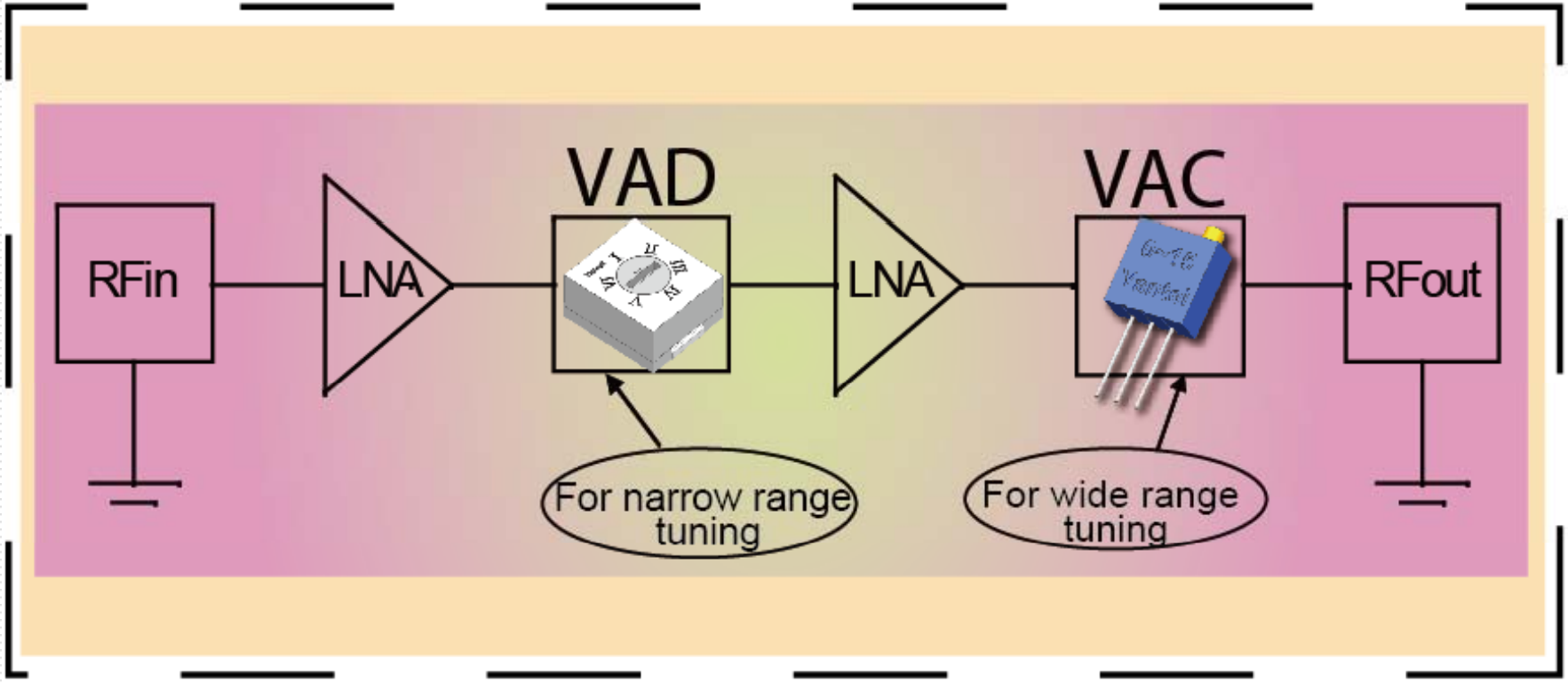
