

---

# Index

## A

Absorbing clamp 135, 147  
Absorption loss 383, 462  
Accreditation 209  
Accredited testing 433  
Aerospace standards 111  
Air discharge 186, 194  
Air interface 55  
Air termination network (lightning protection) 424  
Alarm systems immunity standard 91  
Ambient signals 161  
Analogue circuits  
    balance 335  
    common mode rejection 334  
    decoupling 306  
    dynamic range 334  
    emissions 306  
    immunity 333  
    instability 306, 337  
    operating bandwidth 334  
Ancillary equipment 214  
ANSI C63.4 97  
Antenna mode coupling 232  
Antennas 127, 168  
    antenna factor 127, 458  
    balun 168  
    cable 159  
    calibration 158  
    gain 165, 458  
    polarization 130, 151, 159  
Apertures in shielded enclosures 385  
Arc suppression 378  
Artificial mains network 131  
Audio rectification 333  
Automotive EMC Directive 26, 100  
Automotive transients 192, 248  
Average detector 98, 123, 125, 151, 163

## B

Backplanes 298  
Backplate in cabinets 411  
Balanced circuits 335, 353  
Balun transformer 168  
Bandwidth 122, 154, 162  
Basic standards 50  
Benign equipment 29  
Biconical antenna 127, 165, 168  
BiLog antenna 127, 168  
Bonding  
    cable trays and ducts 409  
    enclosures and structures 408  
    of PECs 421  
Braided screened cable 348

Broadband emissions 122  
Broadband over power lines 14  
Broadcast ambient signals 161  
Broadcast receivers  
    emissions standard 86  
    immunity standard 86  
BS 613 369  
BS 6651 405, 421  
BS 6656, 6657 18  
BS 7671 404  
BS 7697 253  
BSI EMC committee GEL 210 71  
Build state for testing 212  
Bulk current injection 181

## C

Cabinet installation and maintenance 416  
Cable 340–357  
    adding ferrite sleeves 361  
    attenuation 128  
    balance 234  
    classification 418  
    coaxial 341  
    common mode impedance 358  
    connections 349  
    damping with absorber 135  
    enclosure penetrations 415  
    ferrite loaded 355  
    ground plane flexi 354  
    impedance at RF 243  
    layout and routing during testing 217  
    magnetic fields from 252  
    pigtail connection to screen 350  
    point of screen connection 285  
    radiated emissions 237  
    resonance 242  
    return currents 341  
    ribbon 354  
    routing in enclosures 412  
    screen at low frequencies 344  
    screen at RF 346  
    screen construction 347  
    screen cut-off frequency 344  
    screen grounding 344, 351  
    screening attenuation standards 349  
    segregation 418  
    surface transfer impedance 348  
    twisted pair 353  
    UTP vs. STP 356  
Cable trays 409, 420  
CAD layout software 268, 444  
Calibration  
    antennas 158

