

# ISO 14302:2022-06 (E)

## Space systems - Electromagnetic compatibility requirements

---

<b>Contents</b>		<b>Page</b>
<b>Foreword</b> .....		<b>v</b>
<b>Introduction</b> .....		<b>vi</b>
<b>1 Scope</b> .....		<b>1</b>
<b>2 Normative references</b> .....		<b>1</b>
<b>3 Terms, definitions and abbreviated terms</b> .....		<b>1</b>
3.1 Terms and definitions.....		1
3.2 Abbreviated terms.....		3
<b>4 Requirements</b> .....		<b>5</b>
4.1 General system requirements.....		5
4.1.1 General.....		5
4.1.2 System-level EMC programme.....		5
4.1.3 Equipment/subsystem criticality categories.....		8
4.1.4 Safety margins.....		8
4.2 Specific system requirements.....		8
4.2.1 External electromagnetic environment.....		8
4.2.2 Intrasystem EMC.....		8
4.2.3 EMI control.....		8
4.2.4 Grounding and wiring design.....		8
4.2.5 Electrical bonding.....		9
4.2.6 Antenna-to-antenna (RF) compatibility.....		10
4.2.7 Lightning.....		10
4.2.8 Spacecraft and electrostatic charging.....		10
4.2.9 Hazards of electromagnetic radiation.....		12
4.2.10 Life cycle considerations.....		12
4.2.11 External grounds.....		12
4.2.12 Spacecraft d.c. magnetic emissions.....		12
4.2.13 Electric propulsion systems.....		12
4.3 Equipment-level EMI requirements.....		13
4.3.1 General.....		13
4.3.2 Power bus conducted interference, time and frequency domain, source induced.....		13
4.3.3 Power bus conducted interference, load induced, frequency domain.....		13
4.3.4 Power bus load-induced switching transient emissions.....		14
4.3.5 Power bus load-induced time domain ripple.....		15
4.3.6 Signal cable conducted interference, frequency domain.....		15
4.3.7 Antenna connection port spurious emissions.....		15
4.3.8 Magnetic field radiated emissions.....		15
4.3.9 Radiated electric field emissions.....		15
4.3.10 Immunity to audio frequency power-line ripple.....		15
4.3.11 Immunity to power-line switching transients.....		15
4.3.12 Immunity to the conducted effects of radiated electromagnetic fields.....		16
4.3.13 Immunity to audio frequency radiated magnetic fields.....		16
4.3.14 Immunity to radiated electromagnetic fields.....		16
4.3.15 Immunity to magnetic fields induced signals to cabling.....		16
4.3.16 Control of antenna port immunity to out-of-band interference.....		16
4.3.17 Immunity to electrostatic discharge.....		16

4.3.18	Passive Intermodulation (PIM).....	16
4.3.19	Multipaction .....	16
<b>5</b>	<b>Verification.....</b>	<b>16</b>
5.1	General system requirements.....	16
5.1.1	General .....	16
5.1.2	System-level electromagnetic effects verification plan (EMEVP).....	17
5.1.3	Electromagnetic effects verification report (EMEVR).....	17
5.1.4	Safety margin demonstration of critical/EED circuit.....	17
5.2	Specific system requirements.....	18
5.2.1	External electromagnetic environment.....	18
5.2.2	Intrasystem electromagnetic compatibility.....	18
5.2.3	Electromagnetic interference control.....	18
5.2.4	Grounding and wiring design.....	18
5.2.5	Electrical bonding.....	18
5.2.6	Antenna-to-antenna (RF) compatibility.....	19
5.2.7	Lightning.....	19
5.2.8	Spacecraft and static charging.....	19
5.2.9	Hazards of electromagnetic radiation.....	20
5.2.10	Life cycle.....	20
5.2.11	External grounds.....	20
5.2.12	Spacecraft d.c. magnetic emissions.....	20
5.3	Equipment-level EMI testing.....	20
5.3.1	General .....	20
5.3.2	Power bus conducted interference, time and frequency domain, source induced.....	21
5.3.3	Power bus conducted interference, load induced, frequency domain.....	21
5.3.4	Power bus load-induced switching transients.....	21
5.3.5	Power bus load-induced time domain ripple.....	21
5.3.6	Signal cable conducted interference, frequency domain.....	21
5.3.7	Antenna connection port spurious emissions.....	22
5.3.8	Magnetic field radiated emissions.....	22
5.3.9	Radiated electric field emissions.....	22
5.3.10	Immunity to audio frequency power-line ripple.....	22
5.3.11	Immunity to power-line switching transients.....	22
5.3.12	Immunity to the conducted effects of radiated electromagnetic fields.....	22
5.3.13	Immunity to audio frequency radiated magnetic fields.....	22
5.3.14	Immunity to radiated electromagnetic fields.....	22
5.3.15	Immunity to magnetic fields induced signals to cabling.....	22
5.3.16	Control of antenna port immunity to out-of-band interference.....	22
5.3.17	Immunity to electrostatic discharge.....	22
	<b>Annex A (informative) Rationale behind requirements and tests.....</b>	<b>24</b>
	<b>Bibliography.....</b>	<b>46</b>