

TEKNİK RAPOR / TECHNICAL REPORT

OPH-T-07729-00 Rev00 Tarih /Dated 24.04.2025

Başvuru sahibi /
Applicant : SMARTEQ BİLİŞİM VE İLETİŞİM TEK. SAN. VE TİC. LTD. ŞTİ.
Düzenleyici Mevzuat /
Regulatory act : BM/AEK Regülasyon No. 10 /
UN ECE Regulation No. 10
Elektromanyetik Uyumluluk /
Electromagnetic Compatibility
Eklenti 3, değişiklik seviyesi 06 /
Supplement 3 to the 06 series of amendments
Tip / Type : MNVR, IP Kamera

Başvuru türü / Application for:

- ☐ Sistem / System
☒ Komponent / Component
☐ Ayrı teknik ünite / Seperate technical unit

Onay durumu / Information regarding approval status:

- ☐ İlk başvuru / First application
☐ Genişletme başvurusu / Application for extension
☒ Sadece Test Raporu / Test Report only

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1. EKLER / ATTACHMENTS

- 1.1 Üreticinin bilgi dökümanı /
Manufacturer's information document
- No. / No: DS-2504-00
Tarih / Date: 14/03/2025

2. GENEL BİLGİ / GENERAL INFORMATION

- 2.1 Markası (imalatçının ticari adı) /
Make (trade name of manufacturer) : Movita
- 2.2 Tip /
Type : MNVR, IP Kamera
- 2.3 Ticari tanım(lar) /
Commercial name(s) : MXVR, Movita IP-W, Movita IP-B
- 2.4 Araç üzerinde işaretli ise, tip tanıtım şekli /
Means of identification of type, if marked on the vehicle : Uygulanmaz / Not applicable
- 2.4.1 Bu işaretin yeri /
Location of that marking : Uygulanmaz / Not applicable
- 2.5 Aracın kategorisi /
Category of vehicle : Uygulanmaz / Not applicable
- 2.6 Üreticinin şirket adı ve adresi /
Company name and address of manufacturer : SMARTEQ BİLİŞİM VE İLETİŞİM TEK.
SAN. VE TİC. LTD. ŞTİ.
Macun Mahallesi Batı Bulvarı 177. Cadde
Batı İş Merkezi No:28/66
Yenimahalle/Ankara
- 2.7 Montaj fabrikasının (fabrikalarının) adı (adları) ve
adres (adresleri) /
Name(s) and address(es) of assembly plant(s) : SMARTEQ BİLİŞİM VE İLETİŞİM TEK.
SAN. VE TİC. LTD. ŞTİ.
Macun Mahallesi Batı Bulvarı 177. Cadde
Batı İş Merkezi No:28/66
Yenimahalle/Ankara
- 2.8 Üretici temsilcisinin adı ve adresi (varsa) /
Name and address of the manufacturer's
representative (if any) : Uygulanmaz / Not applicable
- 2.9 Onay işaretinin yeri /
Location of approval mark : Gövdeye etiketleme ile, ek 1'e bkz. / with
the stich label on the body, see annex 1

Tarih / Date : 18.03.2024

Yer / Location : EMC Test ve Kontrol Hizmetleri San. Tic. A.Ş. İbrikdere,Kocaeli/Turkey

3. GENİŞLEME NEDENLERİ / REASONS FOR EXTENSION

Uygulanmaz / Not applicable

4. TEST EKİPMANI VE KOŞULLAR / TEST EQUIPMENT AND CONDITIONS

4.1. Ekipman adı / Equipment name

ID Number / Serial no

EMI test alıcısı / EMI test receiver	: EMC0106
Sinyal üretici / Signal generator	: EMC0004
Antenler / Antennas	: EMC0073, EMC0003, EMC0087
Şarj istasyonu / güç kaynağı / Charging station / power mains	: EMC0036, EMC0125,
Empedans sabitleyici / Impedance stabilization (IS)	: EMC0170, EMC0171
Bağışıklık test sistemi / Conducted immunity test system	: EMC0016
Elektronik anahtar / Electronic switch	: EMC0005
Osiloskop/ oscilloscope	: EMC0122
Simülasyon ve izleme sistemi / Simulation and monitoring system	: EMC0107, EMC0108,
Darbe jeneratörü / Pulse generator	: EMC000
Multimetre / Multimeter	: OPH125
Şerit metre / Tape measure	: OPH116

4.2. Ambient conditions

Test alanı / Testing area

☒ ALSE

☐ OATS

Dış saha testi için / For OATS testing:

Sıcaklık / Temperature

:

Nem / Humidity

:

BTK İzni / BTK permit

:

CISPR 16-1-4, madde 5.1. şartları / Requirements for CISPR 16-1-4, item 5.1.

☐ Düz zemin / Level terrain

☐ Bina, elektrik hattı vs'den uzaklık / Void of buildings, electric lines, etc.

☐ Yer altı şebeke ve boru hatLARINDan uzaklık / Free from under ground cables, pipelines, etc.

5. TEST NUMUNESİNİN TANIMLANMASI / IDENTIFICATION OF TEST SAMPLE

Ürün kodu / Product code : MXVR örnek 1 / sample 1
Ürün fonksiyonu / Function of the ESA : NVR kamera ile sistem / system with camera,
Bağışıklıkla ilgili fonksiyon içeriyor mu? / Regarded as immunity related? : Hayır / No
Gövdenin ana malzemesi / Primary material(s) of the body : Alüminyum / Aluminum
Elektrik sistemi gerilimi ve topraklama / Electrical system voltage and ground : 12, negatif zemin / negative ground
REESS için bağlantı içeriyor mu? / Provides coupling system for REESS? : Hayır / No

6. GEREKLİLİKLER VE TEST SONUÇLARI / REQUIREMENTS AND TEST RESULTS

6.1. GENEL / GENERAL

Regülasyon Eki / Annex of the Regulation	Başlık / Title	Sonuç / Result
7	Yayınlan genişband elektromanyetik emisyonlar / Radiated broadband electromagnetic emissions	Uygundur / In conformity
8	Yayınlan darband elektromanyetik emisyonlar / Radiated narrowband electromagnetic emissions	Uygundur / In conformity
9	Elektromanyetik radyasyonuna karşı bağışıklık / Immunity to electromagnetic radiation	Uygulanmaz / Not applicable
10	Güç hattı üzerinden emisyon ve bağışıklık / Immunity to and emission of transients	Uygundur / In conformity
17	AC güç hattından yayılan harmonik emisyonları / Emission of harmonics generated on AC power lines	Uygulanmaz / Not applicable
18	AC güç hattından yayılan voltaj değişikliği, voltaj dalgalanmaları ve kırışma emisyonları / Emission of voltage changes, voltage fluctuations and flicker on AC power lines	Uygulanmaz / Not applicable
19	AC ve/veya DC güç hatlarından yayılan RF iletimli gürültü emisyonları / Emission of radiofrequency conducted disturbances on AC or DC power lines	Uygulanmaz / Not applicable
20	Şebeke ve telekomünikasyon bağlantılarından RF iletimli gürültü emisyonları / Emission of radiofrequency conducted disturbances on network and telecommunication access	Uygulanmaz / Not applicable
21	AC ve DC güç hatlarından gelen EFT/B gürültülerine karşı bağışıklığı / Immunity to Electrical Fast Transient/Burst disturbances conducted along AC and DC power lines	Uygulanmaz / Not applicable
22	AC ve DC güç hatlarından gelen kırışmalara karşı bağışıklığı / Immunity to surges conducted along AC and DC power lines	Uygulanmaz / Not applicable

6.2. DETAYLAR / DETAILS

[6.1.2.][7.1.2.] Testlerden önce Teknik Servis imalatçı ile birlikte en azından operasyon şartları, uyarıcı fonksiyonlar, gözlemlenen fonksiyonlar, geçme/kalma kriterleri ve amaçlanan emisyonları içeren bir test planı oluşturmaktır. / *Before testing the Technical Service has to prepare a test plan in conjunction with the manufacturer, which contains at least mode of operation, stimulated function(s), monitored function(s), pass/fail criterion(criteria) and intended emissions.*

Uygundur / In conformity

En kritik koşul seçimi / *Worst case selection* : Uygulanmaz / *Not applicable*

Normal çalışma durumu / *Normal operating condition(s)* : NVR video camera kayıt / *NVR recording camera video*

Bağıışıklık testi için hata modu / *Failure criteria for immunity tests* : Uygulanmaz / *Not applicable*

Ek 7 – Yayınlan genişband elektromanyetik emisyonlar / Annex 7 - Radiated broadband electromagnetic emissions

Dedektör tipi / *Type of detector* : peak

Yerleşim detayı ve referans çizgisi / *Testing configuration and reference line(s)* : Giriş çıkış portu antene bakacak şekilde ve kamera bağlı sabitlendi / *Output and input port fixed facing to the antenna while a camera connected*

[2.] Test sırasında ESA durumu / *ESA state during tests*

[2.1.] ESA normal çalışma modunda tercihen maksimum yükte test edilmelidir. / *The ESA under test shall be in normal operation mode, preferably in maximum load.*

Uygundur / In conformity

“REESS şarj modunda güç hattına bağlı” durum haricinde / *ESA in configuration other than "REESS in charging mode coupled to the power grid"*

Uygulanmaz / Not applicable

“REESS şarj modunda güç hattına bağlı” durum için / *ESA in configuration "REESS in charging mode coupled to the power grid"*

Uygulanmaz / Not applicable

Çekiş enerjisi sağlayan akünün yükü tüm test boyunca maksimum şarj durumunun (SOC) %20-%80 aralığında olmalıdır. Akım sabitlenebilirse, nominal değerinin en az %80'ine sabitlenmelidir. /

The state of charge (SOC) of the traction battery shall be kept between 20% and 80% of the maximum SOC during the whole frequency range measurement (this may lead to split the measurement into different sub-bands with the need to discharge the vehicle's traction battery before starting the next sub-bands). If the current consumption can be adjusted, then the current shall be set to at least 80% of its nominal value.

[3.1.] Şarj modu haricindeki ESA testleri için CISPR 25, paragraf 6.4.'te belirtilen ALSE metoduna göre test gerçekleştirilmelidir. / *For ESA other than involved in "REESS charging mode coupled to the power grid" the test shall be performed according to the ALSE method described in Paragraph 6.4. of CISPR 25.*

Uygundur / In conformity

[3.2.] Şarj modu için İlave 7, Figür 2'ye göre testler gerçekleştirilmelidir. / *For ESAs in configuration "REESS charging mode coupled to the power grid" the test arrangement shall be according to Figure 2 of the appendix to Annex 7.*

Uygulanmaz / Not applicable

[3.3.] ALSE metoduna alternatif olarak CISPR 16-1-4'e uygun olarak açık saha testi metodu (OATS) uygulanabilir. / As an alternative to an absorber lined shielded enclosure (ALSE) an open area test site (OATS), which complies with the requirements of CISPR 16-1-4 may be used (see Appendix to this Annex).

Uygulanmaz / Not applicable

[4.3.] Ölçümler alttaki parametreler dikkate alınarak spektrum analizörü veya tarayıcı alıcı kullanılarak yapılmalıdır. / The measurements shall be performed with a spectrum analyser or a scanning receiver with the parameters given below:

Uygundur / In conformity

Ölçüm cihazı / Measurement device:

☐ Spektrum analizörü / Spectrum analyser

☒ Tarayıcı alıcı / Scanning receiver

Spectrum Analyser Parameters

Frequency range MHz	Peak detector		Quasi-peak detector		Average detector	
	RBW at -3dB	Scan time	RBW at -6dB	Scan time	RBW at -3dB	Scan time
30 to 1,000	100/120kHz	100ms/MHz	120kHz	20s/MHz	100/120kHz	100ms/MHz

Note: If a spectrum analyser is used for peak measurements, the video bandwidth shall be at least three times the resolution bandwidth (RBW).