- ESD generator 185
  - RF measuring equipment 157
  - Capacitance versus geometry 463
  - Capacitive components 359
  - Capacitive coupling 225, 309, 337
  - Capacitive crosstalk 343
  - Capacitor self resonance 301
  - Cavity resonance 245
  - CDN (coupling/decoupling network) 179
  - CE mark 31
  - CE Marking Directive 31
  - CEN 72
  - CENELEC 70
    - interpretation sheets 219
  - Changes to standards 72
  - Characteristic impedance of PCB track 464
  - CISPR 67
    - 80/80 sampling scheme 35
    - measurement uncertainty 155
    - test site ellipse 141, 159
  - CISPR 11 75
  - CISPR 12 103
  - CISPR 13 86
  - CISPR 14-1 76
  - CISPR 15 88
  - CISPR 16-1-X 98, 122
  - CISPR 16-4-2 218
  - CISPR 16-4-4 11
  - CISPR 17 371
  - CISPR 20 86
  - CISPR 22 34, 77
  - CISPR 24 89
  - CISPR 25 103
  - CISPR 32 and 35 94
  - Clean/dirty box shielding 413
  - Clock emissions 296
  - Coaxial cable 341
  - Co-channel interference 10, 12
  - Common Bonded Network 406
  - Common impedance coupling 223
  - Common mode
    - cable impedance 358
    - choke 233, 368, 371, 373
    - components in mains filter 367
    - coupling 232, 247
    - current 232, 238, 340, 362
    - emissions 134, 236, 294
    - rejection 334
  - Common Mode Absorbing Device 135
  - Compatibility gap 20
  - Compliance test scheduling 431
  - Components (application of EMC Directive) 30
  - Conditional connection 202
  - Conducted emissions 146, 238, 312
    - equivalent circuit 240
  - Conducted immunity testing 179, 245
    - frequency range 182
    - test procedure 181
    - transducers 179
  - Conductive backshell 350
  - Conductive coatings 395
  - Conductive gaskets 392
  - Conductor properties 463
  - Connectors
    - backshell 350
    - filtered 373
    - in testing 157
    - in unshielded compartment 398
    - pigtail connection to screen 350
    - to screened cable 349
  - Constant impedance tracks 278
  - Contact discharge 186
  - Contact suppression 378
  - Control plan 437
  - Control systems 8
  - Costs of EMC 427
  - Council Decision 90/683/EEC 35
  - Country identifiers 63
  - Coupling
    - cables 242
    - common impedance 223, 261
    - conducted emissions 238
    - distributed 227
    - effect of input impedance 226
    - electric induction 225
    - electrostatic discharge 317
    - from PCB 235
    - magnetic induction 224
    - modes 232, 247
    - radiated field 241
    - reciprocity 242
    - to transmission line 465
    - transient 315, 323
    - via mains supply 228, 239
  - Creepage and clearance for ESD 318
  - Crosstalk
    - in cables 342
    - on PCBs 278
  - Current injection 181, 245
  - Current probe 136, 181
- D*
- Damping factor 466
  - Data corruption 9
  - Data line filters 373
  - Data security 19
  - Date of cessation of presumption of conformity 73
  - Dated references 73
  - DeciBel (dB) 457
    - table of ratios 458
  - Declaration of conformity 32
  - Decoupling 300, 306
    - choice of capacitor 302
  - DEF STAN 59-41 107, 153, 194, 209, 438
  - Definition of EMC 1
  - Degradation of audio or video 9
  - Delta-I noise 292
  - Design checklist 441
  - Design reviews 429
  - Design rules 428
  - Diagnostic tests 147
  - Diathermy 6, 12
  - Differential mode
    - capacitors in mains filter 369
    - choke in mains filter 372
    - coupling 232, 247

