Leiditech

Do you need?

Professional electromagnetic compatibility solution service and component supplier

Strong Protecting IC Peace For Mankind

Shanghai Leiditech Electronic Technology Co., Ltd.

Company Profile

Shanghai Leiditech Electronic Technology Co., Ltd., Our brand is Leiditech, founded in 2011, is a National High-tech Enterprise. The R&D team of the company is established by American Ph.D. and the former development manager of Ti, with a skilled R&D team and experienced experts in EMC industry, we mainly provide TVS/ESD and related EMC components (TSS/GDT, Zener, MOV, Rectifier Diode, PPTC, Mosfet, Inductor).

Leiditech serve customers around EMC, has set up a free laboratory to test electrostatic ESD (30kV), Electrical fast transient EFT(4kV), Surge (8/20, 10/700, 10/1000), Load-dump (7637-2 5A/5B) and electronic component parameter compare for customers. Leiditech keeps abreast of technological updates at domestic and overseas, and constantly innovates EMC protection solutions and related components. The target direction is smaller package, higher power, and provides reliable solutions and components made in china.

Leiditech major service markets are: Telecom&Security, Automotive, Electronics, Medical Electronics, Lighting, Industrial Products , Consumer Electronics Market and so on.

Leiditech won the IATF16949、ISO09001-2015 certificate, Leiditech products meet the relevant national testing standards and requirements, as well as IEC, FCC, UL, VDE and other international standards, and have obtained ROHS, REACH and other series of certification. Leiditech products can meet the requirements of high specification lightning protection, over-voltage and over-current protection, so as to improve the service life of the product.

Leiditech has many patent products, compares foreign types with big data compareing to meet the domestic substitution, establishes a proprietary technology platform (WeChat small program: EMC electromagnetic compatibility community), and establishes an official website matching imported models.

Leiditech believes that a wide range of products and a vertically integrated business model keeps competitive advantage. Help customers saving time, effort and money in design and production and success one-time by helping them to design forward according to applicable standards during the initial design phase of the project.

Leiditech products have been widely used around the world and support LOCAL brands around the world. Leiditech is already well known in the TVS/ESD industry. Our customers include Future, Honeywell, LG , Volkswagen, BYD, Midea, Skyworth, hello Bike, Xiaomi, Foxconn and so on.

Leiditech purpose is:Integrity－based, think for customer and do what our customer want urgently , we stick to be a professional supplier of EMC solution services and components.

Leiditech Culture:

Efficient work and wisdom life;

The whole company is a team,everyone is a responsible unit;

Itegrity-based,for the customer’s thinking,the urgency of the customer;

Strive to become a professional supplier of EMC components.

Honor of Qualification

Trademark

专精特新

IATF16949

ISO9001

Publish Books

- National Standards Drafter
- Approved ISO9001-2015
- High-Tech Enterprise
- Approved IATF-16949
- Electrostatics Association Director
- Multiple Integrated Circuit Design Patent
- Power Association Director
- Published Three Issues of Books of EMC
- Automotive Electronics Aliancer
- National Electrostatics Standard Committee

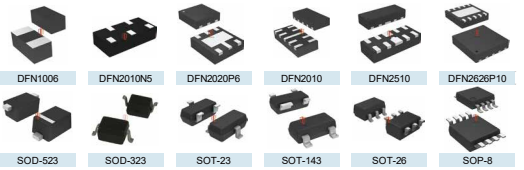
ESD Selection Tips

1.The Vrwm is bigger or equal to the circuit working voltage is better.

2.The Cp of ESD is confirmed by the rate of data port, the data transfer more faster ,the Cp of ESD should be more smaller.

3.Selecting suitable Ipp for your circuit, the suitable Vc for your circuit and power=Ipp*Vc*power factor.

4.According to the PCB to select package (1-channel or multi-channels).



Information of ESD

Electrostatic Discharged Protection Devices, referred to as ESD. It is mainly used to protect the Electrostatic Discharge of communication interface .