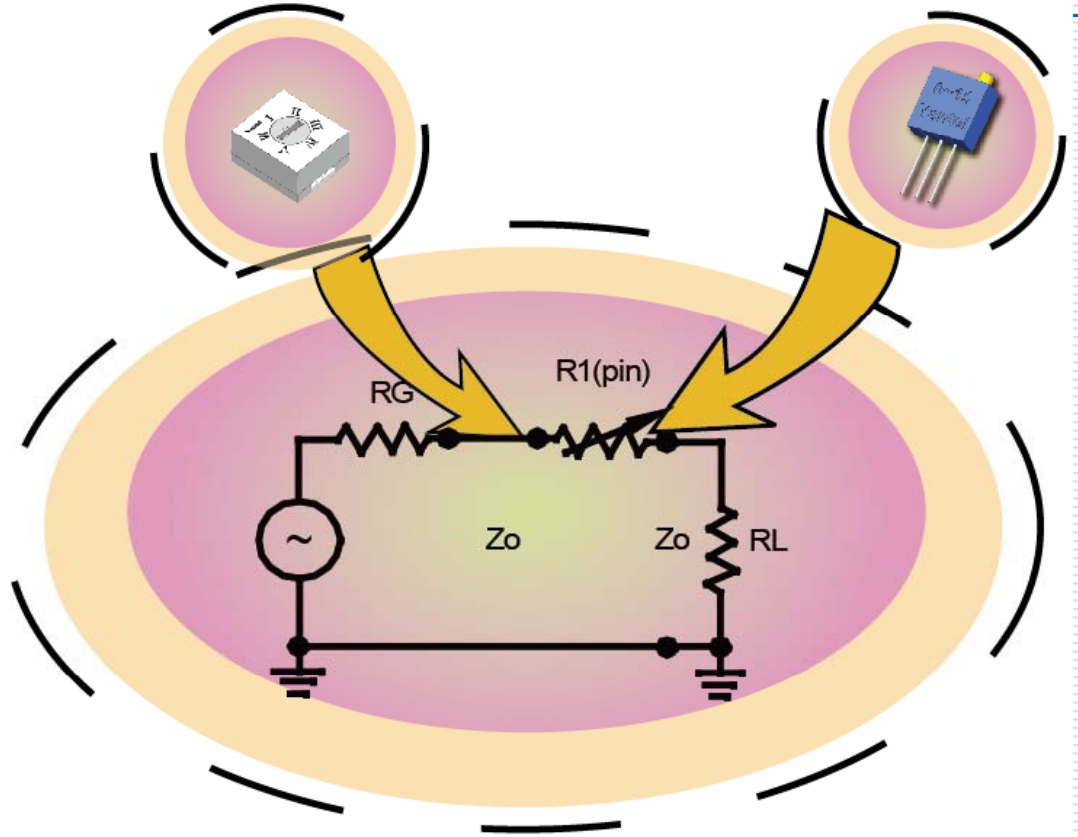
Application-1:in LNA&PA



