ALSE RF IMMUNITY

A) MEASURE TOTAL CABLE LOSS

COUPLER THRU LOSS

CABLE LOSS

SMT-02 / SMT-03 SIGNAL GENERATOR

RF POWER AMPLIFIER

DUAL DIRECTIONAL COUPLER

IN

OUT

3

4

ALSE CHAMBER

1 FWD

REV **2**

5

$P_{meas, FWD}$

$P_{meas, REFL}$

CH1

CH2

$P_{ant, FWD}$

$P_{ant, NET}$

$P_{ant, REFL}$

BONTOON POWER METER

$$VSWR = \frac{1 + \sqrt{\dfrac{P_{rev}}{P_{fwd}}}}{1 - \sqrt{\dfrac{P_{rev}}{P_{fwd}}}}$$

$P_{meas, FWD}$ = Measured Forward Power
$P_{meas, REFL}$ = Measured Reflected Power
$P_{ant, FWD}$ = Forward Power at the Antenna
$P_{ant, REFL}$ = Reflected Power at the Antenna
$P_{ant, NET}$ = Net Power at the Antenna
$k_{VSWR, ant}$ = Voltage Standing Wave Ratio at the Antenna
$k_{VSWR, meas}$ = Voltage Standing Wave Ratio at the Coupler
A = Cable Loss between power Coupler and Antenna

1) FORWARD CABLE
2) REVERSE CABLE
3) OUTPUT CABLE
4) THRU CONNECTOR
5) ANTENNA CABLE

$$A = \frac{P_{ant,FWD}}{P_{meas,FWD}} \qquad P_{ant,NET} = \left(A \times P_{meas,FWD}\right) - \left(\frac{1}{A} \times P_{meas,REFL}\right)$$

$$\frac{P_{ant,NET}}{P_{meas,FWD}} = A - \frac{1}{A} \times \left(\frac{k_{VSWR,meas} - 1}{k_{VSWR,meas} + 1}\right)^2 \qquad \Delta P' = 10 \times \lg\left(\frac{P_{ant,NET}}{P_{meas,FWD}}\right)$$

$$\frac{P_{ant,REFL}}{P_{ant,FWD}} = \left(\frac{k_{VSWR,ant} - 1}{k_{VSWR,ant} + 1}\right)^2 \qquad \frac{P_{ant,NET}}{P_{ant,FWD}} = 1 - \left(\frac{k_{VSWR,ant} - 1}{k_{VSWR,ant} + 1}\right)^2$$

$$\Delta P = 10 \times \lg\left(\frac{P_{ant,NET}}{P_{ant,FWD}}\right)$$

Y $\Delta P'$ (dB)
X voltage standing wave ratio
If VSWR and cable loss are low $P_{ant,NET} = A \times P_{meas,FWD}$

SMT-02 / SMT-03 SIGNAL GENERATOR

DUAL DIRECTIONAL COUPLER

IN

OUT

B) DETERMINE FORWARD POWER METER CORRECTION FACTOR

1 FWD

REV **2**

3+4+5

CH1

CH2

50 Ω TERMINATOR

50 Ω LOAD

BONTOON POWER METER

Generate TILE calibration file for Forward Power (e.g. PM1)

SMT-02 / SMT-03 SIGNAL GENERATOR

DUAL DIRECTIONAL COUPLER

IN

OUT

C) DETERMINE REVERSE POWER METER CORRECTION FACTOR

1 FWD

REV **2**

3+4+5

CH1

CH2

50 Ω TERMINATOR

50 Ω LOAD

BONTOON POWER METER

Generate TILE calibration file for Reverse Power (e.g. PM2)