Scanning Receiver Parameters

Frequency range MHz	Peak detector			Quasi-peak detector			Average detector		
	BW at -6dB	Step size ^(a)	Dwell time	BW at -6dB	Step size ^(a)	Dwell time	BW at -6dB	Step size ^(a)	Dwell time
30 to 1,000	120Hz	50kHz	5ms	120Hz	50kHz	1s	120kHz	50kHz	5ms

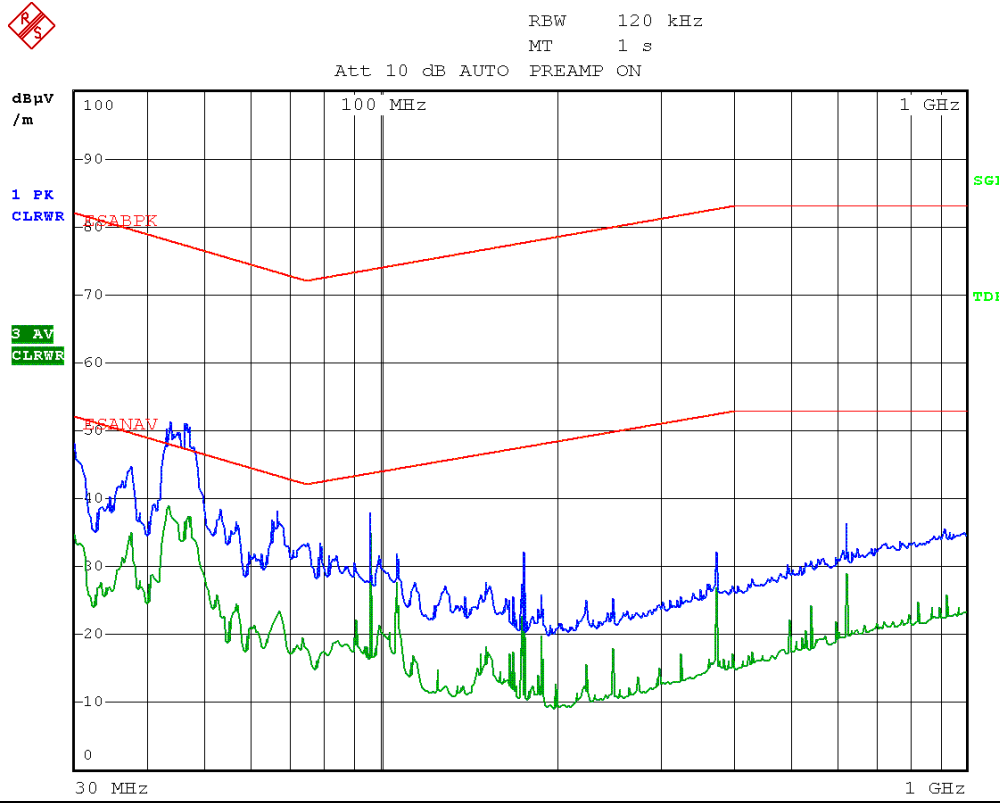
^(a) For purely broadband disturbances, the maximum frequency step size may be increased up to a value not greater than the bandwidth value.

Note: For emissions generated by brush commutator motors without an electronic control unit, the maximum step size may be increased up to five times the bandwidth.

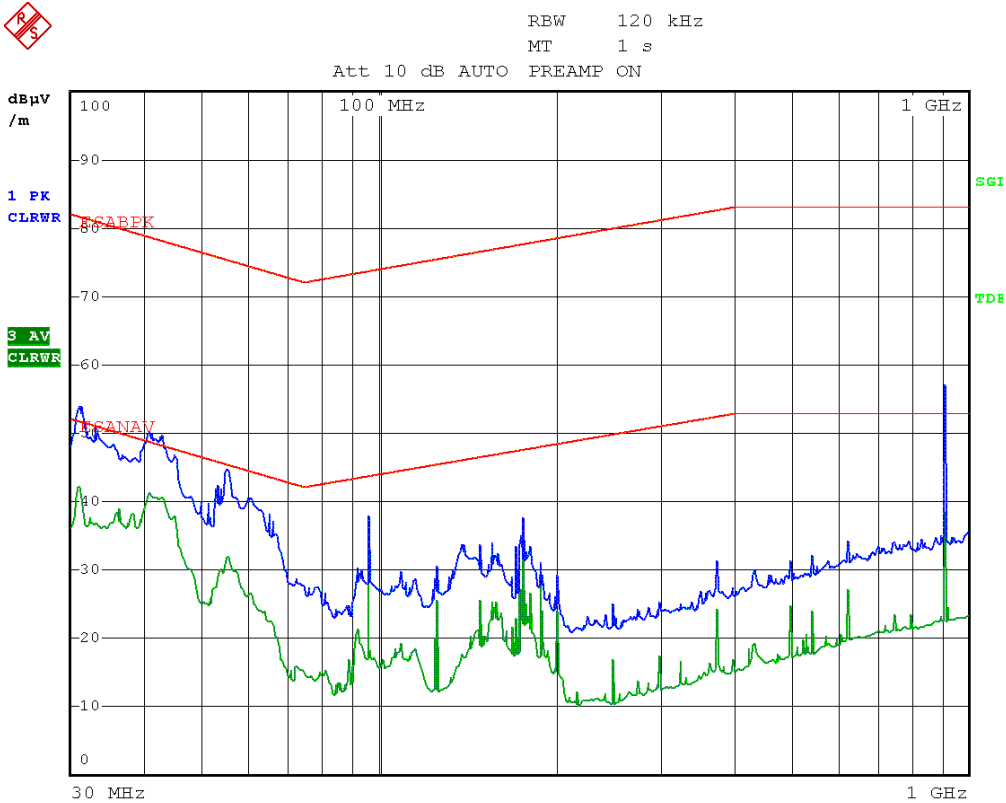
[4.5.] Ölçümler / Readings

"REESS şarj modunda güç hattına bağlı" durum haricinde / In configuration other than "REESS in charging mode coupled to the power grid"

Frekans bandları / Frequency bands	Frekans / Frequency	Polarizasyon / Polarization	Ölçüm / Characteristic reading	Sınır değer / Limit
MHz	MHz	H: yatay / horizontal V: dikey / vertical	dB µV/m	dB µV/m
30-34	Ölçüm sonuçları için aşağıdaki grafik 1 ve grafik 2'nin mavi çizgisine bakınız. / Refer to blue line of Graph 1 and Graph 2 below regarding result of measurement.			
34-45				
45-60				
60-80				
80-100				
100-130				
130-170				
170-225				
225-300				
300-400				
400-525				
525-700				
700-850				
850-1000				



Grafik 1: Genişbant yayılımı EM (mavi) and darbant yayılımı EM (yeşil), polarizasyon: dikey
Graph 1: Radiated broadband EM (blue) and radiated narrowband EM (green), polarization: vertical



Grafik 2: Genişbant yayılımı EM (mavi) and darbant yayılımı EM (yeşil), polarizasyon: yatay/
Graph 2: Radiated broadband EM (blue) and radiated narrowband EM (green), polarization: horizontal

Ek 8 - Yayınlan darband elektromanyetik emisyonlar / Annex 8 -Radiated narrowband electromagnetic emissions

Dedektör tipi / Type of detector : averaj / average

Yerleşim detayı ve referans çizgisi / Testing : Giriş çıkış portu antene bakacak şekilde ve kamera bağlı sabitlendi /
configuration and reference line(s) : Output and input port fixed facing to the antenna while a camera connected

[2.]Test sırasında ESA durumu / ESA state during tests

[2.1.] ESA normal çalışma modunda tercihen maksimum yükte test edilmelidir. / The ESA under test shall be in normal operation mode, preferably in maximum load.

Uygundur / In conformity

[3.1.] CISPR 25, paragraf 6.4.'te belirtilen ALSE metoduna göre test gerçekleştirilmelidir. / The test shall be performed according to the ALSE method described in Paragraph 6.4. of CISPR 25.

Uygundur / In conformity

[3.2.] ALSE metoduna alternatif olarak CISPR 16-1-4'e uygun olarak açık saha testi metodu (OATS) uygulanabilir. / As an alternative to an absorber lined shielded enclosure (ALSE) an open area test site (OATS), which complies with the requirements of CISPR 16-1-4 may be used (see Appendix to this Annex).

Uygulanmaz / Not applicable

[4.3.] Ölçümler alttaki parametreler dikkate alınarak spektrum analizörü veya tarayıcı alıcı kullanılarak yapılmalıdır. / The measurements shall be performed with a spectrum analyser or a scanning receiver with the parameters given below:

Uygundur / In conformity

Ölçüm cihazı / Measurement device:

☐ Spektrum analizörü / Spectrum analyser

☒ Tarayıcı alıcı / Scanning receiver

Spectrum Analyser Parameters

Frequency range MHz	Peak detector		Quasi-peak detector		Average detector	
	RBW at -3dB	Scan time	RBW at -6dB	Scan time	RBW at -3dB	Scan time
30 to 1,000	100/120kHz	100ms/MHz	120kHz	20s/MHz	100/120kHz	100ms/MHz
Note: If a spectrum analyser is used for peak measurements, the video bandwidth shall be at least three times the resolution bandwidth (RBW).						

Scanning Receiver Parameters

Frequency range MHz	Peak detector			Quasi-peak detector			Average detector		
	BW at -6dB	Step size ^(a)	Dwell time	BW at -6dB	Step size ^(a)	Dwell time	BW at -6dB	Step size ^(a)	Dwell time
30 to 1,000	120Hz	50kHz	5ms	120Hz	50kHz	1s	120kHz	50kHz	5ms
^(a) For purely broadband disturbances, the maximum frequency step size may be increased up to a value not greater than the bandwidth value.									
Note: For emissions generated by brush commutator motors without an electronic control unit, the maximum step size may be increased up to five times the bandwidth.									

[3.5.] Ölçümler/Readings

Frekans bandları / Frequency bands	Frekans / Frequency	Polarizasyon / Polarization	Ölçüm / Characteristic reading	Sınır değeri / Limit
MHz	MHz	H: yatay / horizontal V: dikey / vertical	dB µV/m	dB µV/m
30-34	Ölçüm sonuçları için yukarıdaki grafik 1 ve grafik 2'nin yeşil çizgisine bakınız. / Refer to green line of Graph 1 and Graph 2 above regarding result of measurement.			
34-45				
45-60				
60-80				
80-100				
100-130				
130-170				
170-225				
225-300				
300-400				
400-525				
525-700				
700-850				
850-1000				

Ek 9 - Elektromanyetik radyasyonuna karşı bağışıklığı / Annex 9 - Immunity to electromagnetic radiation

Not applicable

Ek 10 - Güç hattı üzerinden emisyon ve bağışıklık Annex 10 - Immunity to and emission of transients

[ISO 7637-2, 4.2.] Çevre sıcaklığı 23 ±5°C aralığında olmalıdır. / The ambient temperature during the test shall be 23 ±5°C.

Uygundur / In conformity

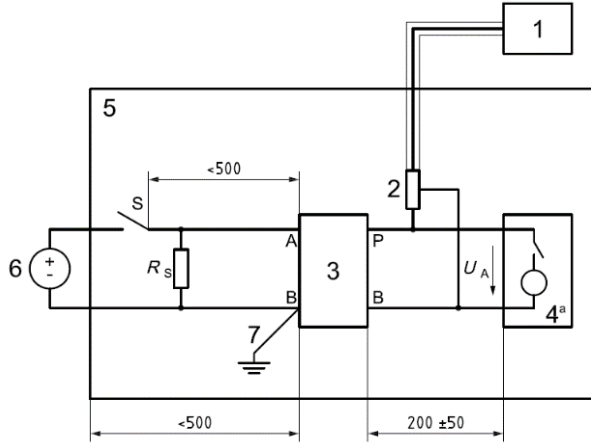
[Genel Bölüm, 6.7.] ESA Tarafından Üretilen Kablo Üzerinden İletilen Geçici Bozulma Emisyonları / Emission of Transient Conducted Disturbances Generated by ESAs

[Genel Bölüm, 6.10.5.] Anahtarlanmayan, anahtar içermeyen veya endüktif yüke sahip olmayan ESAlar için geçici iletilen emisyon testi uygulanmasına gerek yoktur ve bunların Paragraf 6.7.'yi sağladığı değerlendirilir. / ESAs that are not switched, contain no switches or do not include inductive loads need not be tested for transient conducted emission and shall be deemed to comply with Paragraph 6.7.

Uygulanmaz / Not applicable

[ISO 7637-2, 4.3.2.] Yavaş sinyaller için test düzeneği aşağıdaki gibi olmalıdır. / Test set-up for slow pulses shall be in line with the figure below.