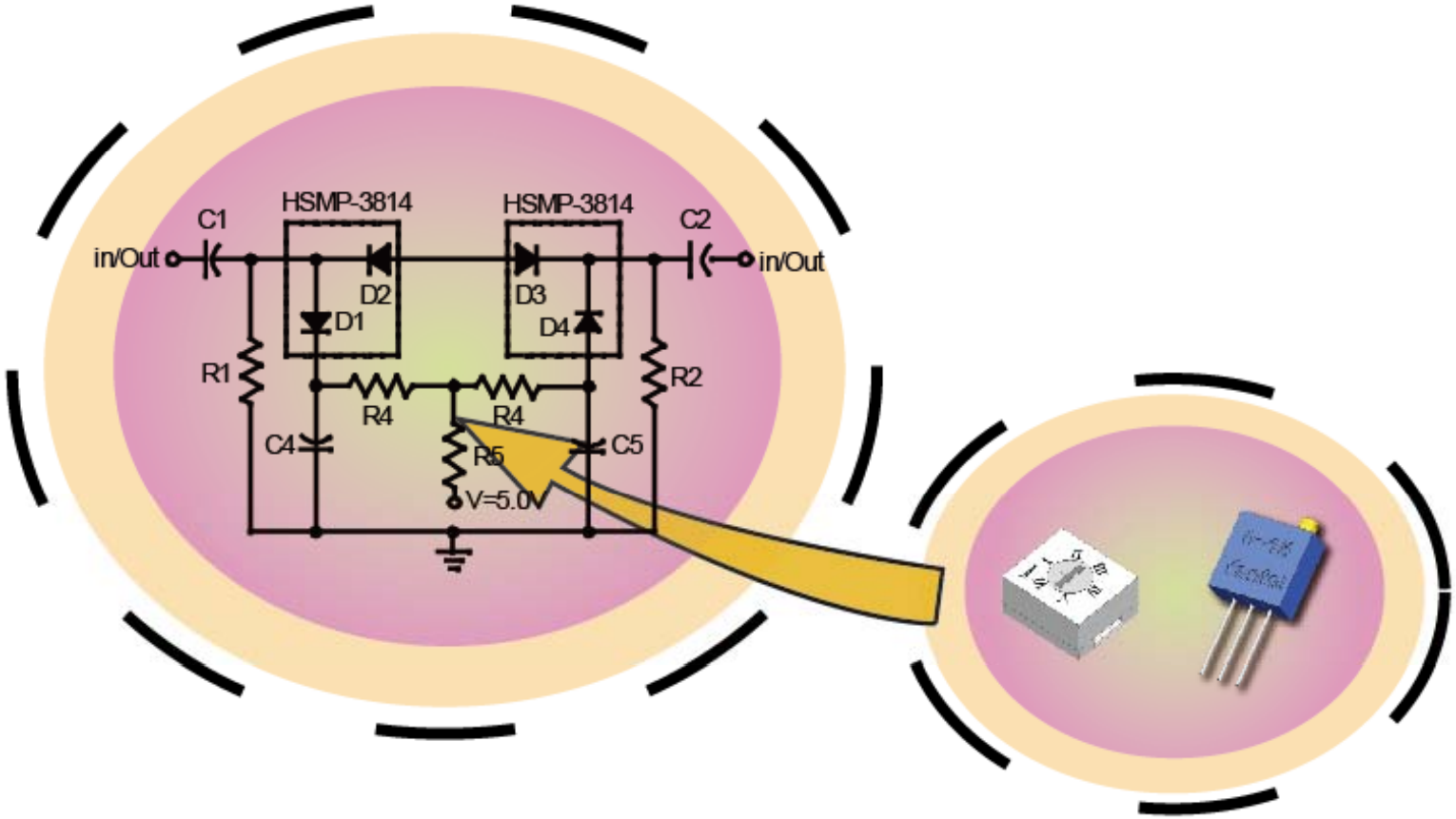
Advantage: Accurate gain tuning for RF signal , available in accurate adjustment of small attenuation for pre-stage amplifier and accurate adjustment of big attenuation for final amplifier.

