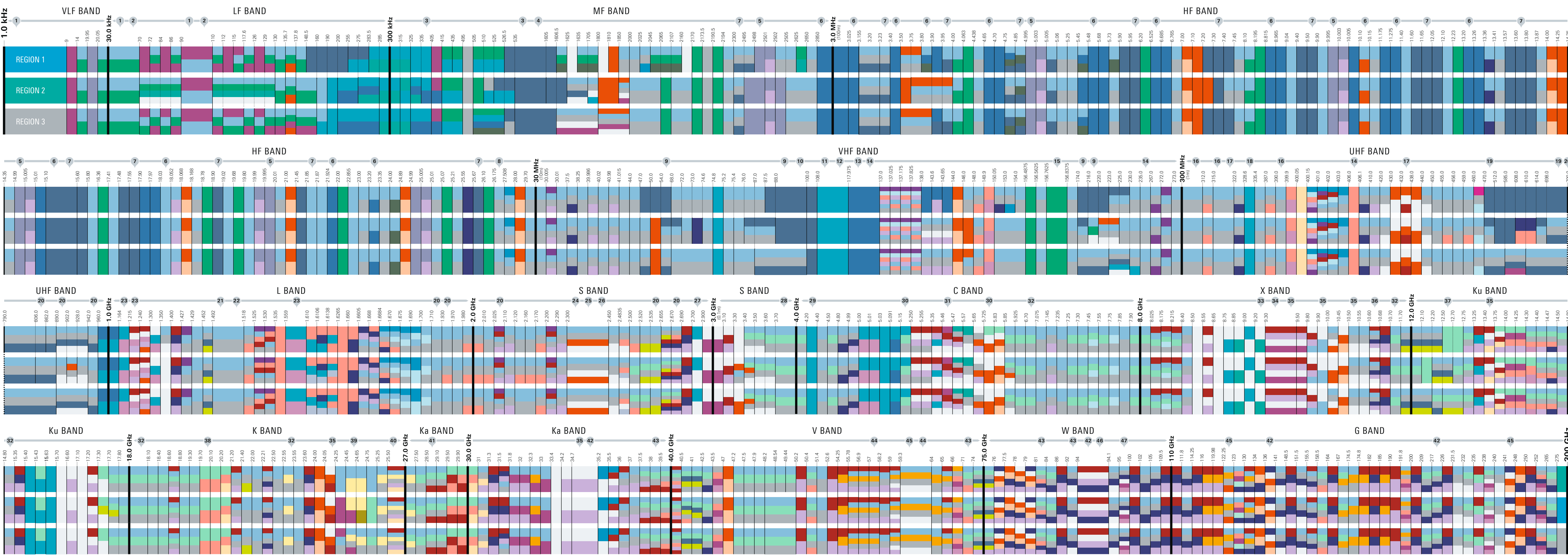
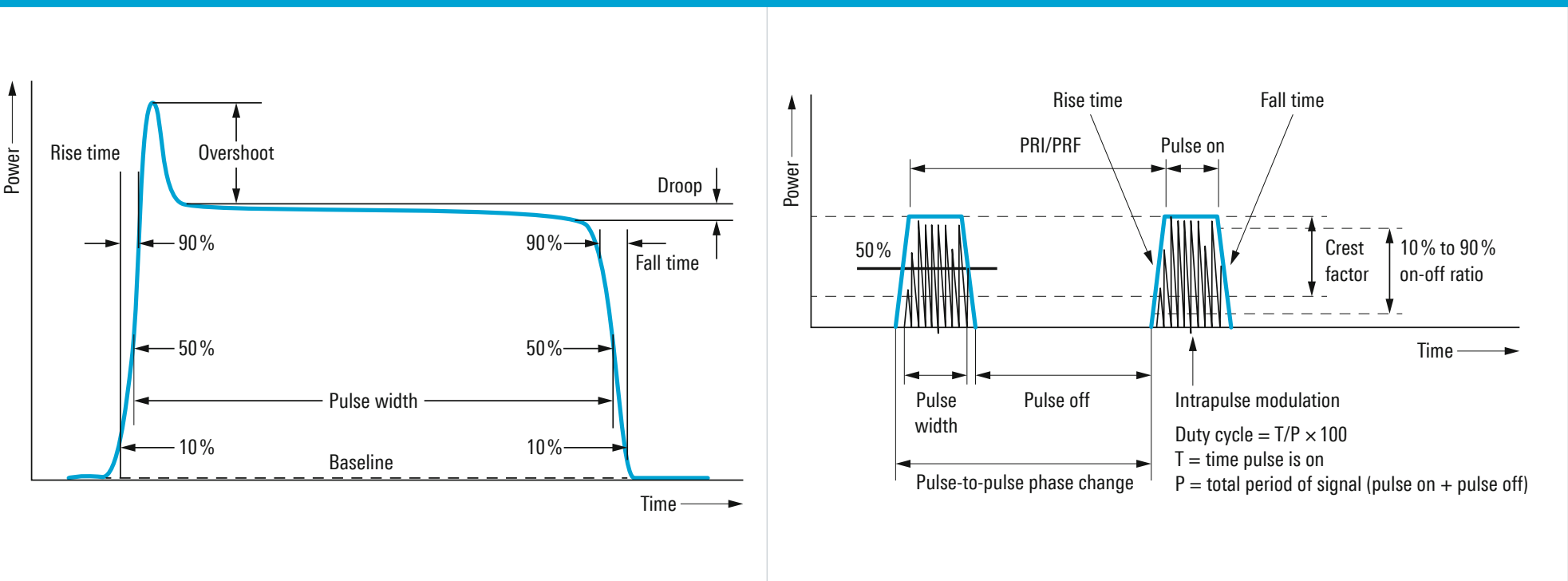