- current 238, 340, 362
- emissions 134, 235, 292, 312
- Digital circuits, see logic
- Digital radio services 10
- Dipole antenna 458
- Directives (other than EMC and R&TTE) 26, 30
  - 2004/104/EC 26, 100
  - 2004/40/EC 178
  - 72/245/EEC 24
  - 73/23/EEC 26, 31, 56
  - 76/889/EEC 24
  - 76/890/EEC 24
  - 93/68/EEC 31
  - 95/54/EC 26, 100
- Discrete Fourier transform 198, 468
- Distributed coupling 227
- DO-160E 111
- Down conductors (lightning protection) 424
- Draft standards 71
- Drain wire 348, 349
- Dwell time 125, 177
- Dynamic noise margin 322
- Dynamic range of circuits 334
- E*
- Earth line choke 372
- Earth, safety 266, 316, 404
- Earthing
  - bonding of structures 409
  - Common Bonded Network 406
  - conductors 408
  - functional earth 405
  - ground loops 407
  - lightning protection 405, 425
  - main earthing terminal 406
  - MESH-BN 406
- EFT-Burst test 187
- Electric field 229
- Electric field strength 127, 460
- Electric induction 225
- Electrochemical series 395
- Electro-explosive devices (EEDs) 18
- Electromagnetic compatibility
  - compatibility gap 20
  - control measures 258
  - data security 19
  - definition 1, 7
  - intra-system vs. inter-system 7, 39
  - mains supply 13
  - phenomena 9, 27
  - radio interference 10
  - scope 8
- Electromagnetic fields 229, 459
  - health hazards 20, 56, 178
- Electromagnetic modelling 444
- Electromagnetic weapons 19
- Electrostatic discharge 9, 249
  - coupling 250, 317
  - creepage and clearance 318
  - protection 318
  - secondary discharge 251
  - test application 185
  - test generator 184
  - ungrounded EUTs 187
  - waveform 250
- Electrosurgery 6
- EM code for enclosures 401
- EMC assessment 44, 438
- EMC control plan 437
- EMC co-ordinator 427
- EMC Directive 26–53
  - benign equipment 29
  - CE mark 31
  - changes from first to second edition 27
  - compliance with 43–53
  - components 30
  - declaration of conformity 32
  - EMC assessment 44, 438
  - empowered signatory 33
  - enforcement 41
  - essential requirements 28, 51
  - exceptions from scope 29
  - fixed installations 36–40
  - generic standards 49
  - good engineering practices for fixed installation 39
  - harmonised standards 45
  - identification of equipment 32
  - information requirements 34
  - interpretation 42
  - manufacturer 29
  - Notified Bodies 46, 53
  - placed on the market 28
  - presumption of conformity 51, 73
  - quality assessment 35
  - residential area limitation 34
  - responsible person for fixed installation 38
  - second hand products 28
  - self certification 44, 52
  - specific apparatus for fixed installation 40
  - standards 33
  - sub-assemblies 31
  - systems 41
  - taking into service 29
  - technical documentation 45
  - testing 33
  - timescale 26
- EM-clamp 180
- EMCTLA technical guidance notes 43, 138
- Emissions limits 11, 17, 98
- Emissions testing 118–163
  - above 1GHz 152
  - configuration 149
  - height scan 143, 151
  - in screened chamber 144
  - layout 148
  - military methods 153
  - procedure 150
- EMSCAN 139
- EN 132400 370
- EN 300386 91
- EN 301489 72, 92
- EN 50065-1 14
- EN 50121-X 115
- EN 50130-4 91
- EN 50289-1-6 349

- EN 55011 75
- EN 55013 86
- EN 55014-1 76, 135
- EN 55014-2 87
- EN 55015 88
- EN 55020 86
- EN 55022 34, 77, 136, 149
- EN 55024 89
- EN 55103 89
- EN/IEC 60601-1-2 93
- EN/IEC 60945 93
- EN/IEC 61000-3-2 80, 196
- EN/IEC 61000-3-3 81, 201
- EN/IEC 61000-4-10 84
- EN/IEC 61000-4-11 84, 206
- EN/IEC 61000-4-12 84, 191
- EN/IEC 61000-4-15 204
- EN/IEC 61000-4-2 82, 184
- EN/IEC 61000-4-20 140, 172
- EN/IEC 61000-4-3 82, 164
- EN/IEC 61000-4-4 83, 188
- EN/IEC 61000-4-5 83, 189
- EN/IEC 61000-4-6 83, 179
- EN/IEC 61000-4-7 198
- EN/IEC 61000-4-8 83, 206
- EN/IEC 61000-4-9 84
- EN/IEC 61000-6-1 78
- EN/IEC 61000-6-2 79
- EN/IEC 61000-6-3 74
- EN/IEC 61000-6-4 75
- EN/IEC 61326 90
- EN/IEC 61547 89
- Enclosure bonding 408
- Energy content of transients 247
- Engineering changes 437
- Equipotential bonding 404, 406
- ETSI 71
  - radio standards 72
- EU country identifiers 63
- European Commission
  - Blue Guide 23, 50
  - Council Decision 90/683/EEC 35
  - Council Recommendation 1999/519/EC 178
  - Decision 2000/299/EC (R&TTE) 60
  - Recommendation on PLT 15
- European Union countries 470
- Even harmonics 289
- Exercising during the test 214
- F*
- Fabric over Foam conductive gasket 394
- Far field 127, 139, 230, 459
- Faraday's law 130
- Far-end crosstalk (FEXT) 227, 344
- Fast transient burst specification 188
- FCC rules 96
- Feedthrough capacitor 366
- Ferrite
  - absorbing clamp 135, 147
  - application 364
  - chip inductor 305, 307, 335, 365
  - component selection 363
  - effect of impedance 362
  - loaded cable 159, 355
  - saturation 364, 371
  - sleeves on cables 361
  - tile absorber 145
- Fibre optic data transmission 337
- Field equations 461
- Field strength 460
  - for immunity tests 12, 165
  - from cable 237
  - from small loop 235
  - monitor 167
  - safety 178
  - specifications 127
  - variation over distance 11
- Field uniformity 174
- Filter 357–375
  - 2nd order low pass, calculation 466
  - circuit effects 374
  - component layout 360
  - component parasitics 358
  - configuration 357
  - connectors 373
  - core saturation 371
  - damping factor 466
  - earth line choke 372
  - feedthrough capacitor 366
  - ground connection 360
  - I/O connections 373
  - input RC 334
  - insertion loss 370
  - mains 316, 367
  - SMPS input 312
  - terminating impedance 358
  - three terminal capacitor 365
- Fixed installations 36–40, 403
  - good engineering practices 39
  - responsible person 38
  - specific apparatus 40
- Flammable atmospheres 18
- Flicker 201, 254
- Foil screened cable 348
- Form in Place gaskets 394
- Fourier series 467
- Fourier transform 288, 467
- Free radiation frequencies 12, 178
- Frequency domain 288
- Fully anechoic room 145
- Functional earth 405
- G*
- Gas discharge tube suppressors 377
- GE/RT8015 113
- Generic standards 49, 74
  - environment classes 49
  - immunity performance criteria 49, 220
- Glands for cables 415
- Gridded ground layout 269
- Ground 261–267
  - at system ADC 284
  - cable screen connection 285, 344
  - comb layout 270
  - conductors 408
  - definition 261