Application-2: Replacing Variable Resistor



Advantage : Operating frequency DC-3GHz,
high accuracy of attenuation tuning

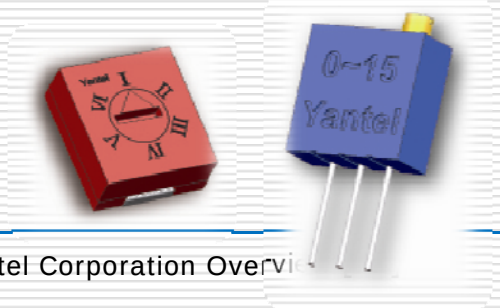
Application-3:Replacing Fixed Pi Attenuator



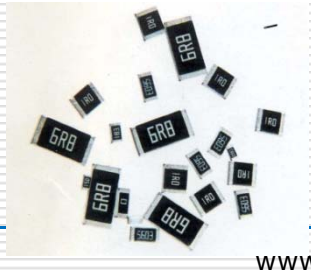
Advantage : Avoid repeated desolder and resolder of Pi attenuators (in adjusting attenuation values), minimize risk and optimize reliability.

Comparison

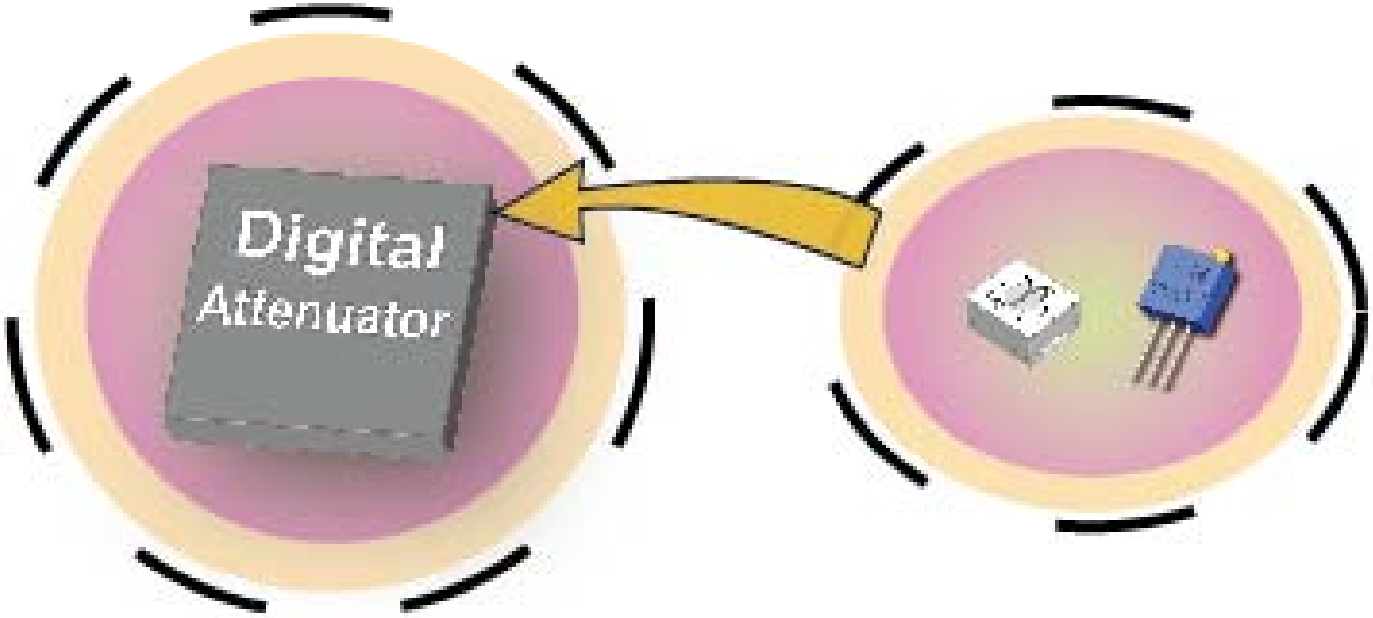
Yantel VAD/VAC VS Pi- Attenuator		
Items	**VAD/VAC**	**Pi- attenuator**
Patent	Patent granted in USA, China& other regions	No patent
Adjusting Method	Step & continuous available DC-3GHz	Not available in attenuation adjusting
Reliability	PCB mountable by reflow solder, high reliability and safe operation	The Pi attenuators have to be desoldered and resoldered , process of which decrease reliability of the system and device
Labor Cost	Attenuation can be adjusted directly on the PCB, minimize labor	Require manual labor to change, desolder and resolder the PI attenuator, consuming over 50% time and cost in the LNA/PA gain adjustment
Number of Component Used	1pcs	3pcs