RF IMMUNITY TILE SOFTWARE
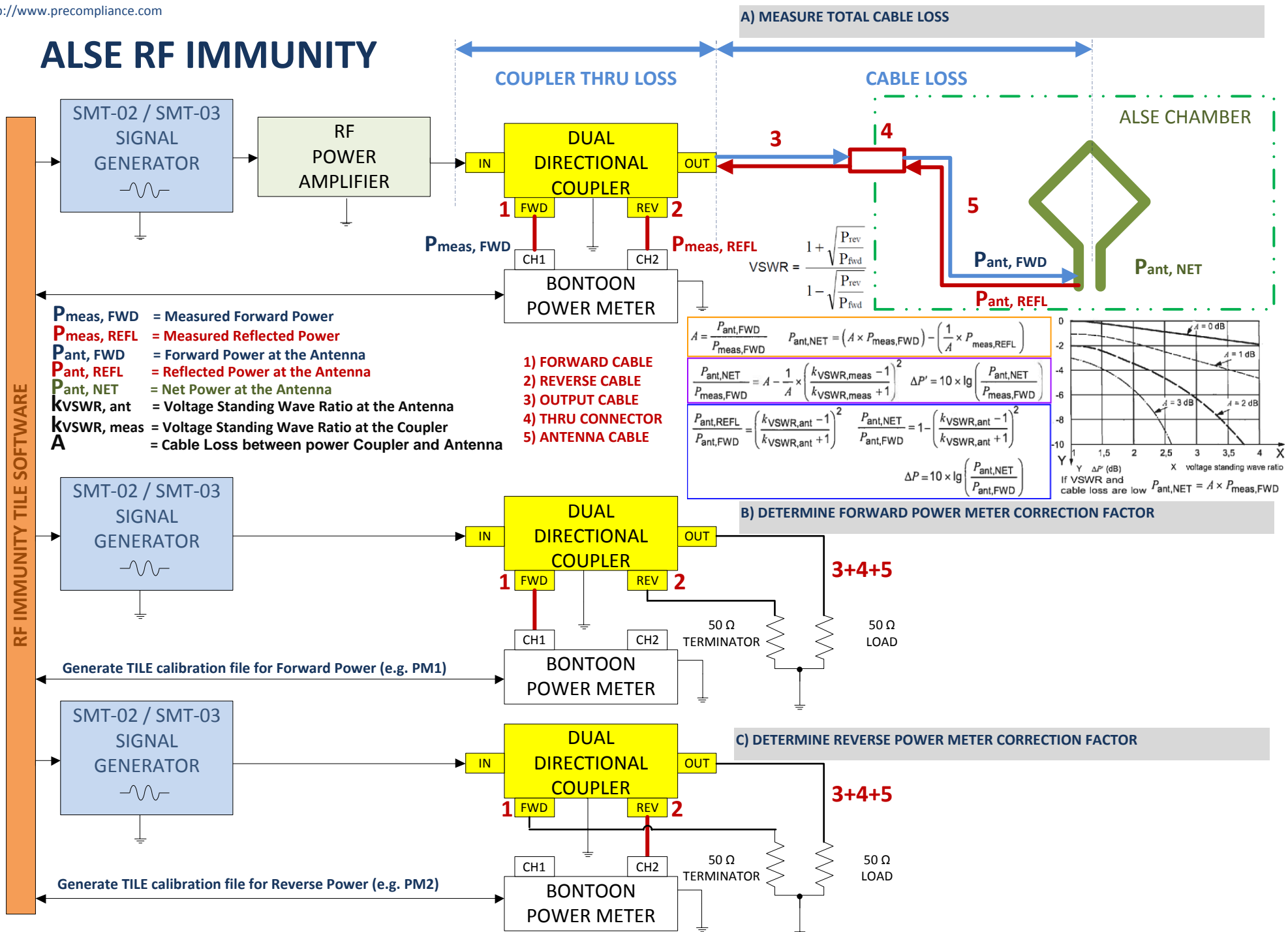
The above calibration procedure is required for all power meters and cables used to cover the entire test frequency range. Regardless to pulse modulation type used during the test, this calibration is done in CW (continuous wave). Tile software calibration files are to be used as part of ALSE RF Immunity filed calibration level (substitution method) procedure.