- filter connection 360
  - grid layout 269
  - hybrid system 264
  - impedance 261
  - interface connections 283
  - map 267
  - multi-point system 264
  - noise voltages 237
  - PCB ground plane 271–278
  - provided by shield 389
  - return conductors in ribbon cable 354
  - safety 266
  - single point system 264
  - transfer impedance 263
  - wire impedance 266
- Ground bounce 324
- Ground loops in systems 407
- Ground plane 271–278
  - discontinuities in 275
  - double-sided PCBs 272
  - impedance 271
  - in ribbon cable 354
  - on low-cost pcbs 272
  - on multilayer PCBs 276
  - single universal plane 285
  - slot in 276
- Ground plane flexi 354
- Ground plane for testing
  - conducted emissions 146
  - EFT-burst 188
  - ESD 185
  - radiated emissions 141
- GTEM cell
  - for radiated emissions tests 140
  - for radiated immunity tests 171
- Guard trace 317
- H*
- Harmonic spectrum 289, 468
- Harmonisation 50
- Harmonised standards 33, 45
- Health hazards 20, 56
- Heatsinks 281, 309
- Height scan 143, 151
- Honeycomb panels 400, 416
- Horn antenna 153
- Hospital equipment 5
- Household appliances immunity standard 87
- Hybrid absorber 145
- Hybrid ground 264
- I*
- I/O filtering 373
- I/O grounding 283
- ICNIRP guidelines 20, 178
- IEC 65
  - CISPR 67
  - TC77 68
- IEC 60050 68
- IEC 61000 66, 67, 79–85
- IEC 61000-3-2 255
- IEC 61000-5-2 418, 420
- IEC 61000-5-7 401
- IEC 62153-4 349
- IEC 62305 405, 421
- IEE Wiring Regulations 404
- Image plane 390
- Immunity tests 164–195
  - magnetic field 205
  - military 194
  - performance criteria 49, 219
  - voltage dips and interrupts 206
- Immunity-related functions (vehicle) 101
- Impedance
  - of free space 127, 230, 459
  - of ground wires 266
  - of PCB tracks 268, 272
  - terminating filters 358
- In situ measurements 41
- Independent windows method 177
- Indium tin oxide 397
- Inductance versus geometry 464
- Induction field 462
- Inductive components 360
- Inductive coupling 224
- Inductive crosstalk 343
- Inductive load suppression 379
- In-house testing 433
- Input data validation and averaging 330
- Input VSWR 126
- Inrush current limitation 201, 207
- Insertion loss 370
- Instability 306, 337
- Interface
  - ESD protection 320
  - filtering 373
  - ground 282
- Interference complaints 11
- Interference power measurement 135
- International Electrotechnical Vocabulary 68
- Interrupts 331
- Intra-system vs. inter-system EMC 7, 39, 222, 403
- ISM equipment 12
- ISO 7637 193
- ISO 9000 436
- ISO automotive immunity tests 103
- ISO/IEC 17025 194, 209, 433
- Isolation 337
- J*
- Jamming 19
- K*
- Keyboards, ESD protection 319
- Knitted wire mesh gasket 394
- L*
- LAB 34 155, 183, 218, 219
- Lapped wire screened cable 348
- Layer stack-up on multilayer pcbs 277
- Layout 259–267
  - of filter components 360
  - of transient suppressors 378
  - PCB 268
- Leakage current 370
- LF immunity testing 205–208