Replace



Application-4: Replacing Digital Attenuator

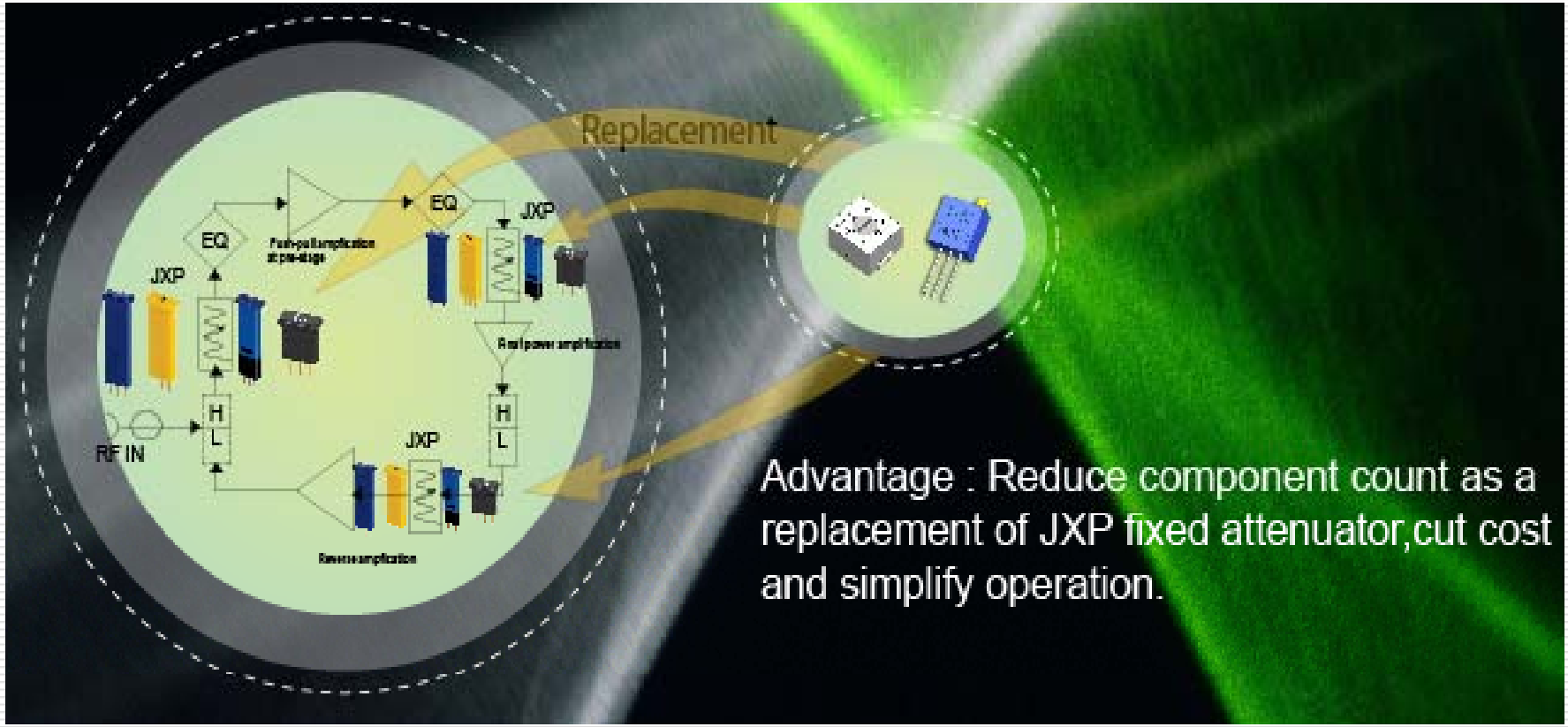


Advantage: Compared with digital attenuators, zero distortion, no extra IP3, lower noise, higher reliability.

Comparison

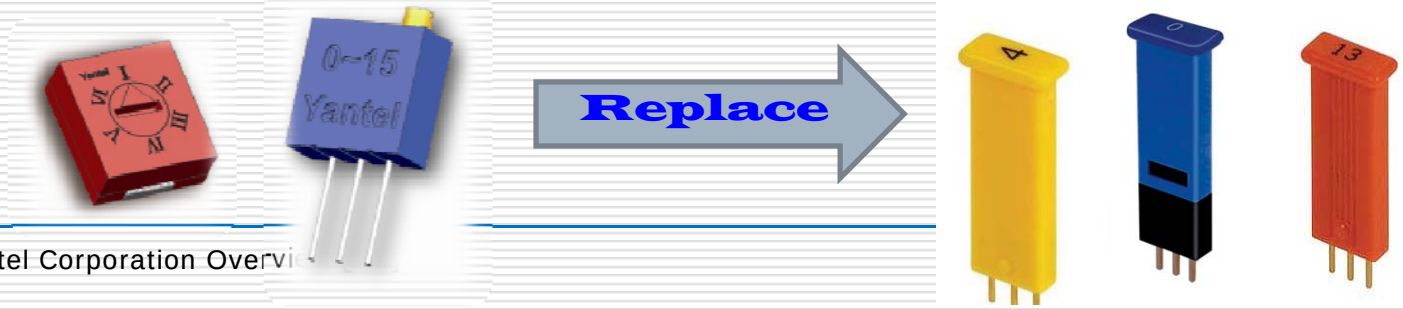
Yantel VAD/VAC VS Digital Attenuator		
Items	**VAD/VAC**	**Digital Attenuator**
Patent	Patent granted in China,USA&other regions	No patent
Linearity	zero distortion, no extra IP3, lower noise, higher reliability	Cause distortion, IP3& NF worsening. Can't work well at higher frequency than 2GHz, narrow operating freq range
Reliability	Passive component with high reliability	Lower reliability: consisting several active components, failure of a single device would cause failure to the system.
External signal control	Free from exteral power to control the signal	An external power needed to control the signal
System Cost	Low cost	Require extra MCU system and power,increasing cost for the overall solution
Labor cost	Minimized labor cost as the attenuation can be adjusted directly on the PCB	Require engineers to repeatedly set attenuation accuracy & variation in programming, time-consuming and complicated
Thermal characteristics	Long time work at +150℃ reliably	Operating temp limit to +80℃, performance worsen at higher temp.

