

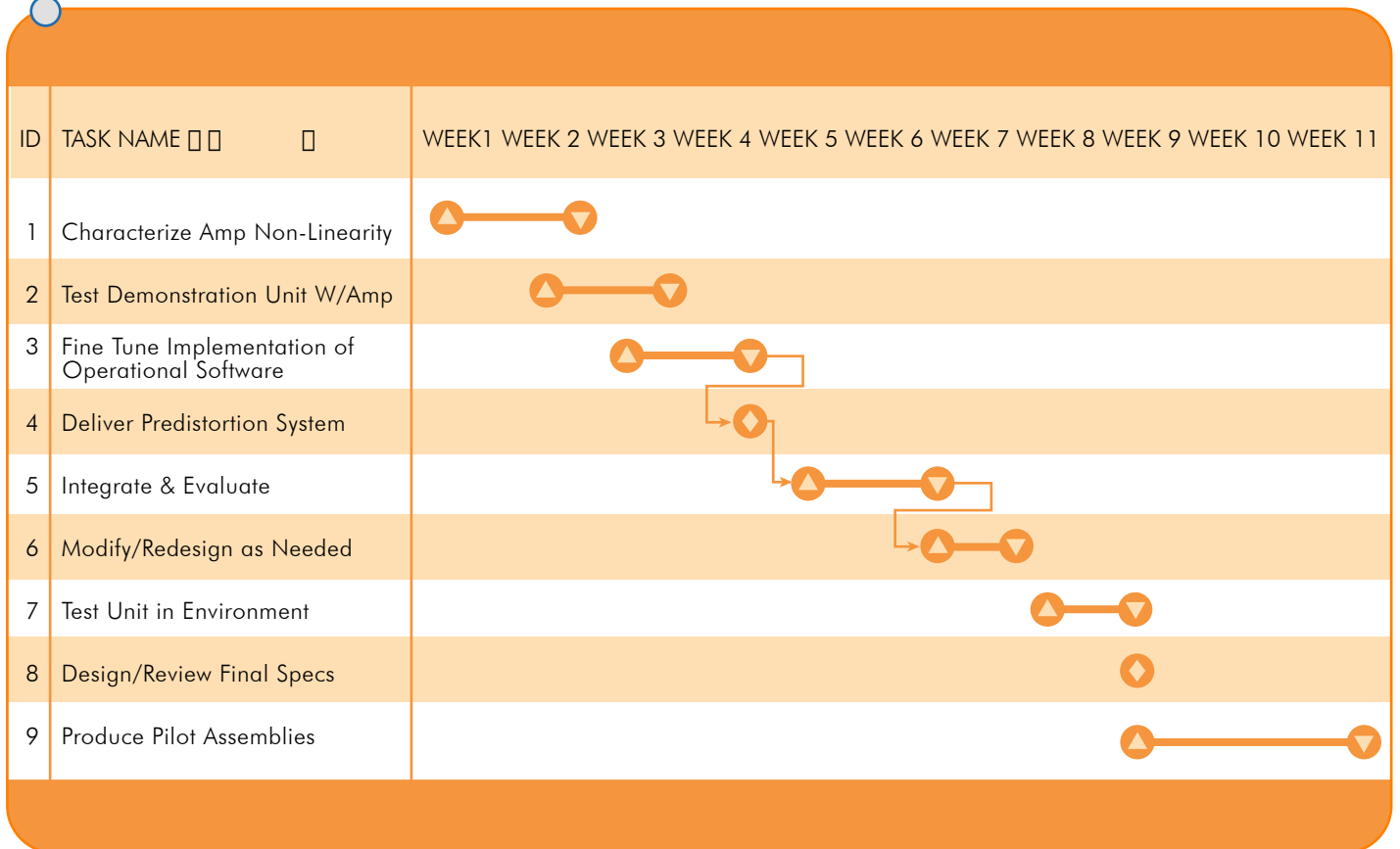
DIGITAL LINEARIZATION

Custom DSP Linearizer Modules

Reduce distortion products by 35 dB or more.
Up to a 500 MHz correction bandwidth.