Uygundur / In conformity



Key

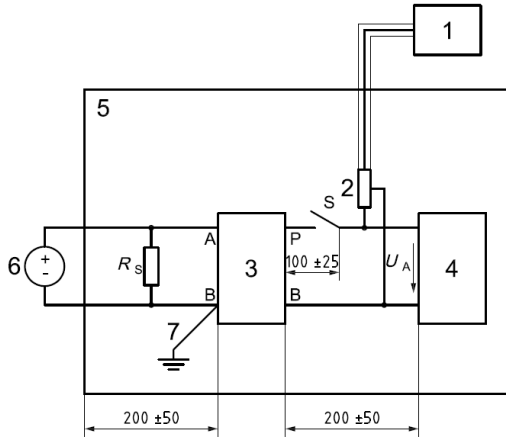
- 1 oscilloscope or equivalent
- 2 voltage probe
- 3 artificial network
- 4 DUT (source of transient)
- 5 ground plane
- 6 power supply
- 7 ground connection; length <100 mm
- R_s shunt resistance, as specified in 5.2
- S switch, as specified in 5.3
- U_A supply voltage

NOTE For A, B, and P, see Figure 3.

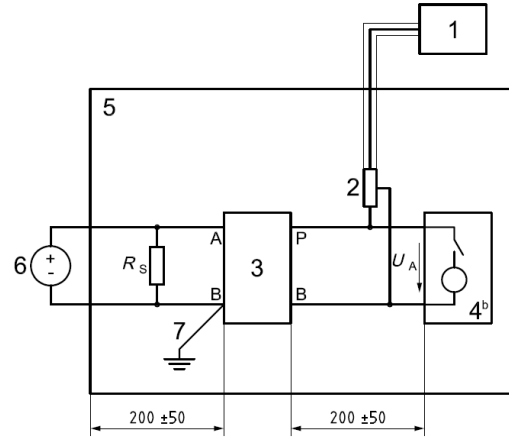
- a Optionally with internal switch driving inductive load.
- b With internal load and switch.

[ISO 7637-2, 4.3.3.] Hızlı sinyaller için test düzeneği aşağıdaki gibi olmalıdır. / Test set-up for fast pulses shall be in line with the related figure below.

Uygundur / In conformity



Transient emission test set-up to measure fast pulses (ns to µs range) for DUT without internal switch



Transient emission test set-up to measure fast pulses (ns to µs range) for DUT with internal switch

[Genel Bölüm, 6.7.1.] Pozitif ve negatif, 12V ve/veya 24V sistemler, yavaş ve hızlı sinyaller için ölçüm değerleri limit değerlerin altında olmalıdır. / Measurement results for positive and negative, 12V and/or 24V system(s), slow and fast pulses shall be less than the limit values.

Uygundur / In conformity

	12 V system					24 V system		
	Slow pulse		Fast pulse		Limit	Slow pulse	Fast pulse	Limit
Positive(OFF to ON)	14	14	14	14	+75 V	Uygulanmaz / Not applicable		+150 V
Negative(On to OFF)	0.4	0.2	-7.8	-7.8	-100 V			-450 V

[Genel Bölüm, 6.9.] ESAların Geçici Darbelere Karşı Bağışıklığı / Immunity of ESAs to Transient Disturbances

[2.] 1, 2a, 2b, 3a, 3b ve 4 darbeleri uygulanmalıdır. 1, 2a, 2b, 3a, 3b darbeleri için ISO 7637-2'ye, 4 darbesi için ISO 16750-2'ye bakınız. / *Test pulses 1, 2a, 2b, 3a, 3b and 4 shall be applied. Refer to ISO 7637-2 for pulses 1, 2a, 2b, 3a and 3b; refer to ISO 16750-2 for pulse 4.*

Uygundur / In conformity

[ISO 7637-2, 4.4.] Test düzeni ISO 7637-2 ile uyumlu olmalıdır. / *Test set-up shall be in line with ISO 7637-2.*

Uygundur / In conformity

Besleme gerilimi (U_A) darbe jeneratörü çıkışında ölçülmeli ve 12V sistem için $13,5 \pm 0,5V$, 24V sistem için $27 \pm 1 V$ olmalıdır. / *Supply voltage (U_A), shall be measured at the output of the pulse generator and shall $13,5 \pm 0,5V$ for nominal 12 V system and $27 \pm 1 V$ for nominal 24 V system.*

Uygundur / In conformity

Test pulse	Immunity level	Functional status of the systems			
		Related to immunity related functions		Not related to immunity related functions	
		Observation	Criteria	Observation	Criteria
1	III	Uygulanmaz / Not applicable	C	B	D
2a	III		B	A	D
2b	III		C	B	D
3a	III		A	A	D
3b	III		A	A	D
4	III		B / C	B	D

Ek 17 - AC güç hattından yayılan harmonik emisyonları / Annex 17 - Emission of harmonics generated on AC power lines

Not applicable

Ek 18 - AC güç hattından yayılan voltaj değişikliği, voltaj dalgalanmaları ve kırpışma emisyonları / Annex 18 - Emission of voltage changes, voltage fluctuations and flicker on AC power lines

Not applicable

Ek 19 – Bir ESA'dan gelen AC veya DC güç hatlarında radyofrekans kaynaklı bozukluklar / Annex 19 - Emission of radiofrequency conducted disturbances on AC or DC power lines from an ESA

Not applicable

Ek 20 – Radyofrekans emisyonu, bir ESA'dan ağ ve telekomünikasyon erişiminde rahatsızlıklar / Annex 20 - Emission of radiofrequency conducted disturbances on network and telecommunication access from an ESA

Not applicable

Annex 21 – Bir ESA'nın AC ve DC güç hatları boyunca gerçekleştirilen Elektriksel Hızlı Geçici / Patlama bozulmalarına karşı bağışıklığı. / Annex 21 - Immunity of an ESA to Electrical Fast Transient/Burst disturbances conducted along AC and DC power lines

Not applicable

Annex 22 – AC ve DC güç hatları boyunca gerçekleştirilen ESA'ların Dalgalanmalara Bağışıklığı / Annex 22 - Immunity of ESAs to Surges conducted along AC and DC power lines

Not applicable

7. SONUÇ VE UYGUNLUK DURUMU / CONCLUSION AND STATEMENT OF CONFORMITY

Yukarıda madde 1.1.'de bahsedilen üretici bilgi dökümanı ve araç tipi BM/AEK Regülasyon No.10'un gerekliliklerini karşılar. / The above mentioned information document in item 1.1. and the vehicle type meet the requirements of UNECE Regulation No. 10.

Notlar / Remarks: Testler NVR cihazı videoya kayıt yaparken ve kameraya bağlıyken gerçekleştirildi. Tüm testleri başarıyla geçti.

ESA'nın işlevi NVR kamera kaydıdır ve sürüşle ilgili değildir. Bu nedenle bağışıklıkla ilgili işlevlerin bu yönetmeliğin 6.10.3. maddesine göre radyasyonlu bozulmalara karşı bağışıklık açısından test edilmesine gerek yoktur. Teknik bir itiraz yoktur. /

The tests performed while NVR device recording to video and connected the camera. All test passed successfully.

ESA function is NVR camera recording and it is not related driving. Therefore with no immunity related functions need not be tested for immunity to radiated disturbances as per item 6.10.3. of this regulation. There is no technical objection.

Yetkili uzman
Authorized expert
Barış Tüyünöklü

İçerik kontrolü yapan
Content check by
Özlem Özer



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R10.06

Information document for type approval of an electric/electronic sub-assembly with respect to electromagnetic compatibility

No : SM-2504-00
Date : 14/03/2025

1. Make (trade name of manufacturer): Movita
2. Type: MNVR, IP Kamera
- 2.1 Version (s) / Variant (s) N.A.
- 2.2 Commercial Name (s) MXVR, Movita IP-W, Movita IP-B
3. Means of identification of type, if marked on the component/separate technical unit: N.A.
- 3.1. Location of that marking: N.A.
4. Name and address of manufacturer: SMARTEQ BİLİŞİM VE İLETİŞİM TEK. SAN. VE TİC. LTD. ŞTİ.
Macun Mahallesi Batı Bulvarı 177. Cadde Batı İş Merkezi No:28/66 Yenimahalle/Ankara
- 4.1. Name and address of authorized representative, if any: with the stich label on the body, see annex 1
5. In the case of components and separate technical units, location and method of affixing of the approval mark:
6. Address(es) of assembly plant(s): Macun Mahallesi Batı Bulvarı 177. Cadde Batı İş Merkezi No:28/66 Yenimahalle/Ankara
7. This ESA shall be approved as a component/STU: Component
8. Any restrictions of use and conditions for fitting: N.A.
9. Electrical system rated voltage: 12 V negative ground

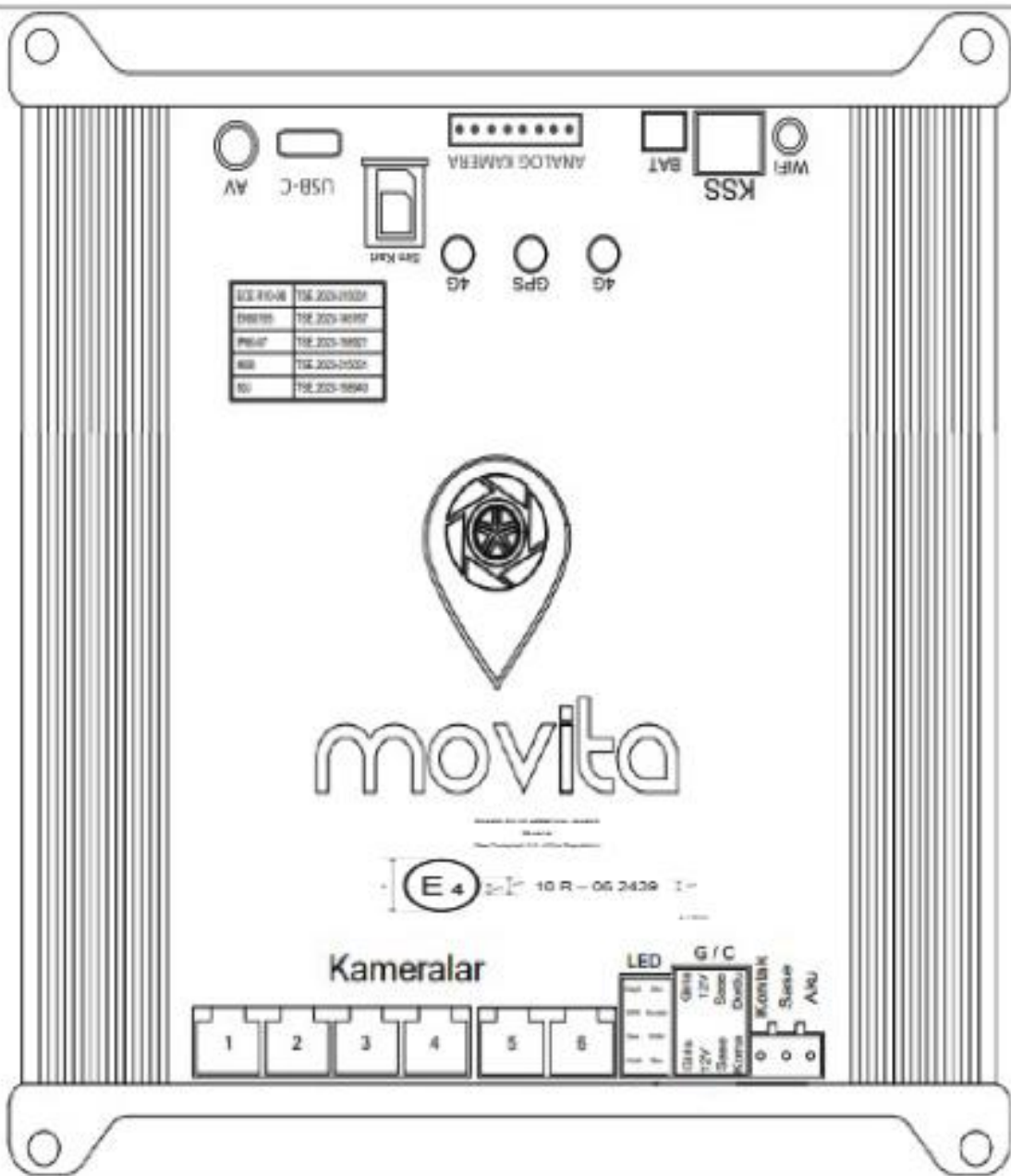
Appendix 1	Description of the ESA chosen to represent the type (electronic block diagram and list of main component constituting the ESA (e.g. make and type of microprocessor, crystal, etc.))	See Annexes.
Appendix 2	Relevant test report(s) supplied by the manufacturer from a test laboratory accredited to ISO 17025 and recognized by the Type Approval Authority for the purpose of drawing up the type approval certificate	N.A.