- Lighting equipment standard 88
- Lightning
  - damage to electronic equipment 422
  - electric field 422
  - induced voltage 421
  - protection system 423
  - protective earth 405
- Lightning induced transient tests 111
- Line Impedance Stabilizing Network (LISN) 131, 371
- Log periodic antenna 127, 165, 168
- Logic
  - allowable loop area 294
  - backplanes 298
  - circuit radiation 292
  - clock radiation 296
  - common mode emission 294
  - decoupling 300
  - differential mode emission 292
  - family 289
  - input immunity 321
  - low voltage families 298
  - RF susceptibility 323
  - ringing 299
  - risetime 289
  - supply current 292
  - timing jitter with RF 323
  - transition times 294
- London Underground standards 115
- Longitudinal Conversion Loss 16, 234, 356
- Loop antenna 130
- Low pass filter 466
- Low Voltage Directive 26, 31, 56
- M*
- Magnetic field strength 460
- Magnetic fields 229, 251, 344, 384
  - immunity testing 205
- Magnetic induction 224
- Magnetic shielding in cables 344
- Main earthing terminal 406
- Mains harmonic emissions 13, 196–201, 254
  - equipment classification 200
  - test conditions 199
  - test equipment 197
  - wave analyser 198
- Mains signalling 14
- Mains supply
  - coupling 228, 239
  - disturbances 13
  - filters 367
  - input series resistance 255
  - interference propagation 118
  - non-linear loads 255
  - transients 14, 245
  - voltage fluctuations 13, 206, 253
  - wiring at RF 228
- Managing EMC 426–440
  - test management 430
- Margins against emissions limits 218
- Maritime navigation equipment standard 93
- Marketing responsibility for EMC 221
- Measurement
  - above 1GHz 152
  - distance (emissions) 142
  - distance (immunity) 176
  - duration 125, 151
  - in situ 41
- Measurement standards 98
- Measurement uncertainty 155
  - ambients 161
  - budget (emissions) 159
  - emissions 218
  - human factor 161
  - RF immunity 183, 219
  - transient tests 194
- Measuring receiver 118
  - input VSWR 126
- Medical devices 3
- Medical electrical equipment standard 93
- Membrane keypads, ESD protection 319
- Memory protection 331
- Mesh screen 398
- MESH-BN 406
- MHRA recommendations 5
- Microprocessor software 328, 329
- Microprocessor watchdog 326
- Microstrip 279
- MIL STD 461 109, 153
- Military equipment 29
- Military equipment standards 106–111
- Mismatch error 157, 459
- Mobile phones 22, 56
  - in aircraft 2
- Modulation 166
- Monopole antenna 130, 237
- Motor drive connections 413, 419
- Motor interference 379
- Mould in Place conductive elastomer 394
- MPT 1570 15
- Multilayer PCBs 276
- Multi-point ground 264
- Mu-metal 384
- Mutual inductance 224, 272, 464
- Mutual interference 13
- N*
- Narrowband
  - emissions 122
  - immunity 178
- NB 30 15
- Near field 118, 139, 230, 459
  - probes 139
- Near-end crosstalk (NEXT) 227, 344
- Network termination point 55
- New Approach Directives 23
- Noise floor 122, 128, 152
- Non-linearity of op-amps with RF 336
- Normalized Site Attenuation 143
- Notified Bodies 46, 53, 59
- Nuclear electromagnetic pulse 19
- O*
- Odd harmonics 289
- Official Journal of the European Union 24, 45, 71
- Ohms per square 397
- Open area test site (OATS) 141