The reason of Electrostatic Discharge：

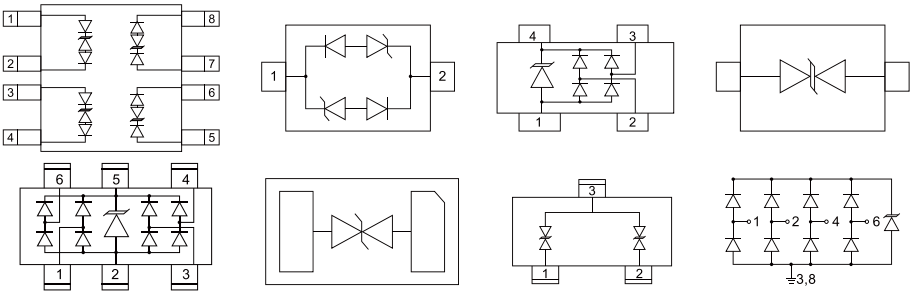
a.Two substances via the contact friction and loss of electrons or the electron, the charge band (no flow) termed static;

b.Due to switch electricity or lightning induced surge also indirect causes static electricity;

c.Temperature and humidity affect the turboelectric charged, at less than 45℃, it will produce higher humidity greater voltage more than in 55℃, damaging also relatively large.

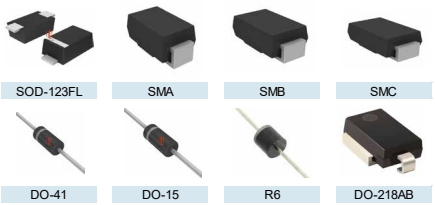
Most commonly used types

No.	Part Number	Power (W)	Vrwm(V)	Vb(V)	Vc (V)@1A	C(PF)	Features	Package
1	ESDA05CP	40	5	6	9.8	5	1CH,BI	DFN1006
2	SD05C	320	5	6	9.8	200	1CH,BI	SOD-323
3	SMC24	350	24	26.7	43	40	2CH,BI	SOT-23
4	SRV05-4	350	5	6	12.5	1	5CH,UNI	SOT-26
5	LC05CI	350	5	6	9.8	0.4	1CH,BI	SOD-323
6	ULC0544P10	50	5	6	9.8	0.35	4CH,UNI	DFN2510P10
7	SLVU2.8-4	400	2.8	3	8.5	2	4CH,BI	SOP-8
8	ESD5Z5CL	100	5	6	9.8	0.5	1CH,BI	SOD-523
9	SR05	500	5	6	9.8	3	3CH,UNI	SOT-143
10	SDA05CW	100	5	6	9.8	50	5CH,UNI	SOT-363
11	SM712	400	7/12	7.5/13.3	10/20	55	2CH , BI	SOT-23



TVS Selection Tips

1.The Vrwm of TVS should be more than 10% working voltage and tolerance, that protect the Max DC or continuous working voltage of circuits. If the Vrwm is too low, the device will affect the normal work of the circuits because of the snow slide or reverse electric leakage. The current will be divided in the parallel circuit and the voltage will be divided in the serial circuit.



2.The VC of TVS should be less than the damaged voltage of protecting circuits.

3.The Ppp of TVS should be more than the possible peak pulse of protecting circuits.

4.The Ipp of TVS should be more than the surge current of transient circuit.

5.For the lightning protection of data interface circuit, the semiconductor ESD of low capacitance is better.

6.The selection of TVS' polarity and encapsulation structure should based the application. For the AC circuit, the dual polarity TVS is better, and for the Multi-line protection, the ESD array of semiconductor is better.

Information of TVS

The transient Voltage Suppressor, referred to as TVS, the TVS operates by shunting excess current when the induced voltage exceeds the avalanche breakdown potential. It is a clamping device, suppressing all over voltages above its breakdown voltage. It automatically resets when the overvoltage goes away, but absorbs much more of the transient energy internally than a similarly rated crowbar device.