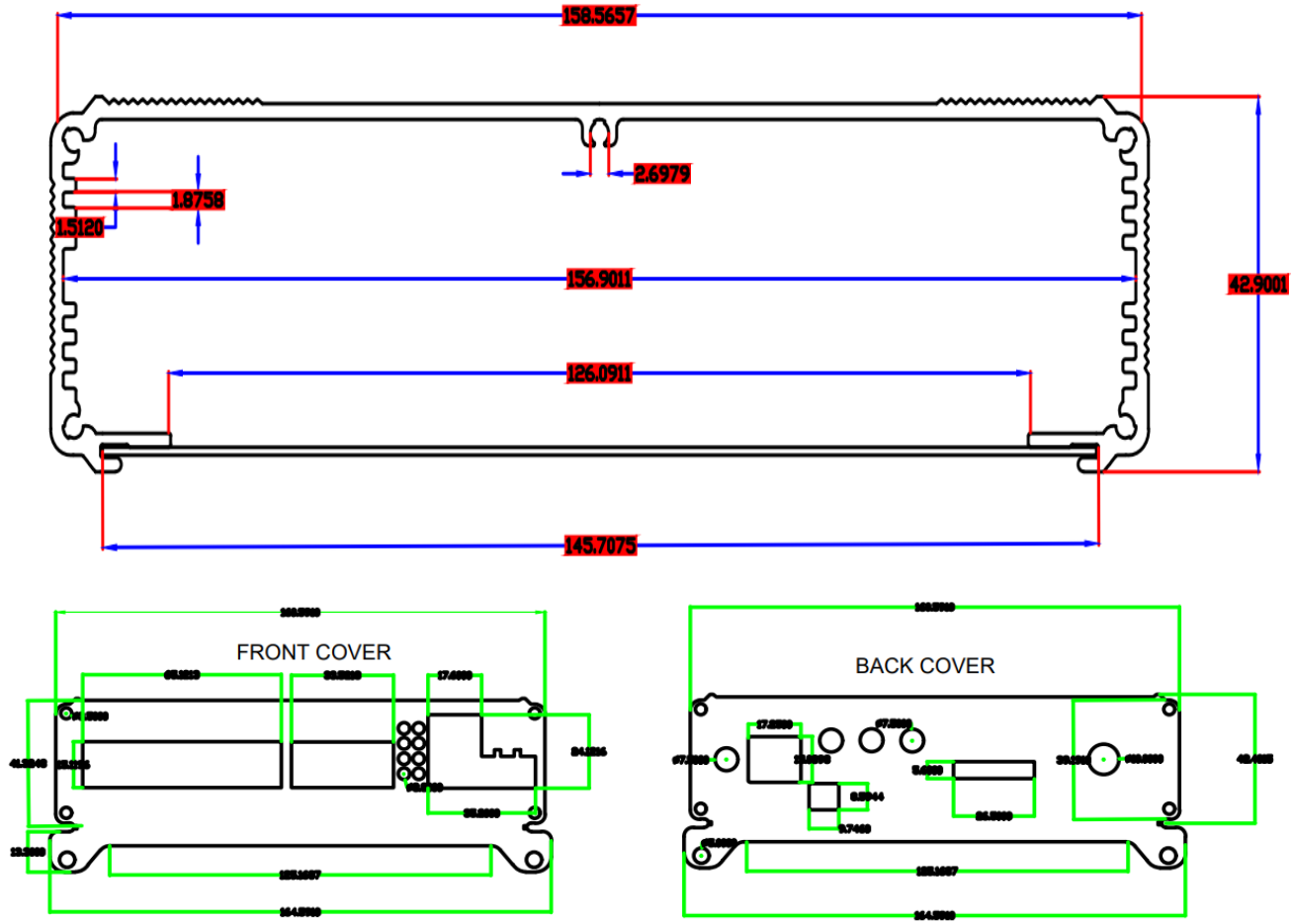
Only applicable for charging systems:

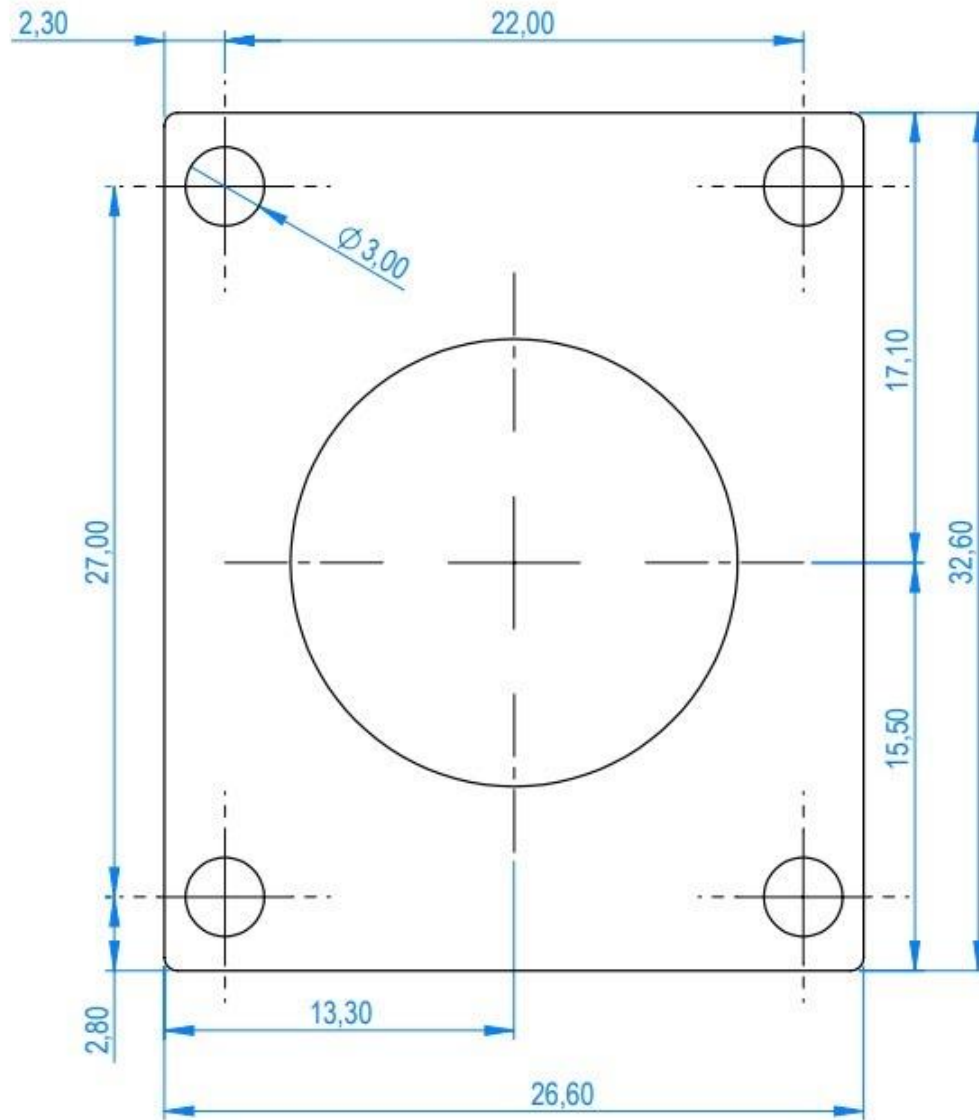
- | | | |
|-----|---|------|
| 10. | Charger: on board/external | N.A. |
| 11. | Charging current: direct current/alternating current (number of phases/frequency) | N.A. |
| 12. | Maximal nominal current (in each mode if necessary) | N.A. |
| 13. | Nominal charging voltage | N.A. |
| 14. | Basic ESA interface functions: ex. L1/L2/L3/N/PE/control pilot | N.A. |
| 15. | Minimum R_{sce} value (see paragraph 7.11. of this Regulation) | N.A. |

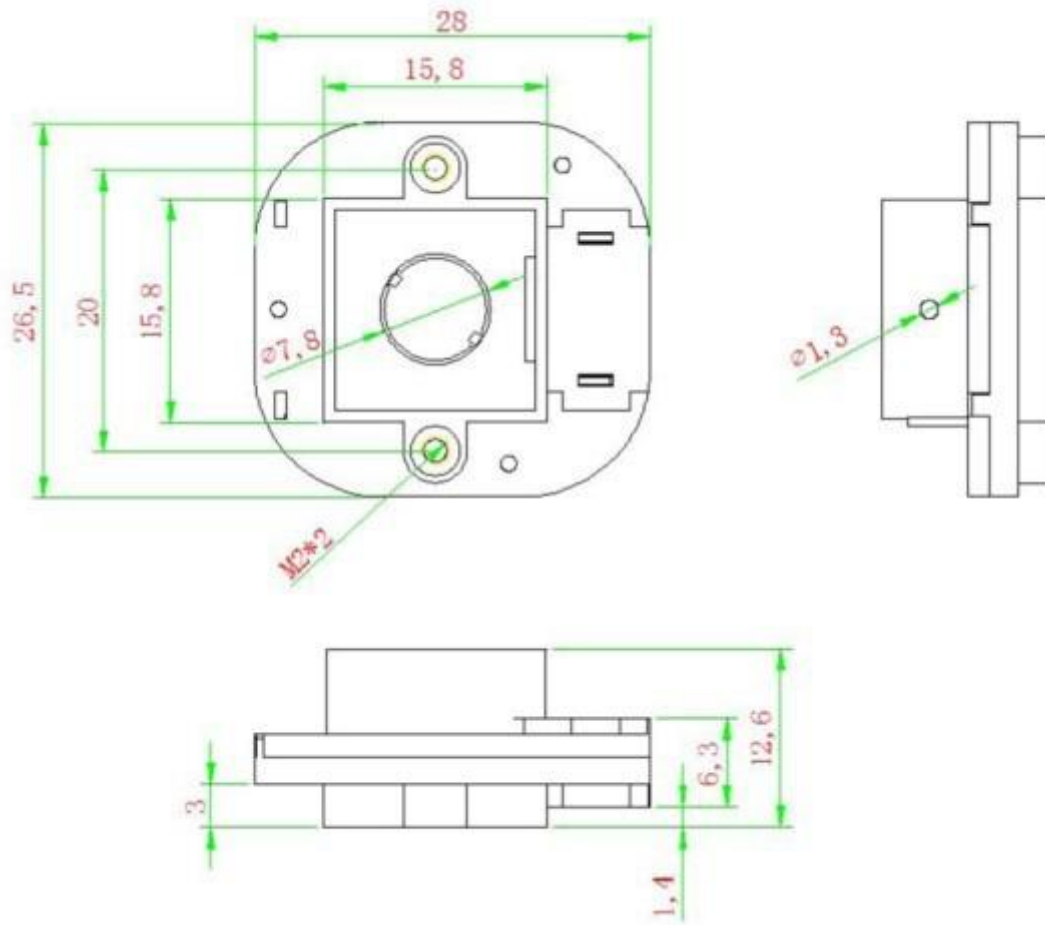
List of Annexes:

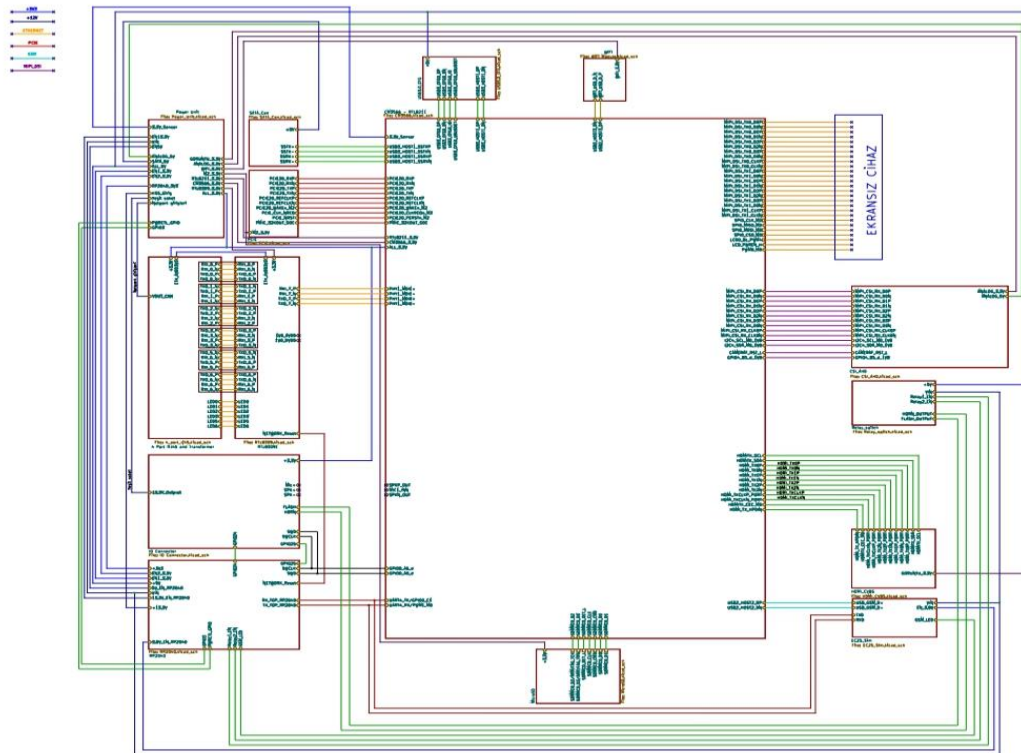
Annex	Description	Page(s)
1.	Technical Drawings, approval number location	4
2.	Circuit drawings	8
3.	PCB Layout (all of layer)	10
4.	Electronic components list	5



