

Substitution of the MRF448 for the 2SC2652 in the IC-2KL

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The Toshiba 2SC2652 has been discontinued for some time, and is almost unobtainable. Fortunately, however, the MRF448 is a near cross. ([View](#) the MRF448 data sheet).

The MRF448's should be ordered as a matched quad from a supplier such as [RF Parts Inc.](#) After installing the replacement devices, you will need to [realign](#) the amplifier.

In Step 2 (Idle Current), using an oscilloscope having at least 100 MHz bandwidth, you should also check the RF output waveform for minimum crossover distortion after setting the idle current I_o to 200 mA for each of the two PA modules.

If you have access to a 2-tone generator and an RF spectrum analyser, I would recommend checking the 2-tone IMD3 at 500W PEP.

When using two non-harmonically-related tones, the 3rd-order products should be at least 30 dB below two tones of equal amplitude. . In an audio-frequency passband between 300 and 3000 Hz, for example, a value in the neighbourhood of 700 or 1100 Hz may be chosen for f_1 , and in the neighbourhood of 1700 or 2500 Hz for f_2 .

You can try carefully moving the idle-current bias setting back and forth, and adjusting for minimum IMD3. The optimum point for each of the two modules will fall between the point where crossover distortion just starts to increase and that where IMD3 just starts to degrade. The desired range is $150 \text{ mA} < I_o < 200 \text{ mA}$.

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