 G, Orientations X_1, Y_1, Y_2, Z_1)	2046	-	-	-	-	
End-Point Tests: Same as Subgroup 2 (Note 5)	Non-operating	-	-	-	-	
	2006	-	-	-	-	
SUBGROUP 4						
Lead Fatigue	2036	-	-	-	-	15
End-Point Tests: Seal (Notes 5 and 7)	Condition E	-	-	-	-	
			-	5×10^{-7}	atm cm ³ /s	
SUBGROUP 5						
Salt Atmosphere (Corrosion) (Note 6)	1041	-	-	-	-	20
End-Point Tests: Same as Subgroup 2						
SUBGROUP 6						
High Temperature Life (Non-Operating) ($T_{stg} = +200^\circ\text{C}$, min)	1031	-	-	-	-	$\lambda = 15$
End-Point Tests: (Note 5)	Non-operating	-	-	-	-	
Collector-Base Cutoff Current ($V_{CB} = 15 \text{ Vdc}$, $I_E = 0$)	3036	I_{CBO}	-	20	nAdc	
DC Current Gain ($I_C = 3.0 \text{ mAdc}$, $V_{CE} = 1.0 \text{ Vdc}$)	Condition D	-	-	-	-	
	3076	h_{FE}		$\pm 25\%$ of Group A Limits	-	
SUBGROUP 7						
Steady State Operation Life ($P_T = 200 \text{ mW}$, $I_C = 20 \text{ mAdc}$, $T_A = 25^\circ\text{C} \pm 3^\circ\text{C}$)	1026	-	-	-	-	$\lambda = 15$
End-Point Tests: (Note 5) Same as Subgroup 6						

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TABLE III: CONDITIONING and SCREENING

Procedure	Symbol	Mil-Std-750 Method	Conditions	Limits
BURN-IN at rated Power for 96 hours	—	—	$V_{CE} = 10 \text{ Vdc}$, $T_A = 25^\circ\text{C}$	—
ELECTRICAL SCREENS After Burn-In DC Current Gain Changes in h_{FE} before and after Burn-In, measured at stated conditions.	Δh_{FE}	3076	$I_C = 3.0 \text{ mA}$, $V_{CE} = 1.0 \text{ Vdc}$, Pulsed*	+20% Within Group A Limits
Collector-Base Cutoff Current	I_{CBO}	3036 Condition D	$V_{CB} = 15 \text{ Vdc}$	} Group A Limits
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	3071	$I_C = 10 \text{ mA}$, $I_B = 1.0 \text{ mA}$, Pulsed*	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	3066 Condition A	$I_C = 10 \text{ mA}$, $I_B = 1.0 \text{ mA}$, Pulsed*	

* Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$



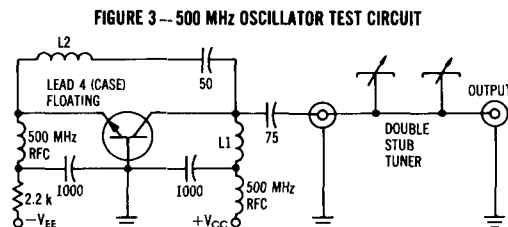
NEUTRALIZATION PROCEDURE:

- Connect 200 MHz signal generator (with 50 ohm output impedance) to input terminals of amplifier, and connect 50 ohm RF voltmeter to output terminals of amplifier.
- Apply V_{EE} and V_{CC} to obtain specified test conditions.
- Adjust output of signal generator to approximately 10 millivolts and tune C1 and C2 for maximum output.
- Interchange connections to signal generator and RF voltmeter and with sufficient signal applied at output terminals, tune L2 for minimum indication on RF-voltmeter.
- Repeat this sequence until optimum settings are obtained for all variables.

CIRCUIT COMPONENT INFORMATION:

- | | |
|--|--|
| C1: 3-12 pF | L2: 0.4-0.65 μH Miller #4303 (or equal) |
| C2: 1.5-7.5 pF | L3: 8 turns #16 AWG 1/8" ID, 7/8" length, turns ratio — 2 to 1 |
| L1: 3 1/2 turns #16 AWG 5/16" ID, 7/16" length, turns ratio — 2 to 1 | |

*External interlead shield to isolate collector lead from emitter and base leads.



OSCILLATOR ADJUSTMENT PROCEDURE:

Measurements of P_{out} shall be made in this circuit or a suitable equivalent. The circuit adjustment procedure is as follows:

- Set V_{CC} and V_{EE} to obtain specified test conditions.
- Adjust stub tuner to obtain maximum output at specified frequency of oscillation.
- Check I_C and reset if necessary.
- Read P_{out} .

Note: Collector efficiency (η), may be determined as follows:

$$\eta \text{ in } \% = \frac{P_{out}}{120} \times 100$$

Where P_{out} is in milliwatts.

CIRCUIT COMPONENT INFORMATION:

- | | |
|--|---|
| L1: 2 turns #16 AWG, 3/8" OD, 1 1/4" length | 2 GR Type 874 TEE |
| L2: 9 turns #22 AWG, 3/16" OD, 1 1/2" length | 1 GR Type 874-D20 Adjustable Stub |
| Capacitance values are in pF. | 1 GR Type 874-LA Adjustable Line |
| Double Stub Tuner consists of the following commercially available components. | 1 GR Type 874-WN3 Short-Circuit Termination |
- (or equivalents)