- uncertainties 159
- Operator interface 319
- Opto-coupler 337
- Oriented wire conductive gasket 394
- Overload factor 124
- P*
- Parallel earth conductor 345, 419, 420
  - bonding 421
  - cable trays 420
- Parallel voting 71
- Parasitic reactances 358
- Partitioning 259, 285
- PCB
  - as patch antenna 236
  - characteristic impedance 464
  - constant impedance tracks 278
  - design rules 286
  - heatsinks on ICs 281
  - image plane 390
  - interface ground 282
  - layer thickness 281
  - layout 268–287, 293
  - loop area 293, 308, 391
  - on-board shield 400
  - power planes 277, 280, 305
  - radiated emissions 235
  - track impedance 268, 272
  - track length 295
  - track propagation delay 464
- Peak detector 123, 151
- Performance criteria 49, 219
- Permeability 385
  - of free space 459
- Permittivity
  - of free space 459
  - of PCB material 279
- Phase angle control 256
- Physical Agents Directive 178
- Pigtail 350, 422
- Plated metal surfaces 394
- PLL frequency multiplication 298
- Power amplifier 165
- Power density 459
- Power factor correction 255
- Power line telecommunication 14
- Power plane
  - decoupling 305
  - layout and segmentation 280, 305
- Power rail immunity 321
- Power requirement vs. field strength 165
- Power supply rejection ratio 306
- Power switching circuits 314
- Pre-compliance tests 147, 430
- Preselector 121
- Presumption of conformity 51, 73
- Product specification 428
- Product standards 72, 85–96
- Production QA testing 435
- Program memory 332
- Programmable devices 333
- Propagation delay of PCB track 300, 464
- Properties of conductors 463
- Prospective touch voltage 404
- Protection factor 10
- Pulsed modulation for RF immunity 167
- Pyramidal foam absorber 145
- Q*
- Quality assessment 35
- Quality assurance 435
- Quasi-peak detector 98, 124, 151
- R*
- R&TTE Directive 54–64
  - conformity assessment procedures 58
  - equipment classification 60
  - equipment marking 64
  - essential radio test suites 57
  - essential requirements 56
  - information for the user 63
  - modules 55
  - notification 62
  - Notified Body 59
  - scope 55
  - spectrum use 57
- Radio absorbing material (RAM) 145
- Radio amateurs 179
- Radio equipment 54
  - in vehicles 102
  - product standard 92
- Radio interference 10
  - jamming 19
  - probability 11
- Radio spectrum (HF) 15
- Railway Group Standards 113
- Rayleigh criterion 230
- Reciprocity 242
- Rectifier reverse recovery 314
- Reflection coefficient 459
- Reflection loss 383, 462
- Reflections on test site 159
- Relative humidity 194, 250
- Resistor, in series on digital signals 297
- Resonance
  - in conducted emissions 312
  - in enclosures 245, 386
  - in ground wires 266
  - of PCB planes 280
  - on cables 242
- Return currents in cables 341
- RF emissions limits 11, 98
- RF emissions tests 118–163
- RF immunity testing 164–184
  - above 1GHz 176
  - ancillary equipment 175
  - conducted testing 179
  - field uniformity 174
  - independent windows method 177
  - layout and configuration 175
  - preliminary checks 175
  - safety 178
  - spot frequency testing 179
  - sweep rate 177
- RF signal source 165
- Ribbon cable 354