Part Number	Power (W)	Vrwm(V)	IR(uA)	Vbr (V)	It (mA)	Vc@Ipp(V)	Ipp (A)	Package
P4KE Series	400	5.8~495	1000-1	6.45~577.5	10/1	10.5-760	39.0-0.5	DO-41/DO-204AL
P6KE Series	600	5.8~512	150-1	6.45~630.0	10/1	10.5-828	57.2-0.8	DO-15/DO-204AC
1.5KE Series	1500	5.8~512	150-1	6.45~630.0	10/1	10.5-848	147.1-1.8	DO-201
3KP Series	3000	5.0~220	150-1	6.40~272.0	10/1	9.2-371.1	326.1-8.4	R6/P600
5KP Series	5000	5.0~250	150-1	6.40~306.0	10/1	9.2-425	544-12	R6/P600
8KP Series	8000	10~250	1000-5	11.1~306.0	5	18.4-425	442.2-19.1	R6/P600
15KP Series	15000	17~280	5000-2	18.9~341.0	5	29.3-454.5	515.4-33.2	R6/P600
20KP Series	20000	20~300	5000-2	22.2~360.0	5	36.8-483.0	543.5-41.4	R6/P600
30KP Series	30000	28~400	5000-2	31.28-494	50/5	50-648	600.0-46.3	R6/P600
SMAJ Series	400	5.0-440	100-1	6.4~543.0	10/1	9.2-713.0	43.5-0.6	SMA/DO-214AC
SMBJ Series	600	3.3~440	200-1	4.6~543.0	10/1	7.3-713.0	50-0.8	SMB/DO-214AA
P6SMB Series	600	5.8~512	1000-5	6.45-570	10/1	10.5-828	58.1-0.75	SMB/DO-214AA
SMCJ Series	1500	5.0~440	300-1	6.4~543	10/1	9.2-713	163.0-2.1	SMC/DO-214AB
5.0SMDJ Series	5000	5.0~440	5000-2	6.4~543	50/1	9.2-713	554.3-6.16	SMC/DO-214AB
SM5S Series	5000	10~36	5	11.1~44.2	5	17-58.1	212-62.0	DO-218AB
SM8S Series	6600	10~43	5	11.1~52.8	5	17-69.4	388-95.1	DO-218AB

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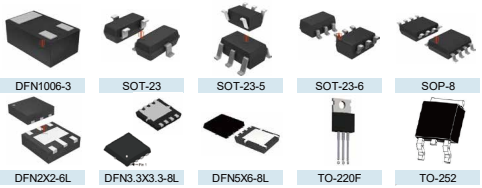
MOSFET Selection Tips

1.Choose N channel or P channel, in the low-voltage side switch, N channel MOSFET should be used, which is due to the consideratio of the voltage required for the off or on-device. When the MOSFET is connected to the bus and the load is grounded, the high-voltage side switch is used. This is usually due to the consideration of voltage drive.



2.The higher the rated voltage, the higher the cost of the device, the VDS must cover the rated operating voltage range of the circuit and pay attention to the temperature curve.

3.Determine the rated current, which should be the maximum current that the load can withstand under all circumstances.

4.After selecting the rated current, the on-off loss must also be calculated. The MOSFET acts like a variable resistor when it is "ON", determined by the RDS(ON) of the device, and varies significantly with temperature. Device power loss can be calculated by Iload2 × RDS(ON) and varies proportionally accordingly. The higher the voltage VGS applied to the MOSFET, the smaller the RDS(ON) will be; RDS(ON), on the other hand, is a tradeoff. For portable designs, higher voltages can be used with a higher design. Note that the RDS (ON) resistance rises slightly with the current.

5. Determine the switching performance, which is the grid/drain, grid/source and drain source capacitance. These capacitors create switching losses in the device because they are lower each time they are switched and the device efficiency decreases. To calculate the total loss of the device during switching, the designer must calculate the loss during switching on (Eon) and the loss during switching off (Eoff).

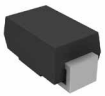
Information of MOSFET

Metal-oxide semiconductor field-effect transistor (MOSFET). It is a kind of field-effect transistor that can be widely used in analog and digital circuits. MOSFET according to its "channel" (working carrier) polarity is different, can be divided into "N type" and "P type" of two types, usually known as N-MOSFET and P-MOSFETMOSFET widely used in circuit electronic switches.

