Modification of F38 and Characteristic IV curve of 2SK30ATM

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REVISION:

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SUMMARY

F38 modified to meet the change of JPL's LNA. The modifications of channel 1 as:

1. R26 and R27 to 230K, replaced of 270K. To have higher gate voltage.
2. R53 changed to 12 ohm, instead of 27. To have high current, up to 30mA.
3. D2 limiting diode removed. To relax +0.6 gate limiting voltage.
4. REF1 limiting diode removed. Relax the -1.2V limit gate voltage.
5. JP2 installed, to have larger Vds voltages.
6. JP4 removed, to relax the limiting drain to gate voltage from 2.0 to 5.8V.

The modifications of channel 2 as:

1. R31 and R32 to 230K, replaced of 270K. To have higher gate voltage.
2. R67 changed to 12 ohm, instead of 27. To have high current, up to 30mA.
3. D8 limiting diode removed. To relax +0.6 gate limiting voltage.
4. REF2 limiting diode removed. Relax the -1.2V limit gate voltage.
5. JP6 installed, to have larger Vds voltages.
6. JP8 removed, to relax the limiting drain to gate voltage from 2.0 to 5.8V.

The modifications of channel 3 as:

1. R36 and R37 to 230K, replaced of 270K. To have higher gate voltage.
2. R76 changed to 12 ohm, instead of 27. To have high current, up to 30mA.
3. D14 limiting diode removed. To relax +0.6 gate limiting voltage.
4. REF3 limiting diode removed. Relax the -1.2V limit gate voltage.
5. JP10 installed, to have larger Vds voltages.
6. JP12 removed, to relax the limiting drain to gate voltage from 2.0 to 5.8V.

The modifications of channel 4 as:
1. R41 and R42 to 230K, replaced of 270K. To have higher gate voltage.
2. R88 changed to 12 ohm, instead of 27. To have high current, up to 30mA.
3. D20 limiting diode removed. To relax +0.6 gate limiting voltage.
4. REF4 limiting diode removed. Relax the -1.2V limit gate voltage.
5. JP14 installed, to have larger Vds voltages.
6. JP16 removed, to relax the limiting drain to gate voltage from 2.0 to 5.8V.

Results shown that it can allow the gate voltage go up to 4.0V, and down to -2.0V. This is depend on the devices.

2SK30ATM, a regular FET, has performed the dummy LNA. Result plot as below, showing that the curve of drain current vs gate voltage is pretty close to the one shown on the datasheet.

![Characteristic IV curve of 2SK30A using F38 with modification](image)

REFERENCES
1. HEMT bias card F38 by Suzy Jackson, ATNF.
2. 2SK30ATM datasheet, TOSHIBA.