- Ring wave test 191
- Ringing 299
- RoHS Directive 392
- S*
- SAE automotive immunity tests 103
- Safety approval of mains filters 369
- Safety earth 266, 316, 404, 408
  - current from LISN 134
  - leakage current 370
- Sample testing 436
- Sampling schemes 35
- Screened room 144, 161, 172
  - resonances 173
- Secondary discharge 251
- Self resonant frequency (SRF) 301
- Sequence of tests 214
- Series stopper resistors 297, 334
- Shield as ground reference 389, 410
- Shielding 381–401, 462
  - absorption loss 383
  - apertures 385
  - cable penetrations 415
  - clean/dirty box 413
  - conductive coatings 395
  - effectiveness 383, 463
  - enclosure resonance 386
  - hardware 392
  - honeycomb panels 416
  - LF magnetic fields 253, 384
  - mesh screen 398
  - on PCB 400
  - plated surfaces 394
  - reflection loss 383
  - seams 388
  - transfer impedance 411
  - transmission line theory 385
  - windows and ventilation slots 397, 416
- Signal generator 165
- Signal integrity 324
- Signal line transients 247
- Single European Market 23
- Single point ground 264
- Sinusoidal power converters 308
- Site attenuation 141, 143
- Skin depth 347, 383, 462
- SLIM 25
- Slot in pcb ground plane 276
- Small loop model 235
- Snubber 378
  - in SMPS 309
- Software 9, 328, 329
- Spacing of conductors 226
- Specific Absorption Rate (SAR) 21
- Spectral density of transients 247
- Spectrum analyser 119
  - low cost 126
  - preselector 121
  - sweep rate 125
  - tracking generator 121
  - video bandwidth 124
- Spectrum management 13
- Spiral wrap conductive gasket 394
- Spread-spectrum clock generation 298
- Spring finger stock 394
- Standard Site Method (antenna cal) 158
- Standards 65
  - Annex ZA 73
  - ANSI C63.4 97
  - basic 50
  - BS 613 369
  - BS 6651 405, 421
  - BS 6656, 6657 18
  - BS 7671 404
  - BS 7697 253
  - CISPR 16-1-X 98, 122
  - civil aerospace 111
  - dated references 73
  - DEF STAN 59-41 107, 153, 438
  - DO-160E 111
  - draft 71
  - emissions limits 98
  - EN 300386 91
  - EN 301489 72, 92
  - EN 50065-1 14
  - EN 50121-X 115
  - EN 50130-4 91
  - EN 50289-1-6 349
  - EN 55011 75
  - EN 55013 86
  - EN 55014-1 76, 135
  - EN 55014-2 87
  - EN 55015 88
  - EN 55020 86
  - EN 55022 77, 136, 149
  - EN 55024 89
  - EN 55103 89
  - EN/IEC 60601-1-2 93
  - EN/IEC 60945 93
  - EN/IEC 61000-3-2 80, 196
  - EN/IEC 61000-3-3 81, 201
  - EN/IEC 61000-4-10 84
  - EN/IEC 61000-4-11 84, 206
  - EN/IEC 61000-4-12 84, 191
  - EN/IEC 61000-4-15 204
  - EN/IEC 61000-4-2 82, 184
  - EN/IEC 61000-4-20 140, 172
  - EN/IEC 61000-4-3 82, 164
  - EN/IEC 61000-4-4 83, 188
  - EN/IEC 61000-4-5 83, 189
  - EN/IEC 61000-4-6 83, 179
  - EN/IEC 61000-4-7 198
  - EN/IEC 61000-4-8 83, 206
  - EN/IEC 61000-4-9 84
  - EN/IEC 61000-6-1 78
  - EN/IEC 61000-6-2 79
  - EN/IEC 61000-6-3 74
  - EN/IEC 61000-6-4 75
  - EN/IEC 61326 90
  - EN/IEC 61547 89
  - FCC 96
  - GE/RT8015 113
  - generic 49, 74
  - IEC 61000 66, 67, 79–85