Part Number	Package	N/P	Vdss Min(V) Drain-Source voltage	Drain Current ID(A)25°C	Vgs(V) Gate-source voltage (±)	VTH Typ	Ron(10V) (mΩ)Typ	Ron(10V) (mΩ)Max	Ron(4.5V) (mΩ)Typ	Ron(4.5V) (mΩ)Max
LM1D06N03	DFN1006-3	N	30	0.6	12	0.8~1.5	-	-	320	500
LM1202	DFN1.2*1.2-3	N	20	0.8	10		-	-	190	250
LM3D20N03	DFN3.3X3.3-8	N	30	20	20	1.5	7.6	9	11.5	15
LM5D40N10	DFN5X6-8	N	100	40	20	1.8	15	19	18	23
LMTL3N06	SOT-23	N	60	3	20	1.2~2.5	80	100	85	110
LM3L5N06	SOT-23-3	N	60	5.8	20	1.76	28	38	35	50
LM6L3N10A	SOT-23-6	N	100	3	20	1.8	95	120	100	140
2SK3018W	SOT-323	N	30	0.1	20	0.8~1.5	-	-	-	8000
2N7002NT	SOT-523	N	30	0.15	20	0.6~1.5	2600	4000	6000	8000
LMFB7N65	TO-220F	P	650	7	30	2~4	1000	12000	-	-
LMMP83N60	TO-247	P	600	83	30	-	28	36	-	-
LMPI5N60	TO-251	N	600	5	30	2.8~4.2	750	840	-	-
LMAK2N60	TO-252	P	600	2	30	2~4	3500	4500	-	-
LMFZ120N08	TO-263	P	80	120	20	3	4.9	6	-	-
LMSP09N90	TO-3P	N	900	9		-	0.97	1.15	-	-
LM1D06P03	DFN1006-3	P	-25	-0.6	12		-	-	430	560
LM2D9P01K	DFN2020-6	P	-12	-8.2	8	-1	-	-	14.6	18
LM5D90P03	DFN5X6-8	N	-30	-90	20	-1.6	4.9	6.4	7.5	10.5
LM2305B	SOT-23	P	-20	-5.4	10	-4.0~-1.0	-	-	32	40
LM6L4P06	SOT-23-6	P	-60	-4	20	-2.5~-1.0	82	100	100	130
LMSS84W	SOT-323	P	-50	-0.13	20	0.8~2	-	-	5000	10000
LMTM5P10	SOT-223	N	-100	-5	20	-1.0~-2.5	83	110	95	120
LM8S10P03	SOP-8	P	-30	10	20	-2.8~-1.0	16	23	21	34
LMAK13P06	TO-252	N	-60	-13.5	20	-1.75	80	90	100	115
LMAK8P20	TO-252	N	-200	-8	30	-4~-2	400	750	-	-
LMCSP9ND01	CSP2.14X1.4	N+N	12	9	8	0.6	-	-	4.5	-
LM2D6PD02	DFN2020-6	P+P	-20	-6	8	-0.4~-1	-	-	36	50
LM3D7ND03	DFN3.3X3.3-8	N+N	30	7	20	1.6	15.5	18.5	26.5	30
LM5D20PN03	DFN5X6-8	N+P	30/-30	28@N -19.7@P	20	1.6/-1.6	8.5/20	12/25	11/28	16/38
LM4616	SOP-8	N+P	30/-30	8/-7	20	1.2~2.4	17	19	21	25

TSS Selection Tips

1.Vdm of TSS should be higher than the Max of the protected circuit DC or standard rated voltage working voltage, circuit and "high-end" allowances. If the Vdm is too low, the devices may enter an avalanche or much reverse current circuit to work properly. The serial should be connected the component voltage ,and the parallel to partial current.


SMA


SMB


SOP-8


DO-15

2.VBO of the TSS must be less than the permitted circuit maximum instantaneous peak voltage.

3.The Ipp of TSS should be higher than the transient surge circuit.

4.Selecting the package according the PCB or preference.

Information of TSS

Thyristor Surge Suppressors, referred as TSS, TSS is based on the principle of SCR using ion implantation and production of a new type of protective device, with precise turn-on, rapid response (response time NS grade), surge absorption ability, bi-directional, high reliability characteristics. Due to its surge capacity is stronger more than same size TVS , and can be used instead TVS tube in passive circuits. They are small in size compared to their high surge current ratings. Operating voltages range from 20 Volts to 250 Volts with current ratings of 50 Amps to 200 Amps for a 10/1000us waveform. Package configurations include axial lead, surface mount or cellular discs.

No.	Part Number	Vdrm(V)	Vbo(V)	Vt(V)	Idrm(UA)	Is(MA)	It(A)	Ih(MA)	Cp(PF)	Package
1	P0080S*--P3500S*	6-320	25-400	4	5	800	2.2	50-150	30-70	SMA/SMB
2	P0080E*-P3500E*	6-320	25-400	4	5	800	2.2	50-150	30-70	TO-92
3	P0080L*-P3500L*	6-320	25-400	4	5	800	2.2	50-150	30-70	DO-15
4	P0080S*2--P3500S*2	6-320	25-400	4	5	800	2.2	50-150	30-70	SMB-3

Surge Ratings

Series	Ipp*(A)				
	2/10 μs	8/20 μs	10/160μs	10/560μs	10/1000μs
SA	200	150	100	60	50
SB	250	250	150	100	80
SC	500	400	200	120	100

SIDAC

No.	Types	Vbo(V)	Vbo(V)	Vdrm(V)	Idrm(UA)	Vtm(V)	It(A)	Ih(MA)	Package
		*Min	*Max	*Min	*Max	*Max	*Max	*Max	
1	K0900L-K5000L	80-505	100-600	65-420	5	1.5	1	100	DO-15
2	K0900D-K5000D	80-505	100-600	65-420	5	1.5	1	100	SMB
3	K0900E-K5000E	80-505	100-600	65-420	5	1.5	1	100	TO-92

Zener Selection Tips

1.Vz Zener-voltage value needs to be the same as the reference voltage value of the applied circuit.