Spectrum allocation



- 1 Underground Cable Locating Equipment
- 2 Power Line Communications
- 3 ADF Non-Directional Beacons (NDB)
- 4 AM Radio Broadcast
- 5 WWV Time Standard Signals
- 6 Major World Air Route Areas (MWARA)
- 7 International Shortwave Broadcasters
- 8 Citizen Band Radios (CB)
- 9 VHF Television (TV)
- 10 FM Radio Broadcast
- 11 VHF Omni-Directional Range (VOR)
- 12 Instrument Landing System (ILS – LOC)
- 13 Civil Aircraft Communications Radio
- 14 Emergency Position-Indicating Radio Beacon (EPIRB)
- 15 International Maritime Channels
- 16 Garage Door Openers
- 17 Automobile Remote Keyless Entry (RKE)
- 18 Aircraft Landing Glide Slope (GS)
- 19 UHF Television (TV)
- 20 Cellular Phone Bands
- 21 Distance Measurement Equipment (DME)
- 22 Aircraft ATC Radar Transponders (Mode S)
- 23 Global Navigation Satellite Systems (L5, L2, L1)
- 24 Broadcast Satellite Radio Services
- 25 Wireless Local Area Networks 802.11b & g
- 26 Bluetooth Personal Area Networks (PAN)
- 27 ATC Surveillance Radar
- 28 Satellite Television Broadcast
- 29 Aircraft Radar Altimeters
- 30 Wireless Local Area Networks (WLAN) 802.11a
- 31 Weather Radar – Large Aircraft
- 32 Point-to-Point Telecomm Infrastructure
- 33 Weather Radar – Small Aircraft
- 34 Maritime Radar
- 35 Police Radar Speed Measurement
- 36 Radar Motion Detectors (Doors & Alarms)
- 37 Direct Broadcast Satellite
- 38 Fixed Satellite Service Space-to-Earth All Regions
- 39 Inter-Satellite Radiolocation
- 40 Inter-Satellite Frequency & Time Standard Reference
- 41 Fixed Satellite Service: Earth-to-Space All Regions
- 42 Atmospheric Attenuation Windows
- 43 Point-to-Point Data Links
- 44 Wireless Local Area Networks (802.11 ad)
- 45 Millimeter Wave ISM Bands
- 46 EHF – Full Body Scanners
- 47 Active Denial Systems (US DoD)