- IEC 61000-3-2 255
  - IEC 61000-5-2 418, 420
  - IEC 61000-5-7 401
  - IEC 62153-4 349
  - IEC 62305 405, 421
  - ISO 7637 193
  - ISO/IEC 17025 194, 433
  - London Underground 115
  - measurement 98
  - MIL STD 461 109, 153
  - product-specific 72, 85–96
  - railway 113
  - revisions and amendments 72
  - Statutory Instruments 24
  - Steering diodes 320
  - Stripline
    - PCB track 279, 465
    - test equipment 169
  - Structured cabling 356
  - Substitution method of field strength setting 168
  - Supply current of logic ICs 292
  - Surface transfer impedance 348
  - Surge suppressors 373
  - Surge test 189
  - Sweep rate
    - emissions 125
    - immunity 177
  - Switchmode power supply 239, 255, 307
    - heatsinks 309
    - rectifier reverse recovery 314
    - resonances in coupling 312
  - System partitioning 259, 285
  - System sensitivity 128
  - Systems EMC 222
- T*
- TC77 67
  - Technical barriers to trade 23, 42
  - Technical guidance notes 43
  - Telecom Certification Body 97
  - Telecom network equipment standard 91
  - Telecom port ISN 136
  - Telecom terminal equipment 54
  - TEM cell 170
  - Tempest 19
  - Terminating shielded cables 351
  - Test configuration 149, 175, 185, 211
  - Test equipment
    - ancillary equipment 175
    - antenna factor 127
    - antenna polarization 130
    - average detector 123, 125, 163
    - bandwidth 122, 154, 162
    - biconical antenna 127
    - calibration 157, 185
    - capacitive coupling clamp 188
    - CDN (coupling/decoupling network) 180
    - CMAD 135
    - current probe 136, 180
    - dwell time 125
    - EFT coupling/decoupling network 188
    - EM-clamp 180
    - ESD generator 184
    - ferrite absorbing clamp 135
    - field strength monitor 167
    - flickermeter 202
    - GTEM cell 140, 171
    - harmonic wave analyser 198
    - horizontal coupling plane 185
    - input VSWR 126
    - LISN 131
    - log periodic antenna 127
    - loop antenna 130
    - magnetic field immunity 206
    - mains harmonics 197
    - measurement time 125
    - measuring receiver 118
    - mismatch error 157
    - modulation 166
    - monopole antenna 130
    - near field probes 139
    - noise floor 122, 128, 152
    - overload factor 124
    - peak detector 123
    - quasi-peak detector 124
    - RF power amplifier 165
    - RF signal source 165
    - spectrum analyser 119
    - stripline 169
    - surge generator 189
    - system sensitivity 128
    - telecom port ISN 136
    - TEM cell 170
    - transient generator 188
    - uncertainty 155
    - voltage dips and interrupts 207
  - Test facilities
    - ancillary requirements 216
    - anechoic screened room 144, 161, 172
    - conducted emissions 146
    - fully anechoic room 145
    - ground plane 141, 185, 188
    - minimum lab set-up 147
    - open area test site 141, 159
    - production QA 435
    - site attenuation 143
    - turntable 148
    - weatherproof structure 143
  - Test layout 148, 175, 185, 217
  - Test options for compliance 432
  - Test plan 209–219
  - Test procedure 150, 214
  - Test report 433
  - TETRA 5, 106
  - Thermostats 6
  - Three-terminal capacitor 365
  - Time domain 288
  - Timescales in product development 427, 430
  - Timing jitter with RF 323
  - Token passing 331
  - Touch voltage 404
  - Tracking generator 121
  - Transfer impedance 348
    - of structures 263, 411
  - Transformer construction (SMPS) 308, 309
  - Transformer fields 251

- Transformer isolation 337
  - Transient
    - automotive 248
    - coupling 315, 323
    - energy content 247
    - generator 188
    - on mains 245
    - on signal lines 247
    - protection 318
    - spectral density 247
    - upset window 323
  - Transient immunity testing 179, 184–194
    - automotive transients 192
    - ESD discharge application 185
    - fast transient burst 188
    - layout and configuration 185
    - ring wave 191
    - surge test 189
    - transient generator 188
    - transient timing 193
  - Transient suppressors 320, 375
    - in mains filters 373
    - layout 378
  - Transition region 230
  - Transmission line
    - cable model 243
    - distributed coupling 465
    - model for ground wire 266
    - ringing 299
  - Triboelectric induction 249
  - Twisted pair 341, 353
- U*
- UKAS 155
- V*
- Van Veen loop 130
  - Varistors 375
  - Vehicle immunity-related functions 101
  - Vehicle manufacturer EMC requirements 104
  - Video signal setup for tests 214
  - Voltage dependent resistor 373, 375
  - Voltage dips and interrupts 206
  - Voltage variations 13, 253
  - VSWR 157, 168, 459
- W*
- Watchdog 326
  - Wave impedance 230, 383, 459
  - Waveguide below cut-off 400
  - WEEE Directive 392
  - Windows in shields 397
  - Wireless Telegraphy Act 24
- Z*
- Zener transient suppressors 377