2. Izt Zener-current is greater than the rated current for better voltage regulation.The Zener-current should be higher than 50% of the maximum load current of the applied circuit.

3.Zzt: the smaller the dynamic resistance, the better the voltage regulation effect.

4.IR: Reverse leakage current, the smaller the better.

5. Pd: Zener's Pd in the working circuit should not exceed the maximum power dissipation.

6. Selecting the suitable package according to the circuit needs.

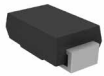

SOD-882


SOD-523


SOD-323


SOD-123FL


SMA


SMB

Information of Zener

Zener diode is a surface contact crystal diode made of silicon material. This diode is a semiconductor device with high resistance until the critical reverse breakdown voltage age is reached. In a certain range of current (or in a certain range of power loss), the voltage regulator is almost invariable in a certain range of current (or in a certain range of power loss), which shows a steady voltage characteristic, so it is widely used in the voltage regulator and limiting circuit. The voltage stabilizing diode is divided according to the breakdown voltage. Because of this characteristic, the regulator is mainly used as a voltage regulator or a voltage reference element. A voltage stabilizing diode can be connected in series for higher voltage, and more stable voltage can be obtained by connecting series, which is called a bidirectional voltage regulator.
The power of the device vanes from 0.5W-5W.
Voltage from 2.4V to 200V.

Part Number	Zener Voltage				PD(mW)	Package
	VZ (V)			'@ IZT		
	Min	Nom	Max	mA		
LNZ8F5V6T5G	5.32	5.6	5.88	5	200	SOD-882
LNZ9F10VT5G	9.5	-	10.5	5	200	SOD-923
LM5Z3V6T1G	3.4	3.6	3.8	5	200	SOD-523
LM5Z4V7T1G	4.4	4.7	5	5	200	SOD-523
LEDZ5.6BT1G	5.49	-	5.73	5	150	SOD-523
BZT52C2V4S	2.2	2.4	2.6	5	200	SOD-323
BZT52C5V1S	4.8	5.1	5.4	5	200	SOD-323
BZT52C18S	16.8	18	19.1	5	200	SOD-323
BZX84B2V7	2.65	2.7	2.75	5	300	SOT-23
BZX84C3V3	3.1	3.3	3.5	5	300	SOT-23
LMSZ5226BT1G	3.14	3.3	3.47	20	500	SOD-123
BZT52C12	11.4	12	12.6	150	500	SOD-123
SMF4742A	11.4	12	12.6	21	1000	SOD-123FL
S-SMF4742A	11.4	12	12.6	21	1000	SOD-123FL
SMA5918A	4.85	5.1	5.36	73.5	1500	SMA
SMA4745A	15.2	16	16.8	15.5	1000	SMA
SMA4750A	25.65	27	28.35	9.5	1000	SMA
S-SMA4733A	4.85	5.1	5.36	49	1000	SMA
S-SMA5921A	6.46	6.8	7.14	55.1	1500	SMA
SMB5336A	4.09	4.3	4.52	290	5000	SMB
SMB3Z5.6A	5.32	5.6	5.88	134	3000	SMB
S-1SMB5927B	11.4	12	12.6	63	3000	SMB
ZMM9V1	8.5	9.1	9.6	5	500	LL-34

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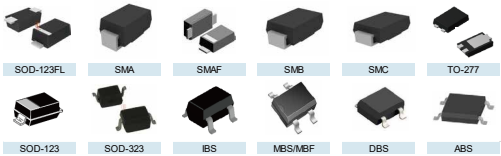
Rectifier Selection Tips

1. According to voltage suitable, select Ifsm and Vrrm.

2.It will be better if the Vf is smaller.

3. According circuit necessary to select Trr and package.



Information of Rectifier

A rectifier diode lets electrical current flow in only one direction and is mainly used for power supply operation. Rectifier diodes can handle higher current flow than regular diodes and are generally used in order to change alternating current into direct current. They are designed as discrete components or as integrated circuits and are usually fabricated from silicon and characterized by a fairly large P-N-junction surface. This results in high capacitance under reverse-bias conditions. In high-voltage supplies, two rectifier diodes or more may be connected in series in order to increase the peak-inverse-voltage (PIV) rating of the combination. the mainly types of rectifier are: Standard Rectifiers、Fast Rectifier、Ultrafast Rectifiers、Schottky Diodes、Bridge Rectifiers.