Application 5: Replacing JXP Fixed Attenuator
（in CATV）

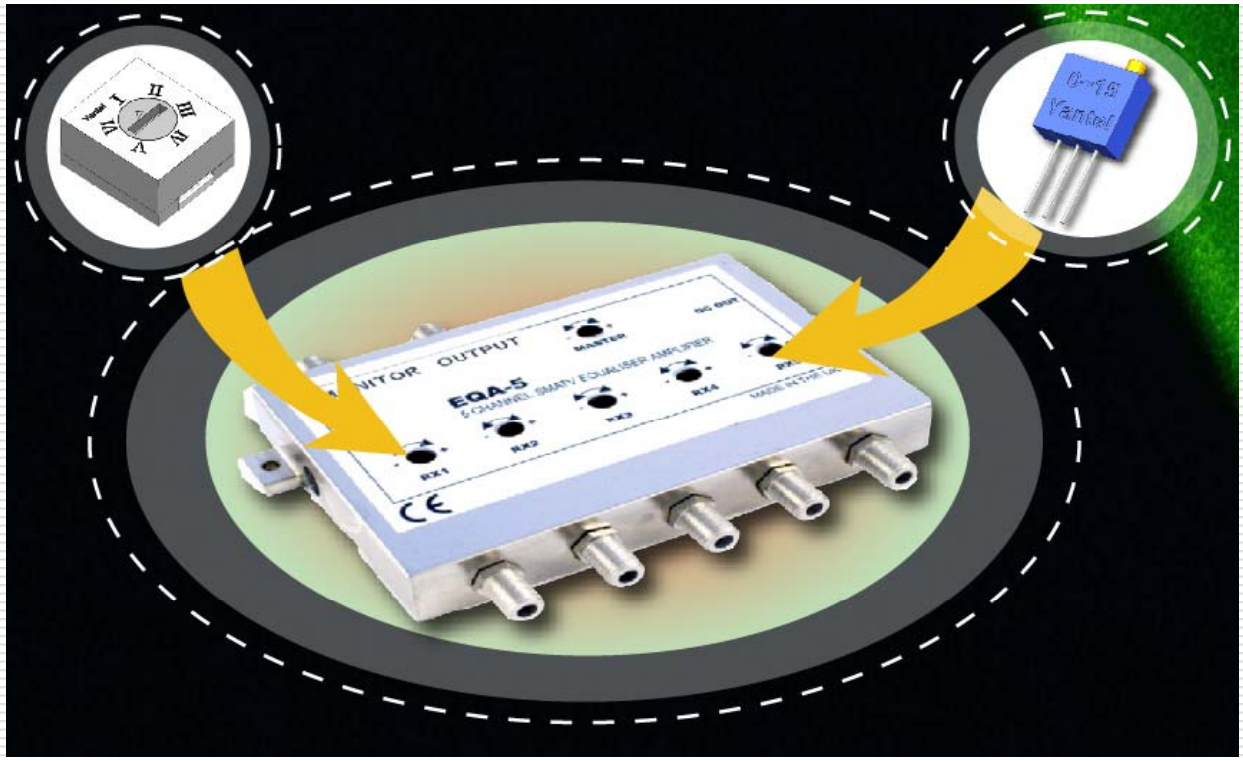


Comparison

Yantel VAD/VAC VS JXP Fixed Attenuator		
Items	**VAD/VAC**	**JXP fixed Attenuator**
Patent	Patent granted in USA, China& other regions	No patent
Adjusting Method	Step & continuous available (DC-3GHz)	Not easy in attenuation adjusting
Number of component	A single pcs	Multiple (3/4/5 or more pcs needed)
Reliability	PCB mountable by reflow solder, high reliability and safe operation	Plug in PCB, safety risk exist in operation
Labor cost	Minimize labor cost as the attenuation can be adjusted directly on the PCB, without having to “plug in” different attenuator values	Engineers have to try multiple pcs onsite before realizing the desired attenuation value
Solder	SMT via reflow solder, ideal for mass production	Plug in PCB