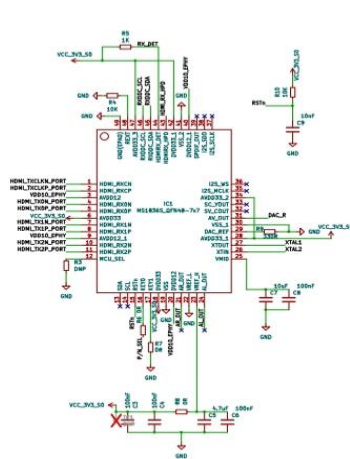








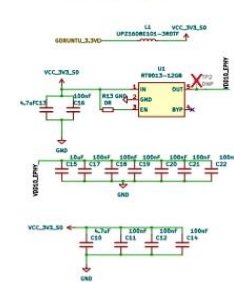
MS1836



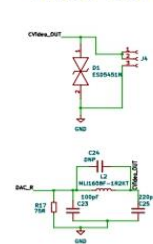
CONNECTIONS

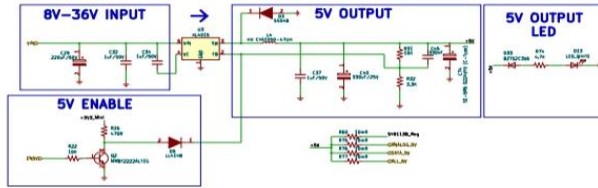
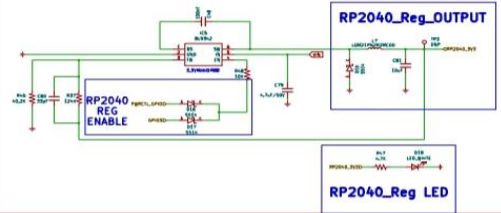
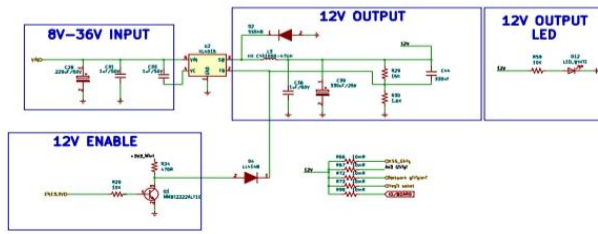
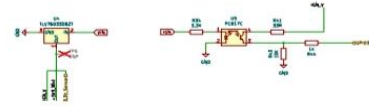
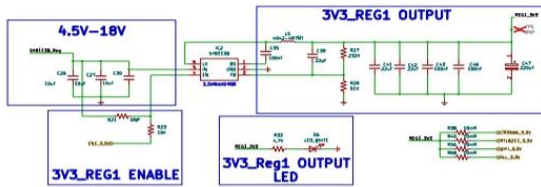
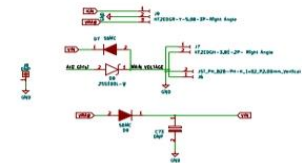
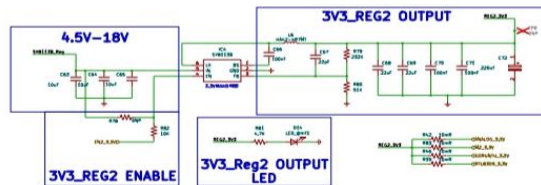


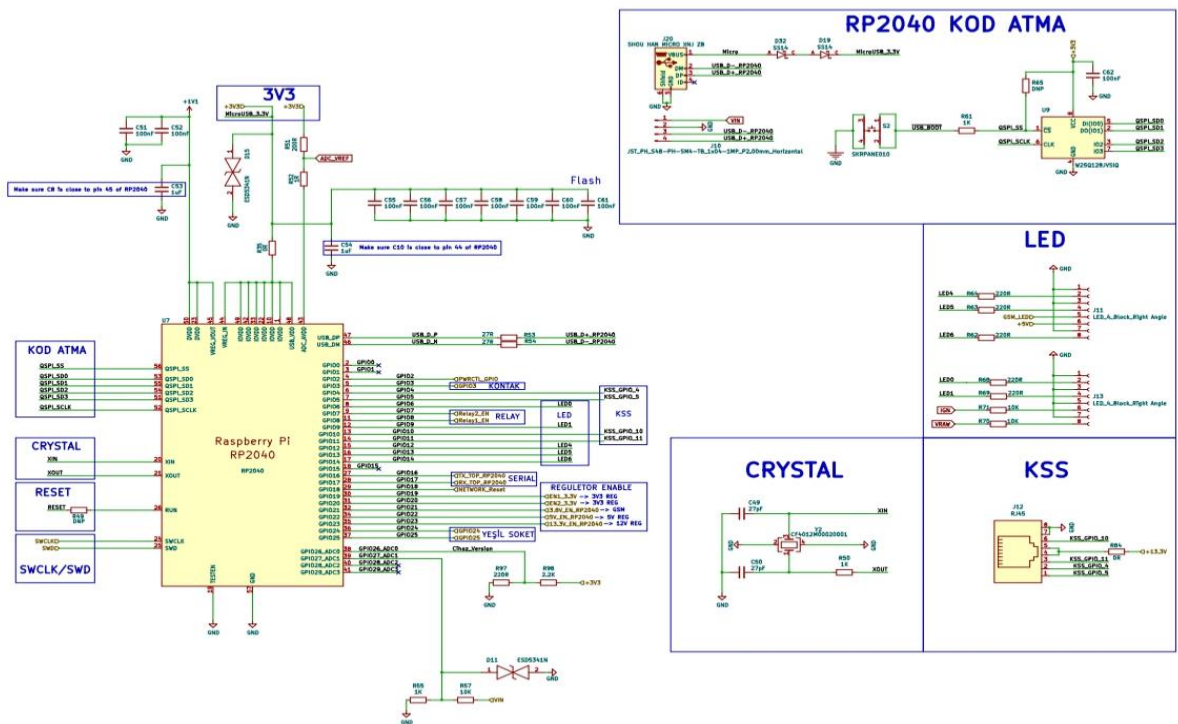
POWER UNIT

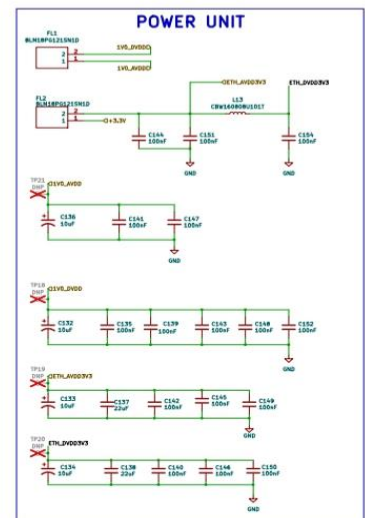
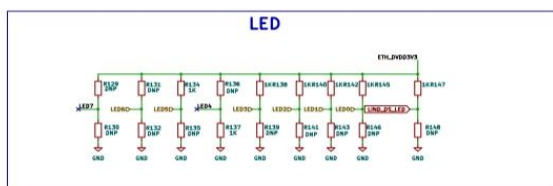