- Available for VHF, UHF, Microwave & Millimeter Bands
- Applicable with all type of amplifiers: Bipolar, FET, TWTA, Klystron
- Class A, AB & B Applications
- 100% Support from Development Through Production

DSP PREDISTORTER PRODUCTION SCHEDULE



A versatile digital predistortion linearization system with much greater bandwidth (to 500 MHz) and performance (> 35 dB of distortion correction) has been developed. This system generates complex waveforms to compensate for the distortion of high power amplifiers (HPAs) and other system components. All signal generation and processing is done digitally. The use of digital processing for predistortion (PD) allows precise complex transfer characteristics to be more easily generated. It also allows greater flexibility in tailoring and modifying these responses.

Today's communications systems make use of complex modulation schemes in which the peak to average power ratio is high, producing a non-constant envelope. Amplifiers made for these modulations must be highly linear to minimize distortion that can affect adjacent channel signals and signal quality. To achieve the required level of linearity, amplifiers are often operated at a small fraction of their power capacity resulting in low efficiency, extra cost, weight, size, and heat generation. Sometimes all of these facts together make a communication system impractical, particularly for portable and power-consumption-sensitive applications. Many linearization techniques have been implemented. Almost all of these systems use analog technology. With the advent of very high-speed logic devices, digital signal processing is slowly replacing hard to tune and unstable analog circuits.

LTI's digital linearizer platform is a multi-purpose system that can be integrated into virtually all RF/microwave transmission systems without hardware changes. The system consists of a digital signal synthesizer, a PD linearizer, an upconverter (UPC), and ancillary equipment - see Figure 1. A standard Personal Computer (PC) can be used to upload the operating parameters to the system.

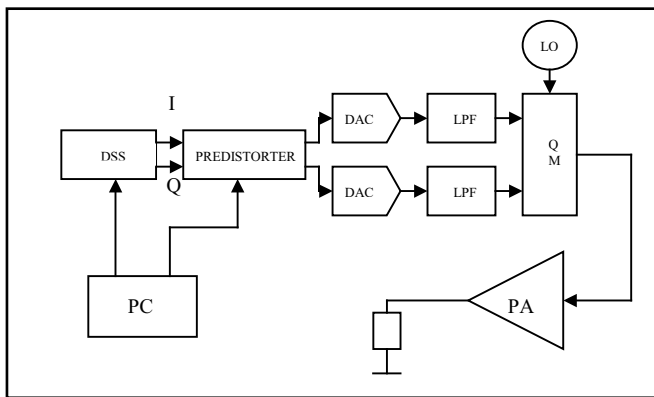


Figure 1. Digital signal synthesizer/predistortion linearizer configuration

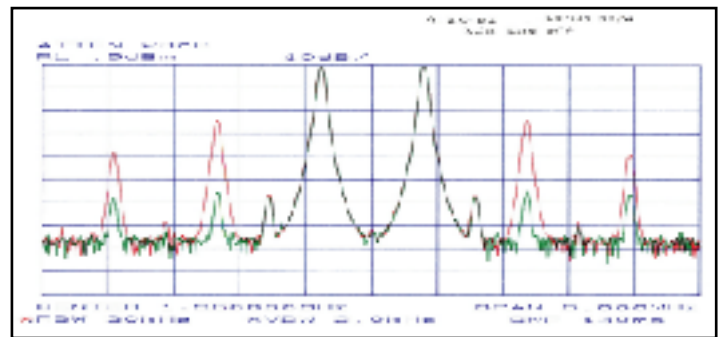


Figure 2. > 50 dB C/I at 3 dB from Saturation of LD MOS SSPA.

| FEATURES | ADVANTAGES | BENEFIT |
|--|---|--|
| Wider Bandwidth than existing digital solutions | Extends range of possible applications for digital applications | 5 –10 X advantage over digital techniques currently in use. |
| Flexibility | Can be tailored to a wide range of applications | Parameterized for virtually all custom applications. Competitive systems do not exist. |
| Intermodulation Distortion correction | Can achieve very high C/I | > 35 dB of reduction of IMD products |
| Incorporates Techniques for the correction of Memory Effects | Memory effects degrade Linearizers performance in many types of amplifiers. | 80% of HPAs have some form of degradation due to memory effects. |