

MILITARY SPECIFICATION

SEMICONDUCTOR DEVICE, FIELD EFFECT  
TRANSISTORS, N-CHANNEL, SILICON  
TYPES 2N6764, 2N6766, 2N6768, 2N6770,  
JANTX, JANTXV, AND JANS

This amendment forms a part of MIL-S-19500/543C, dated 8 September 1987, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 1

Upper left hand corner, implementation date, third line: Delete "8 September 1988" and substitute "8 May 1989".

PAGE 4

4.3, Screen 12, JANS column: Delete "test condition A and C (see 4.3.1)" and substitute "test condition A; (see 4.3.1) condition C shall precede condition A".

PAGE 5

4.3.1, second line: Delete "-0" and substitute "-5°C".

4.5.3, delete the main text only and substitute the following:

"The delta  $V_{SD}$  measurements shall be performed in accordance with method 3161 of MIL-STD-750. The delta  $V_{SD}$  conditions ( $I_H$  and  $V_H$ ) and maximum  $V_{SD}$  limit shall be derived by each vendor from the thermal response curves (see figure 2). The chosen  $\Delta V_{SD}$  measurement and conditions for each device in the qualification lot shall be submitted in the qualification report. The chosen  $\Delta V_{SD}$  shall be considered final after the manufacturer has had the opportunity to test five consecutive lots."

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TABLE I, Subgroup 2, Forward transconductance, Conditions column: Delete "Pulsed (see 4.5.1)" and substitute " $I_D = \text{Rated } I_{D2}$  (see 1.3), pulsed (see 4.5.1)".

TABLE I, Subgroup 2, Forward transconductance: Move entire inspection to last place in subgroup 2.

TABLE I, Subgroup 2, Gate current, Conditions column: Delete " $V_{GS} = \pm 20 \text{ V dc}$ " and substitute " $V_{GS} = +20$  and  $-20 \text{ V dc}$ ".

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TABLE I, Subgroup 3, Gate current, Conditions column: Delete " $V_{GS} = \pm 20 \text{ V dc}$ " and substitute " $V_{GS} = +20 \text{ V}$  and  $-20 \text{ V dc}$ ".

TABLE I, Subgroup 4, delete in its entirety and substitute the following:

Inspection	Method	MIL-STD-750	LTPD 1/		Symbol	Limits		Unit
		Conditions	JANS	JANTX, JANTXV		Min	Max	
<b>Subgroup 4</b>								
Switching time test	3472	I <sub>D</sub> = Rated I <sub>D2</sub> (see 1.3) V <sub>GS</sub> = 10 V dc Gate drive impedance = 2.35Ω						
Turn-on delay time					t <sub>d(ON)</sub>			
2N6764		V <sub>DD</sub> = 24 V dc				---	35	ns
2N6766		V <sub>DD</sub> = 95 V dc				---	35	ns
2N6768		V <sub>DD</sub> = 180 V dc				---	35	ns
2N6770		V <sub>DD</sub> = 210 V dc				---	35	ns
Rise time					t <sub>r</sub>			
2N6764		V <sub>DD</sub> = 24 V dc				---	100	ns
2N6766		V <sub>DD</sub> = 95 V dc				---	100	ns
2N6768		V <sub>DD</sub> = 180 V dc				---	65	ns
2N6770		V <sub>DD</sub> = 210 V dc				---	50	ns
Turn-off delay time					t <sub>d(OFF)</sub>			
2N6764		V <sub>DD</sub> = 24 V dc				---	125	ns
2N6766		V <sub>DD</sub> = 95 V dc				---	125	ns
2N6768		V <sub>DD</sub> = 180 V dc				---	150	ns
2N6770		V <sub>DD</sub> = 210 V dc				---	150	ns
Fall time					t <sub>f</sub>			
2N6764		V <sub>DD</sub> = 24 V dc				---	100	ns
2N6766		V <sub>DD</sub> = 95 V dc				---	100	ns
2N6768		V <sub>DD</sub> = 180 V dc				---	75	ns
2N6770		V <sub>DD</sub> = 210 V dc				---	70	ns

TABLE I, Subgroup 5, delete entire subgroup and substitute the following:

Inspection	Method	MIL-STD-750	LTPD 1/		Symbol	Limits		Unit
		Conditions	JANS	JANTX, JANTXV		Min	Max	
<b>Subgroup 5</b>								
Safe operating area test	3474	See figure 3, V <sub>DS</sub> = 80% of rated V <sub>DS</sub> and V <sub>DS</sub> ≤ 20 V maximum						
High voltage dc SOA		t <sub>p</sub> = 1 s						
Electrical measurements		See table IV, steps 1, 2, 3, 4, 5, 6, and 7						

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TABLE I, Subgroup 7, Test 1, Minimum off-state gate charge, 2N6768 and 2N6770, Min limits column: Delete "4.0" and substitute "3.0" (two places).

TABLE I, Subgroup 7, Test 2, On-state gate charge, Max limits column: Delete "119", "118", "120", "124" and substitute "125", "125", "125", "135".

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TABLE I, Subgroup 7, Test 6, Gate to drain charge, Max limits column: Delete "64", "65", "56", "61" and substitute "75", "75", "75", "80".

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TABLE IIa, Subgroup 4, Intermittent operation life, Conditions column: Delete ", see 4.3.1".

TABLE IIa, Subgroup 5, Accelerated steady-state operation life, Conditions column: Delete " $T_J = 200^\circ\text{C}$ " and substitute "(except)  $T_J = 200^\circ\text{C} +20^\circ\text{C}, -0^\circ\text{C}$ ".

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TABLE IIb, Subgroup 3, Intermittent operation life (LTPD), Conditions column: Delete "A" and substitute "The heating".

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TABLE III, Subgroup 2: Delete "Visual and mechanical evaluation" and method "2071".

TABLE III, Subgroup 6, Intermittent operation life (LTPD), Conditions column: Delete "A" and substitute "The heating".

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TABLE IV, Step 3, Gate current, Condition column: Delete " $V_{GS} = \pm 20\text{ V dc}$ " and substitute " $V_{GS} = +20$  and  $-20\text{ V dc}$ ".

TABLE IV, footnote 1/: Delete in its entirety.

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FIGURE 2: Delete ".050" and substitute "Single pulse". Also, NOTE 2: Delete " $R_{\theta JC} = 1.0$ " and substitute " $R_{\theta JC} = .83$ ".

CONCLUDING MATERIAL

Custodians:

Army - ER  
Navy - EC  
Air Force - 17  
NASA - NA

Review activities:

Air Force - 11, 17, 80  
DLA - ES  
NASA - EG13

User activity:

Air Force - 19

Preparing activity:

Air Force - 17

Agent:

DLA - ES

(Project 5961-1068)