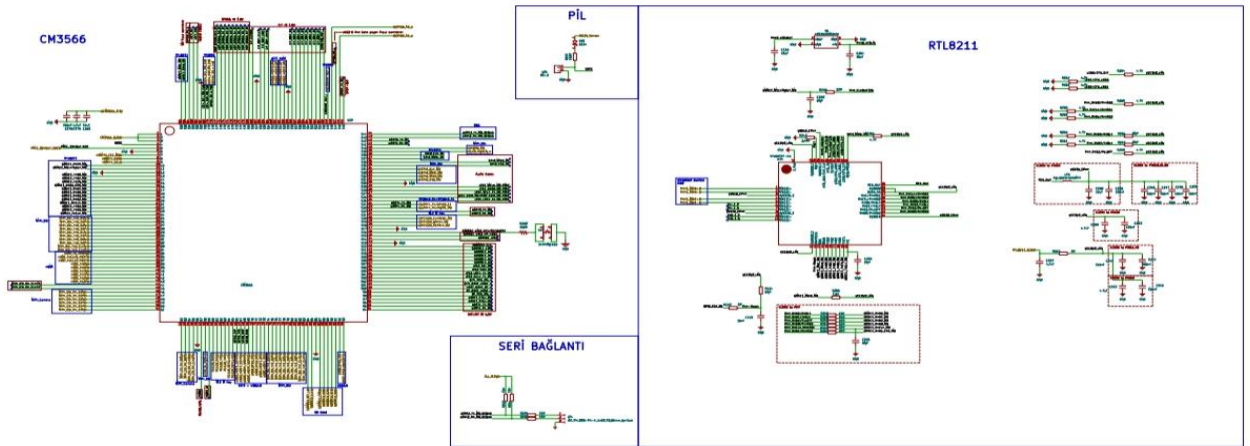
VIDEO OUT



5V REG**RP2040 AÇMA****12V REG****KONTAK****3V3 REG****AKÜ VE ANA GİRİŞ****3V3 REG**

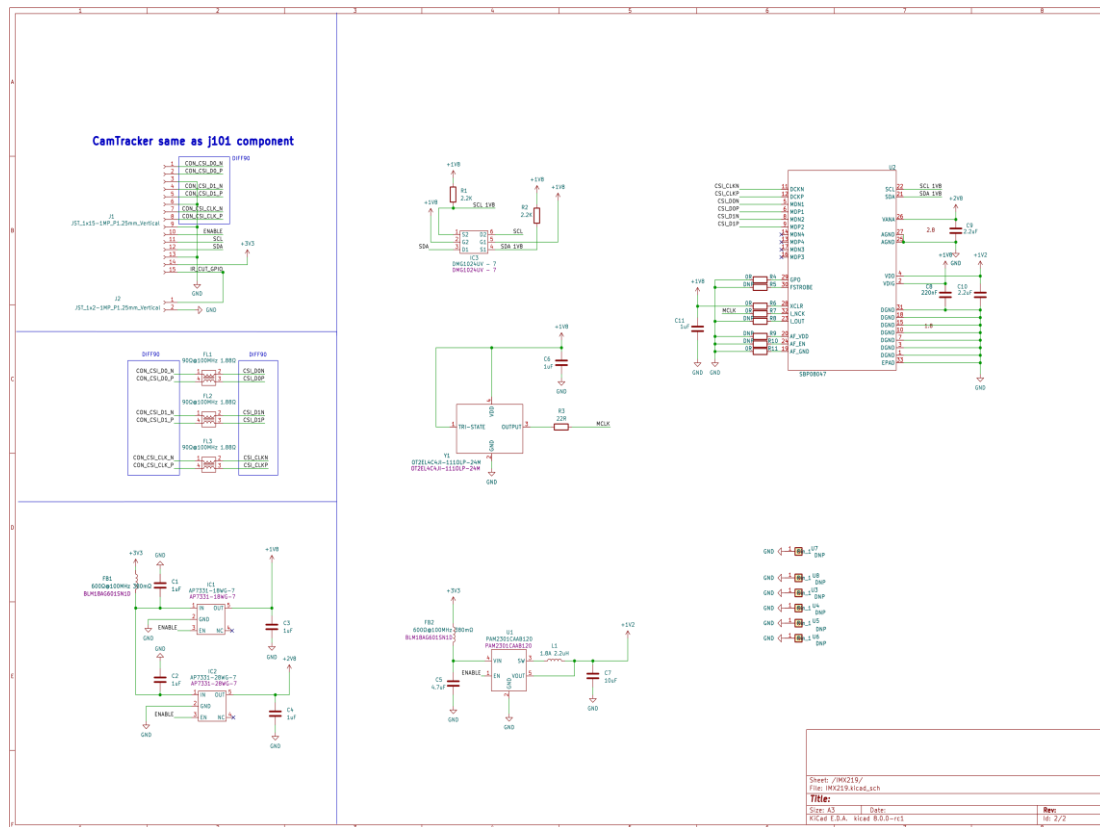


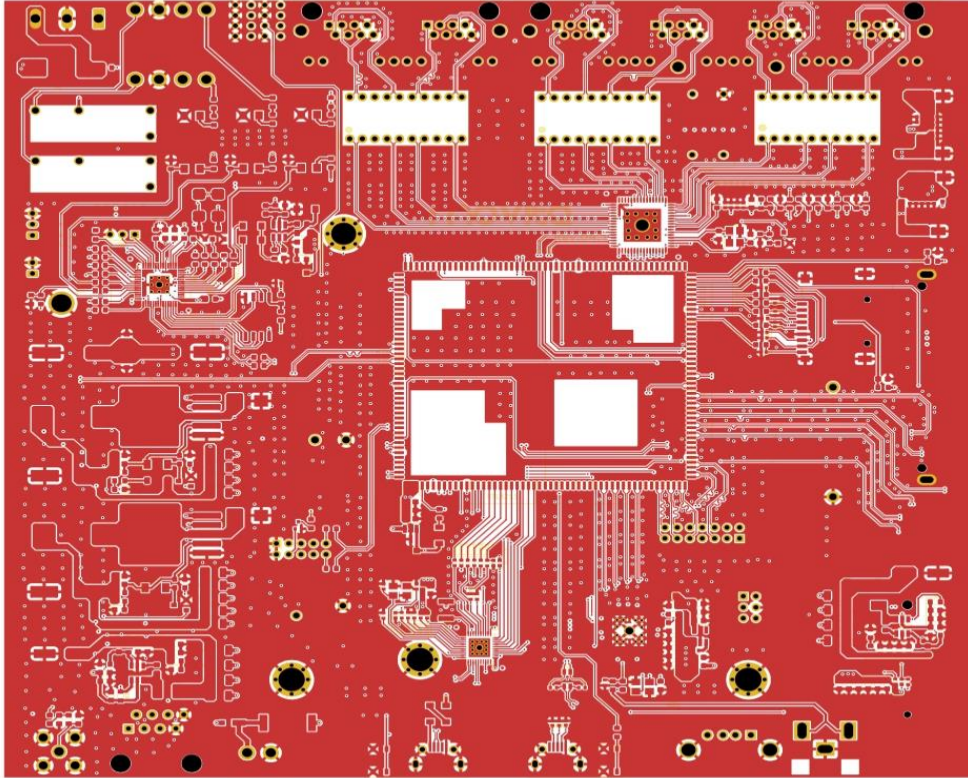


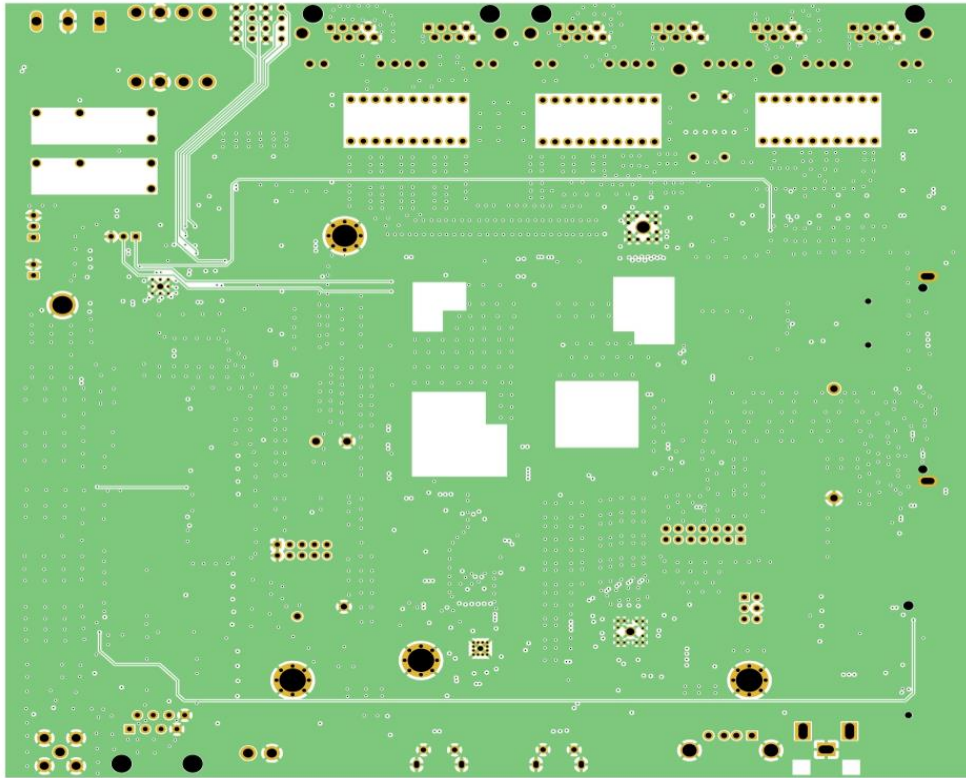


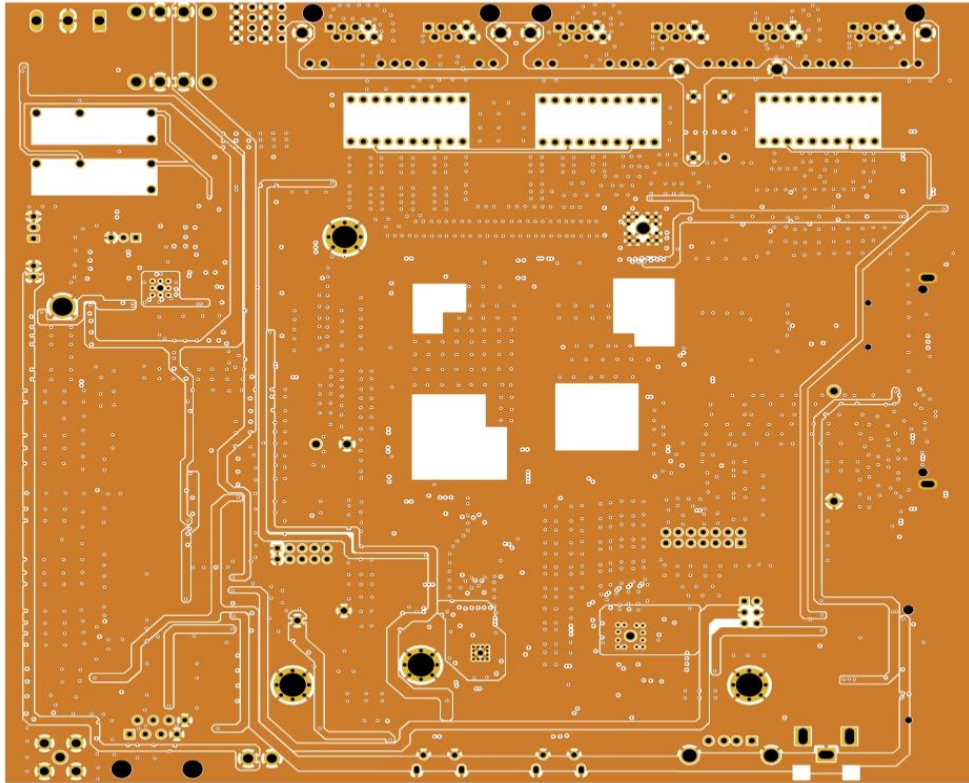


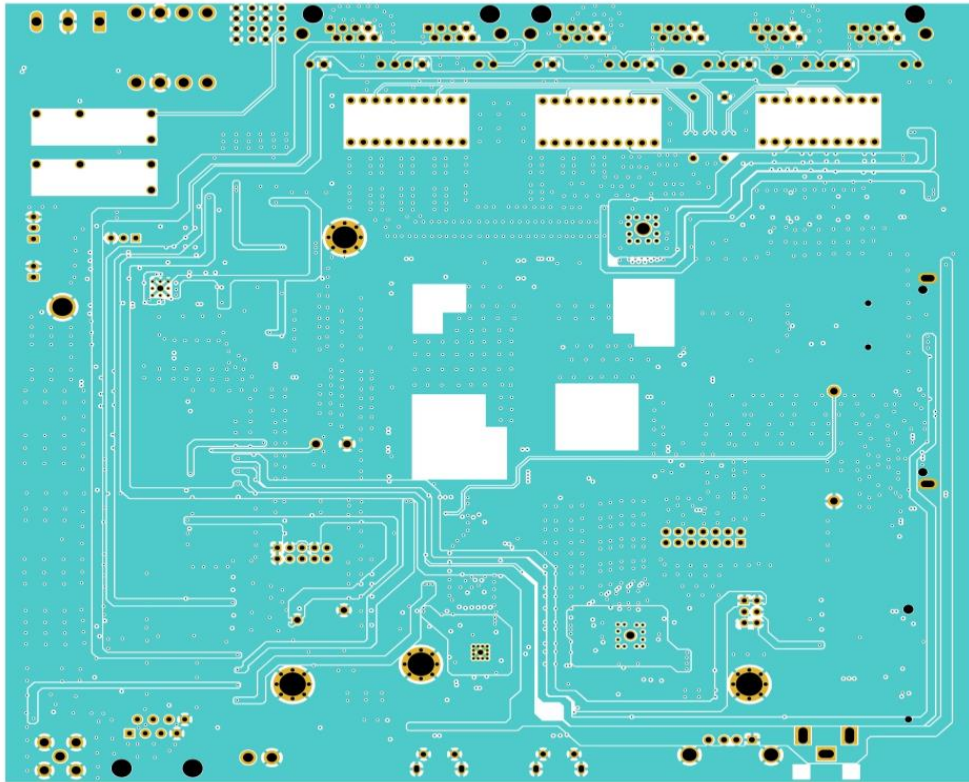
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B														
C														
D														
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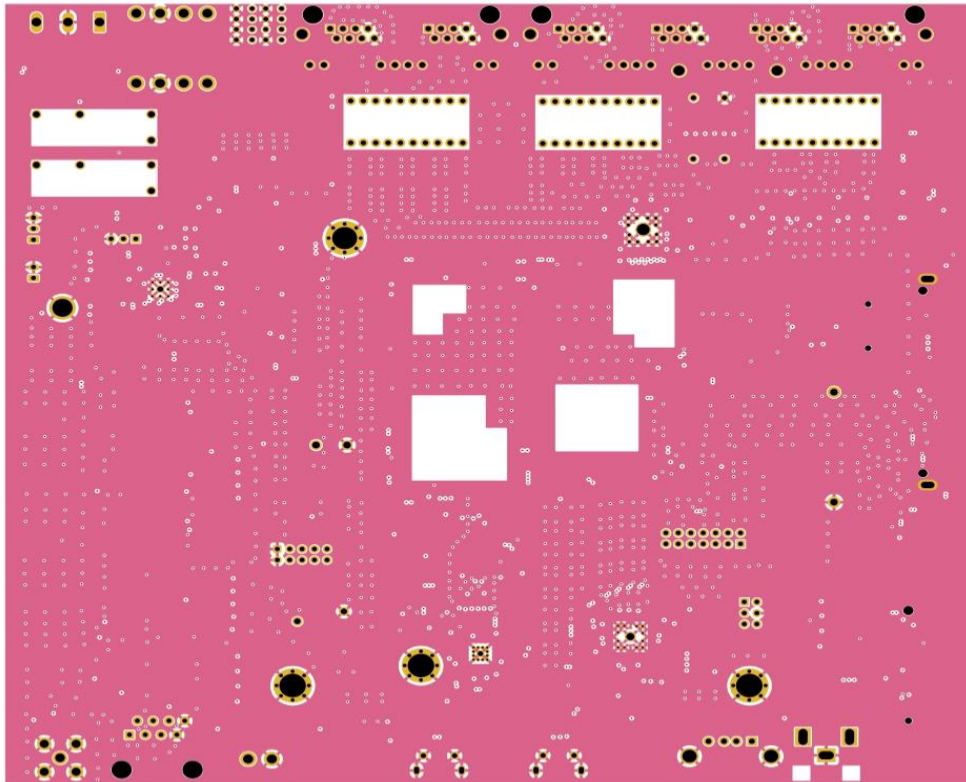