Pulse waveform with characteristics



Radio detection and ranging (radar) abbreviations

AESA = Active Electronically Scanned Array AEW = Airborne Early Warning APAR = Active Phase Array Radar ASR = Airport Surveillance Radar ATC = Air Traffic Control BW = Bandwidth (or Beamwidth) CFAR = Constant False Alarm Rate COHO = Coherent Local Oscillator DOA = Direction of Arrival DTM = Digital Terrain Model EIRP = Effective Isotropic Radiated Power EMS = Electromagnetic Spectrum	EMV = Electromagnetic Vulnerability ESA = Electronically Steerable Array EVW = Electronic Warfare FCW = Forward Collision Warning FMCW = Frequency-Modulated Continuous Wave GCA = Ground-Controlled Approach IFF = Identification Friend or Foe LADAR = Laser Detection and Ranging LIDAR = Light Detection and Ranging LPI = Low Probability of Intercept LRR = Long-Range Radar MTD = Moving Target Detection	OTH = Over the Horizon PAR = Phased Array Radar PAR = Precision Approach Radar PC = Pulse Compression PD = Pulsed Doppler PDF = Pulse Desensitization Factor PESA = Passive Electronically Scanned Array PRF = Pulse Repetition Frequency PRI = Pulse Repetition Interval PRT = Pulse Repetition Time PSR = Primary Surveillance Radar PW = Pulse Width	RCS = Radar Cross Section RESM = Radar Electronic Support Measure RWR = Radar Warning Receiver RX = Receiver/Received SAR = Synthetic Aperture Radar SLR = Side-Looking Radar SMR = Surface Movement Radar SRR = Short-Range Radar SSR = Secondary Surveillance Radar TBD = Track Before Detect TRM = Transmit/Receive Module TX = Transmitter/Transmitted
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Radar applications by IEEE standard radar bands

Band	Frequency	Wavelength	Application
HF	3 MHz to 30 MHz	100 m to 10 m	Coastal radar systems, over-the-horizon (OTH) radars
VHF	30 MHz to 300 MHz	10 m to 1 m	Applied retrospectively to early radar systems
UHF	300 MHz to 1 GHz	1 m to 0.3 m	Very long range (e.g. ballistic missile early warning), ground penetrating, foliage penetrating
L	1 GHz to 2 GHz	30 cm to 15 cm	Long-range air traffic control and surveillance
S	2 GHz to 4 GHz	15 cm to 7.5 cm	Terminal air traffic control, long-range weather, marine radar
C	4 GHz to 8 GHz	7.5 cm to 3.75 cm	Satellite transponders, weather radar; a compromise (hence C) between X and S bands
X	8 GHz to 12 GHz	3.75 cm to 2.5 cm	Missile guidance, marine radar, weather, medium-resolution mapping and ground surveillance; in the USA the narrow range 10.525 GHz ± 25 MHz is used for airport radar. Named X band because the frequency was kept secret during World War 2
Ku	12 GHz to 18 GHz	2.5 cm to 1.67 cm	High-resolution mapping, satellite altimetry; frequency just under K band (hence u)
K	18 GHz to 27 GHz	1.67 cm to 1.11 cm	K band is used by meteorologists for detecting clouds and by police for speed enforcement. K band radar guns operate at 24.150 GHz ± 0.100 GHz. Automotive radar uses 24 GHz to 26 GHz
Ka	27 GHz to 40 GHz	1.11 cm to 0.75 cm	Mapping, short range, airport surveillance, photo radar, used to trigger cameras that take pictures of license plates of cars running red lights, operates at 34.300 GHz ± 0.100 GHz; frequency just above K band (hence a)
V	40 GHz to 75 GHz	7.5 mm to 4.0 mm	Military communications below 50 GHz. FMCW short-range radar above 50 GHz
W	75 GHz to 110 GHz	4.0 mm to 2.7 mm	76 GHz LRR and 79 GHz SRR automotive radar, high-resolution meteorological observation and imaging
mm	110 GHz to 300 GHz	2.7 mm to 1.0 mm	Experimental radar applications in sensing for security applications and imaging

www.rohde-schwarz.com/radar