Application 6: Replacing Potentiometer(in CATV)



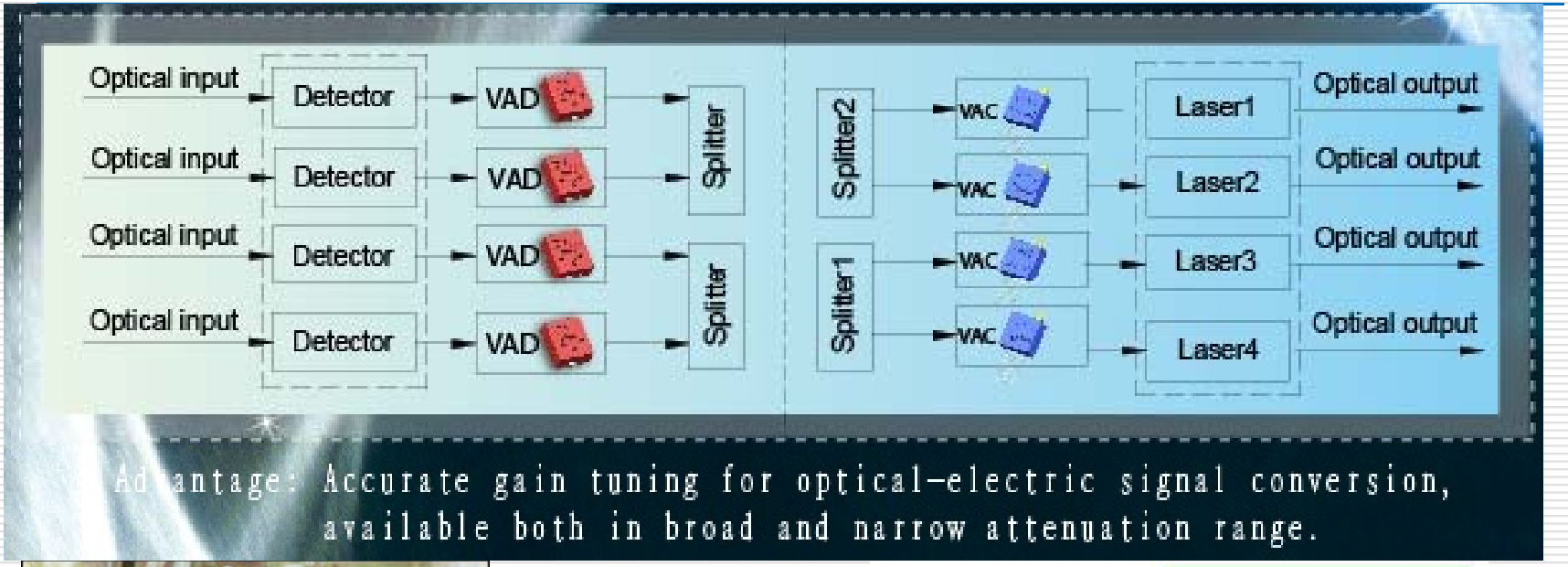
Advantage : Replacing variable potentiometer,
high level of accuracy from DC-3GHz,low VSWR,
low loss ,ideal for CATV application.