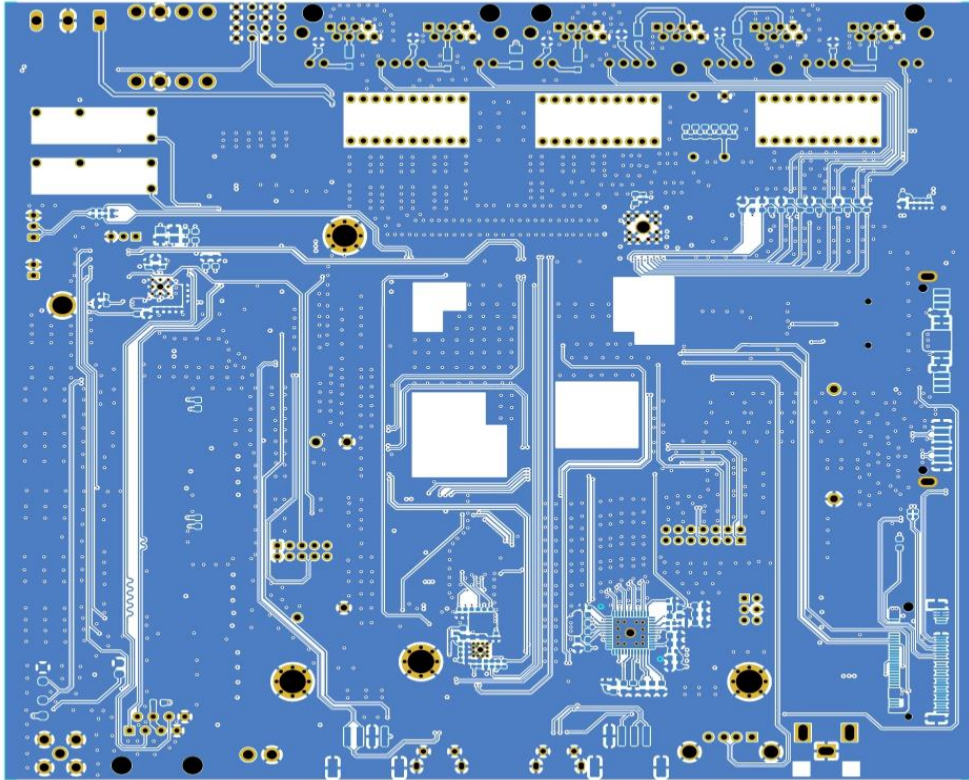


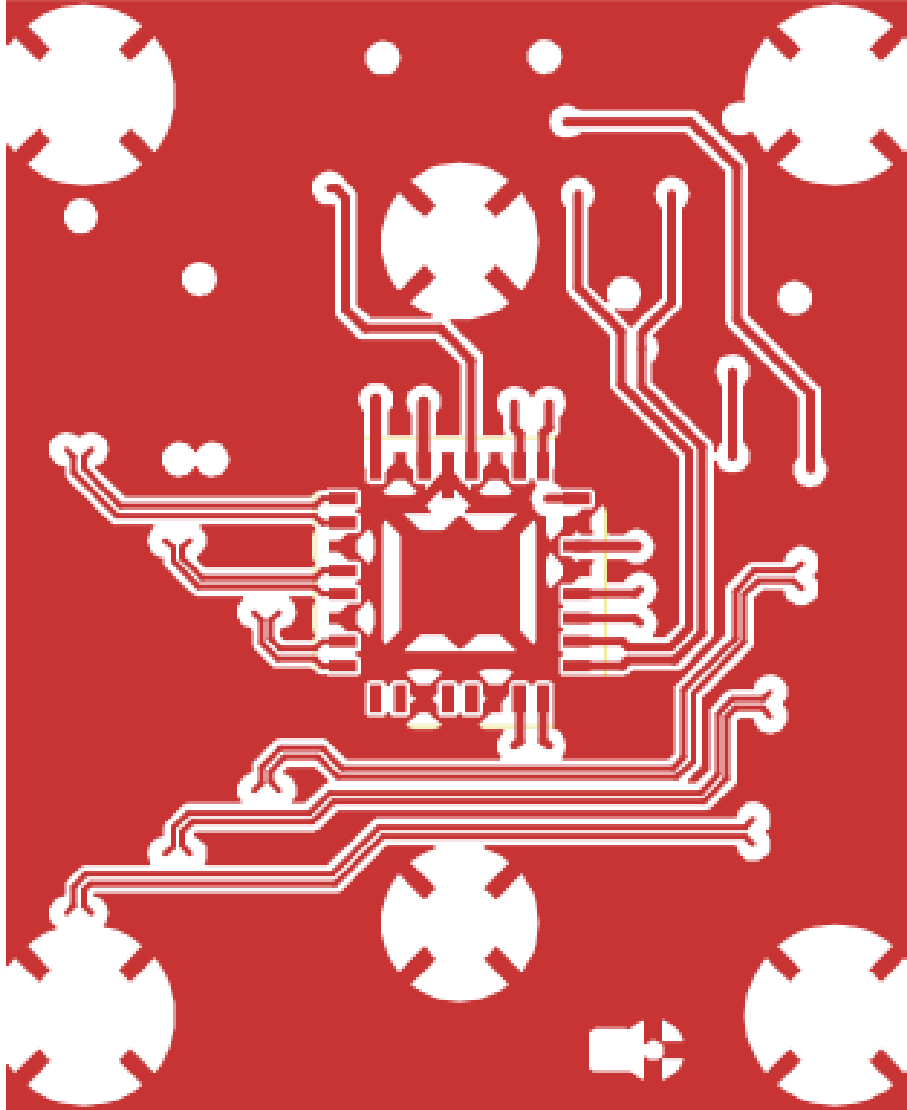


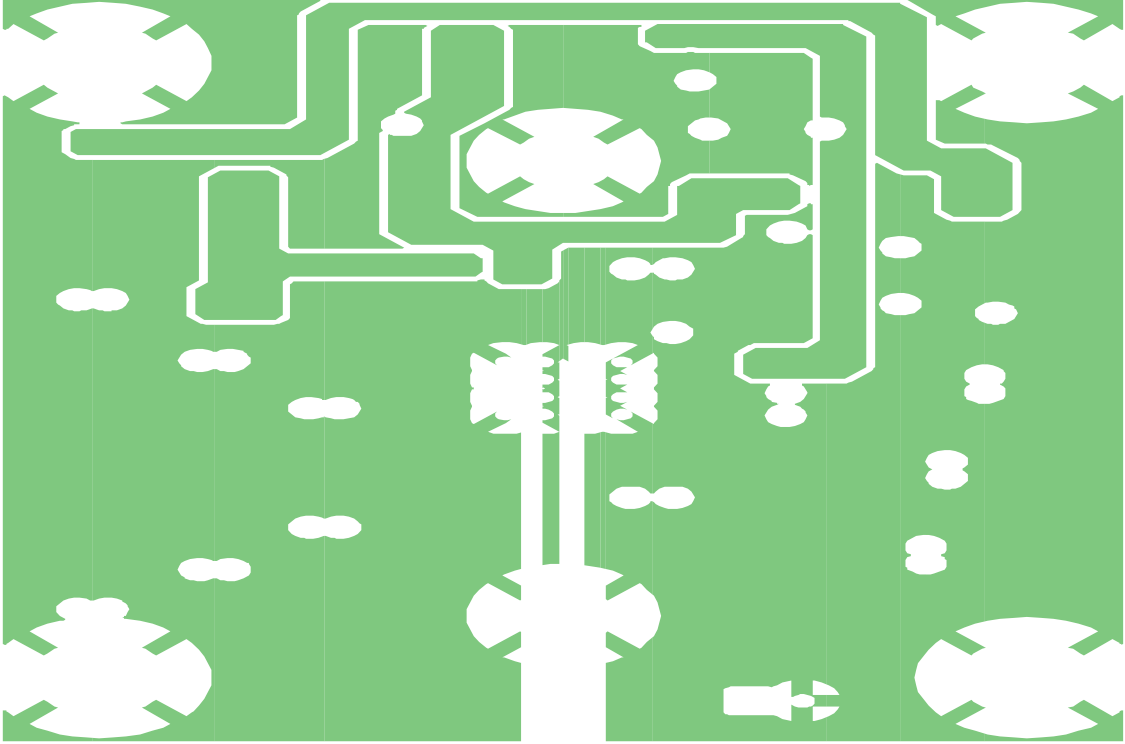


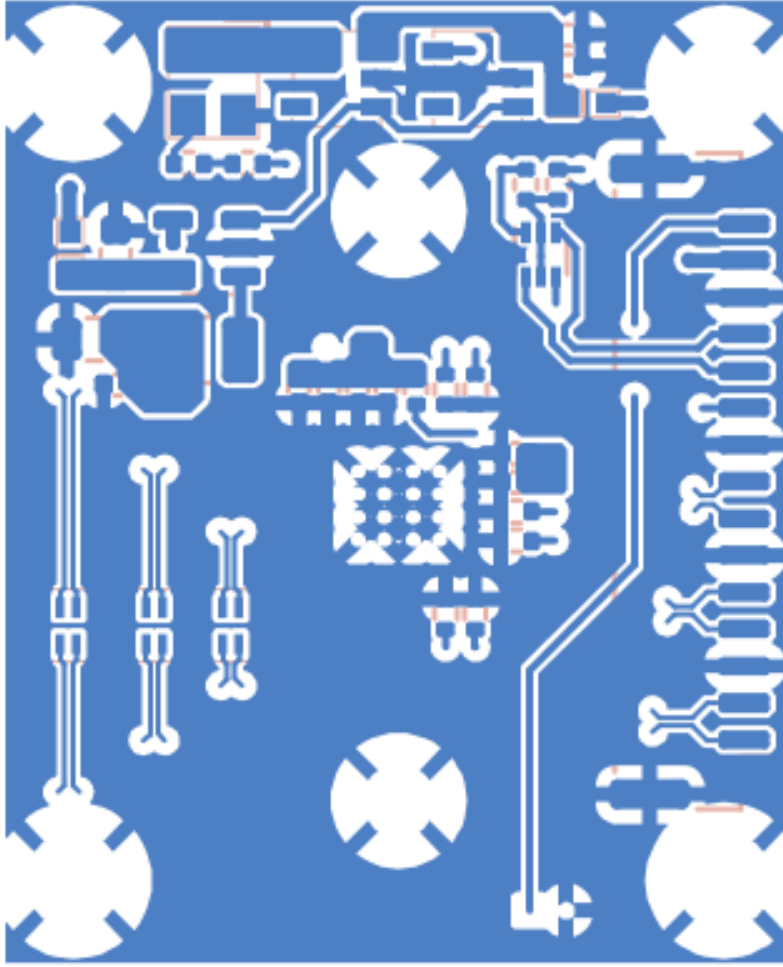


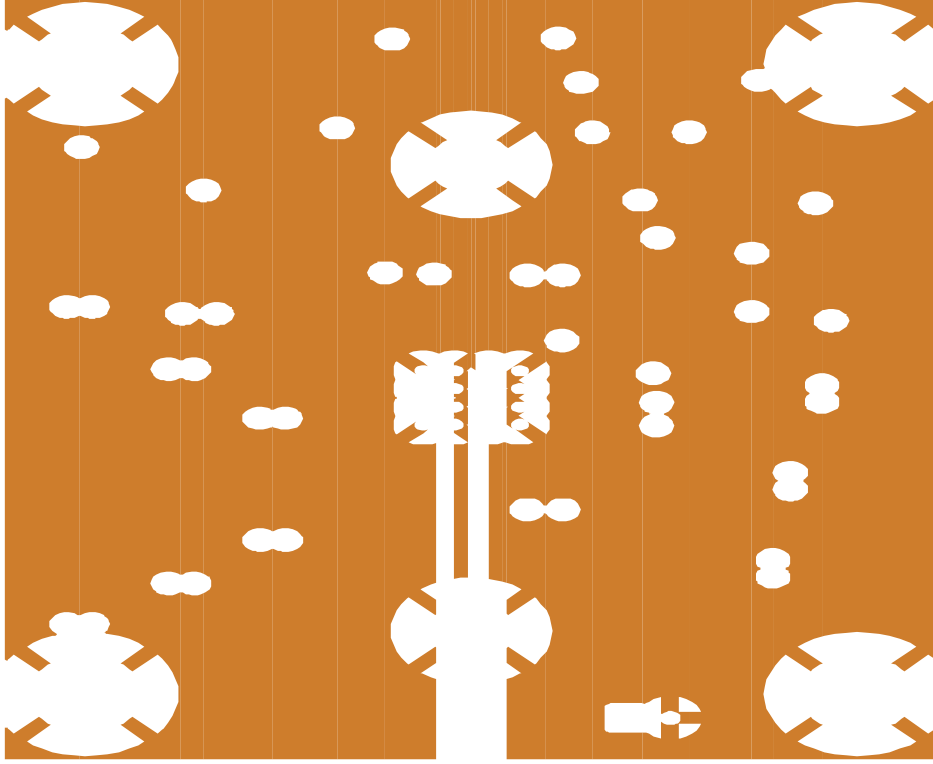












Value	Footprint
0R	Resistor_SMD:R_0402_1005Metric
0R	Resistor_SMD:R_0603_1608Metric
10pF	Capacitor_SMD:C_0603_1608Metric
15pF	Capacitor_SMD:C_0402_1005Metric
22pF	Capacitor_SMD:C_0603_1608Metric
27pF	Capacitor_SMD:C_0603_1608Metric
33pF	Capacitor_SMD:C_0603_1608Metric
100pF	Capacitor_SMD:C_0603_1608Metric
220pF	Capacitor_SMD:C_0603_1608Metric
10nF	Capacitor_SMD:C_0603_1608Metric
10nF	Capacitor_SMD:C_0402_1005Metric
100nF	Capacitor_SMD:C_0603_1608Metric
100nF	Capacitor_SMD:C_0402_1005Metric
330nF	Capacitor_SMD:C_0603_1608Metric
1uF	Capacitor_SMD:C_0603_1608Metric
4.7uF	Capacitor_SMD:C_0603_1608Metric
10uF	Capacitor_SMD:C_0603_1608Metric
22uF	Capacitor_SMD:C_0603_1608Metric
220uF	Capacitor_SMD:CP_Elec_6.3x7.7
10mR	Resistor_SMD:R_1206_3216Metric
1R	Resistor_SMD:R_0603_1608Metric
2.2R	Resistor_SMD:R_0402_1005Metric
10R	Resistor_SMD:R_0402_1005Metric
22R	Resistor_SMD:R_0603_1608Metric
22R	Resistor_SMD:R_0402_1005Metric
27R	Resistor_SMD:R_0603_1608Metric
33R	Resistor_SMD:R_0603_1608Metric
75R	Resistor_SMD:R_0402_1005Metric
75R	Resistor_SMD:R_0603_1608Metric
100R	Resistor_SMD:R_0603_1608Metric
150R	Resistor_SMD:R_0603_1608Metric
200R	Resistor_SMD:R_0603_1608Metric
220R	Resistor_SMD:R_0603_1608Metric
330R	Resistor_SMD:R_0603_1608Metric
470R	Resistor_SMD:R_0603_1608Metric
1K	Resistor_SMD:R_0603_1608Metric
1K	Resistor_SMD:R_0402_1005Metric



1.5K	Resistor_SMD:R_0402_1005Metric
1.6K	Resistor_SMD:R_0603_1608Metric
2.2K	Resistor_SMD:R_0603_1608Metric
2.49K	Resistor_SMD:R_0603_1608Metric
2.49K	Resistor_SMD:R_0402_1005Metric
3.3K	Resistor_SMD:R_0603_1608Metric
4.7K	Resistor_SMD:R_0603_1608Metric
4.7K	Resistor_SMD:R_0402_1005Metric
10K	Resistor_SMD:R_0402_1005Metric
10K	Resistor_SMD:R_0603_1608Metric
15K	Resistor_SMD:R_0603_1608Metric
40.2K	Resistor_SMD:R_0603_1608Metric
51K	Resistor_SMD:R_0603_1608Metric
100K	Resistor_SMD:R_0603_1608Metric
124K	Resistor_SMD:R_0603_1608Metric
232K	Resistor_SMD:R_0603_1608Metric
1000PF 2KV	Capacitor_THT:S102K33Y5PP63K5R
100nF X7R 16V	Capacitor_SMD:C_0402_1005Metric
16V 10uF X5R ±20%	Capacitor_SMD:C_0603_1608Metric
1uF/50V	Capacitor_SMD:C_0603_1608Metric
220uF/50V	Capacitor_SMD:C_Elec_10x10.2
2SS100L-W	2SS100L-W:2SS100LW
330uF/25V	Capacitor_SMD:C_Elec_8x10.2
36-3034-ND	Footprint Library:BatteryHolder_Keystone_3034_1x20mm
4.7uF/50V	Capacitor_SMD:C_0603_1608Metric
APCW3216-900P2T	DLW31SN900SQ2L:DLW31SH222SQ2L
AWL3225FP2R2MTF	Footprint Library:AWL3225FP2R2MTF
BL9342	Package_TO_SOT_SMD:SOT-23-6
BLM18PG121SN1D	BLM18PG121SN1D:BLM18AG102BH1D
BZT52C3V6	Diode_SMD:D_SOD-123
CBW160808U101T	Inductor_SMD:L_0603_1608Metric
CF4012M00020001	Crystal:Crystal_SMD_3225-4Pin_3.2x2.5mm
CM3566	Footprint Library:SMX66
DC3-6P MALE Connector	Footprint Library:Analog power connector
DC3-10P MALE Connector	Footprint Library:GSM connector
DC3-14P MALE Connector	Footprint Library:Analog signal connector
DNP	Capacitor_SMD:C_0603_1608Metric
DNP	Footprint Library:ERZV14D220



DNP	Footprint Library:SuperCapacitor
DNP	Capacitor_SMD:C_0402_1005Metric
DNP	Fiducial:Fiducial_0.5mm_Mask1mm
DNP	Footprint Library:AV_CON
DNP	Footprint Library:Screw Terminal Shinbo
DNP	Library:APCI0079-P002A J8900 M.2 M Key
DNP	Footprint:Screw Terminal Shinbo
DNP	Connector_PinSocket_2.00mm:PinSocket_1x03_P2.00mm_Vertical
DNP	Resistor_SMD:R_0603_1608Metric
DNP	Resistor_SMD:R_0402_1005Metric
DNP	TestPoint:TestPoint_Pad_1.0x1.0mm
DNP	TestPoint:TestPoint_Pad_D1.0mm
DNP	TestPoint_Pad_1.0x1.0mm
DTC043ZEBTL	Package_TO_SOT_SMD:SOT-416
ESD5341N	Footprint Library:ESD5341N
ESD5341N	Footprint Library:ESD5341N
ESD5451N	ESD5451N:ESD5451N
G-Switch GT-USB-7010ASV	Footprint Library:G-Switch GT-USB-7010ASV
HA42-4R7MT	Pro V3:Inductor_0402_4.7uH
HF46F_5-HS1	Footprint Library:HF46F5HS1
HX CYA1050-47UH	CYA1050-47UH:L_Bourns_SRR1208_12.7x12.7mm
JST_PH_B2B-PH-K_1x02_P2.00mm_Vertical	Connector_JST:JST_PH_B2B-PH-K_1x02_P2.00mm_Vertical
JST_PH_B3B-PH-K_1x03_P2.00mm_Vertical	Connector_JST:JST_PH_B3B-PH-K_1x03_P2.00mm_Vertical
JST_PH_S4B-PH-K_1x04_P2.00mm_Horizontal	Connector_JST:JST_PH_S4B-PH-K_1x04_P2.00mm_Horizontal
KF2EDGH-3.81-2P- Right Angle	Footprint Library:KF2EDGH-3.81-2P
KF2EDGH-3.81_8P-Right Angle	KF2EDGH:KF2EDGH-3.81_8P
KF2EDGR-Y-5.08-3P-Right Angle	KF2EDGH:KF2EDGR-Y-5.08-3P-Right Angle
LED_4_Block_Right Angle	LED_4:LED_4_Block
LED_RED	LED_SMD:LED_0603_1608Metric
LED_WHITE	LED_SMD:LED_0603_1608Metric
LED_YELLOW	LED_SMD:LED_0603_1608Metric
LL4148	Pro V3:LL4148
LQM21PN2R2MC0D	Inductor_SMD:L_0805_2012Metric
M3x*0.5 L=3	Footprint Library:Screw Terminal Shinbo
M3x*0.5 L=6	Footprint Library:Screw Terminal Shinbo
MICRO XNJ ZB	Footprint Library:Micro-B SMD
MLI1608F-1R2KT	Inductor_SMD:L_0603_1608Metric



MMBT2222ALT1G	HDMI 2.0 TX:MMBT2222ALT1G
MRA4007T3G	Library:MRA4007T3G
MS1836S_QFN48-7x7	Package_DFN_QFN:QFN-48-1EP_7x7mm_P0.5mm_EP5.6x5.6mm
PC817C	HDMI 2.0 TX:PC817
RJ45	Connector_RJ:RJ45_Amphenol_54602-x08_Horizontal
RJ45-2-Block	Connector_RJ:2_Block_RJ45
RJ45-4-Block	Library:4_Block_RJ45
RP2040	RP2040_minimal:RP2040-QFN-56
RT9013-12GB	Package_TO_SOT_SMD:SOT-23-5
RTL8188EU	Footprint Library:RTL8188EU
RTL8211F-CG	Footprint Library:RTL8211F-CG
RTL8309N-VB-CG	RTL8309N:RTL8309N
S6MC	Diode_SMD:S6MC
SAF-8ASC-2132M	SATA_Connector:SATA_Connector_5622-1200-ML
SDCL1608C2N7STDF	Inductor_SMD:L_0603_1608Metric
SHOU HAN MSS12C02LS-HB2.0	Footprint Library:SHOU HAN MSS12C02LS-HB2.0
SKRPANE010	Footprint Library:SKRPANE010
SMA Connetor_inner_pin	Footprint Library:SMA_Connector_inner_pin_right_angle
SS14	Footprint Library:SS14
SS54B	Library:SS54B
SY8113B	footprint:SY8113B
TAXM27M4RFBCT2T	Crystal:Crystal_SMD_3225-4Pin_3.2x2.5mm
TF-218DG	Transformer_THT:RJ45_Transformer_2_Port
TF-CARD H1.8	HDMI 2.0 TX:TF-CARD H1.8
TLV76033DBZT	Package_TO_SOT_SMD:SOT-23
UPZ1608E101-3R0TF	Inductor_SMD:L_0603_1608Metric
W25Q16JVS1Q	Package_SO:SOIC-8_5.23x5.23mm_P1.27mm
X322525MSB4SI	Crystal:Crystal_SMD_3225-4Pin_3.2x2.5mm
XL4015	Package_TO_SOT_SMD:TO-263-5_TabPin3
YI321611U101-4R0T	HI1206N101R-10:BEADC3216X130N



Value	Footprint
0R	Resistor_SMD:R_0402_1005Metric
0R	Resistor_SMD:R_0402_1005Metric
220nF	Capacitor_SMD:C_0402_1005Metric
1uF	Capacitor_SMD:C_0402_1005Metric
2.2uF	Capacitor_SMD:C_0402_1005Metric
4.7uF	Capacitor_SMD:C_0603_1608Metric
10uF	Capacitor_SMD:C_0805_2012Metric
22R	Resistor_SMD:R_0402_1005Metric
2.2K	Resistor_SMD:R_0402_1005Metric
1.8A 2.2uH	Inductor_SMD:L_1008_2520Metric
600Ω@100MHz 380mΩ	Footprint Library:BLM18SP221SN1B
90Ω@100MHz 1.88Ω	Footprint Library:DLP11SN900HL2L
AP7331-18WG-7	Footprint Library:AP7331
AP7331-28WG-7	Footprint Library:AP7331
DMG1024UV - 7	Package_TO_SOT_SMD:SOT-563
DNP	Resistor_SMD:R_0402_1005Metric
DNP	Footprint Library:Screw Terminal Shinbo_2
JST_1x15- 1MP_P1.25mm_Vertical	IMX219:JST_1x15-1MP_P1.25mm_Vertical
JST_1x2-1MP_P1.25mm_Vertical	Footprint Library:Con_2Ways_1.25mm
PAM2301CAAB120	Package_TO_SOT_SMD:SOT-23-5
SBP08047	IMX219:SBP08047
OT2EL4C4JI-111OLP-24M	Footprint Library:OT2EL4C4JI-111OLP-24M