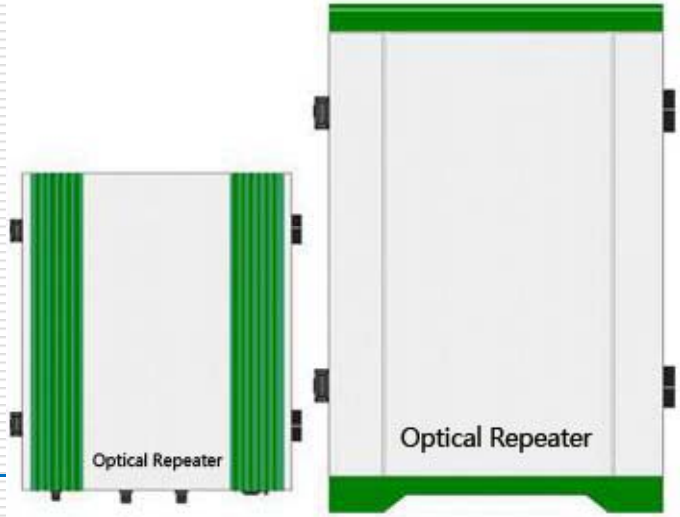
Comparison

Yantel VAD/VAC VS Variable Potentiometer		
Items	**VAD/VAC**	**Variable Potentiometer**
Patent	Patent granted in USA, China& other regions	No patent
Frequency	DC to 3GHz	Non-RF device, can not work in RF band
Accuracy	1dB (DC-2GHz)*	***±2.4dB(DC~2GHz)***
Insertion Loss	0.4dB(DC~2GHz)*	***2.4dB(DC~2GHz)***
VSWR	1.30(DC~2GHz)*	***2.46@2GHz***
Linearity	zero distortion, no extra IP3, lower noise, higher reliability	Cause distortion, IP3 worsening
Thermal characteristics	Long time work at +150℃ reliably	Operating temp limit to +80℃, performance worsen at higher temp.
Repeatability	Good repeatability	Big inconsistency in RF performance between lots
Effect on the PA	With low VSWR and IL, minimize PA heat generating	High IL reduces power efficiency, causing excessive heat to PA.
Solder	Capable of reflow solder(lead free) peak temp at 255℃	For wave solder only

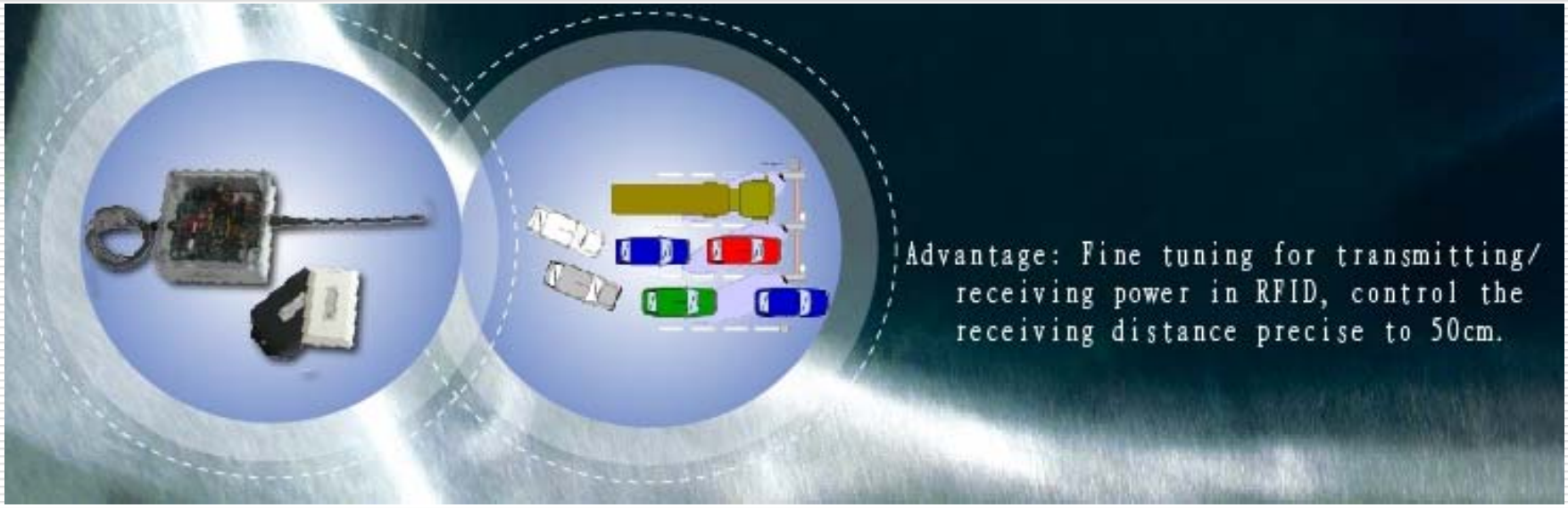
* Data from VAD0510

Application 7 :Optical Repeater





Application 8: 2.4GHz RFID



RFID for Parking Access Control

RFID for Retail Anti -Theft