Part Number	V_{RRM}(V)	$I_{F(AV)}$ (A)	I_{FSM} (A)	V_F (V)	I_R (TA = 25)	Package
LM631BS-40	40	0.2	0.5	0.4	0.4μA	SOD-882
RB520S-30	30	0.2	1	0.5	1μA	SOD-523
SM5819WS	40	1	9	0.6	1mA	SOD-323
MBR0520	20	0.5	5.5	0.45	0.2mA	SOD-123
DSK14	40	1	25	0.55	0.5mA	SOD-123FL
DSK34	40	3	80	0.55	0.5mA	SOD-123FL
DSK34L	40	3	60	0.31	0.2mA	SOD-123FL
DSK26H	60	2	50	0.74	0.1uA	SOD-123FL
DSK320	200	3	70	0.95	0.3mA	SOD-123FL
LA4	400	1	25	1.1	10μA	SOD-123FL
LA7	1000	1	25	1.1	10μA	SOD-123FL
S-DSK210K	100	2	50	0.85	0.1mA	SOD-123FL
SS14	40	1	40	0.55	0.5mA	SMA
SS34LA	40	3	90	0.45	1mA	SMA
SS520	200	5	150	0.95	0.5mA	SMA
ES1J	600	1	30	1.35	5μA	SMA
S3J	600	3	100	0.98	5μA	SMA
M7	1000	1	30	1	10μA	SMA
GA2YA	2000	2	30	1.1	2uA	SMA
SK24	40	2	50	0.5	2mA	SMB
SK34B	40	3	100	0.5	0.5mA	SMB
SK510B	100	5	100	0.85	1mA	SMB
S-SK56C	60	5	150	0.7	0.5mA	SMC
SK510	100	5	150	0.85	1mA	SMC
S5M	1000	5	100	0.98	5μA	SMC
SS10U45	45	10	150	0.45	300uA	TO-277
SS10U60	60	10	150	0.5	300uA	TO-277
MBR20100CS	100	20	250	0.69	10uA	TO-252
GP45A160P	1600	45	500	1.08	0.05mA	TO-247
MBR3045CD	45	30	380X2	0.56	0.1mA	TO-263
MBR40100CT	100	40	250	0.84	0.05mA	TO-220
10A10	1000	10	400	1.0	10μA	R6
MB10S	1000	0.8	35	1	5μA	MBS
MB10F	1000	0.8	30	1.05	10μA	MBF
VMB10S	1000	0.8	30	1	5μA	IBS

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GDT Selection Tips

1.The DC spark-over voltage of GDT should be more than 30% standard voltage and “high-end” tolerance, that protect the Max DC, continuous working voltage and circuits.

2.The Ipp of GDT should be more than the surge current of transient circuit.

Information of GDT

The Gas Discharge Tube, referred as GDT, GDT’s have two parallel electrodes in a low pressure inert gas cavity made of glass or ceramic. These devices are “DC” voltage rated at a rise time of 500 Volts per second. The spacing and size of electrodes determines the voltage and current ratings respectively. The GDT's Ipp rated at 1kA to 250kA@8/20us. It has high insulation resistance, no leakage current, no aging failure, bidirectional protection, capacitance is extremely low, the breakdown voltage greater dispersion. These devices are largely used in the telecom sector for protecting subscriber stations and central office exchanges from primary lightning strikes.

Type Number	100V/s (V)	1kV/us (V)	8/20us (KA)	50Hz,1sec(A)	Test Voltage DC(V)	(GΩ)	Cj (pF)	package (MM)
SMD3216-075N	75±30%	<500	1	0.5	25	0.1	0.5	3.2*1.6*1.6
SMD3216-090N	90±30%	<500	1	0.5	50	0.1	0.5	3.2*1.6*1.6
SMD3216-600N	600±20%	<900	1	0.5	100	0.1	0.5	3.2*1.6*1.6
SMD3225-090NF	90±30%	<700	1	-	100	1	0.5	3.2*2.5*2.5
SMD4532-090NF	90±30%	<700	3	3	50	1	0.8	4.5*3.2*2.7
SMD4532-200NF	200±20%	<750	3	3	100	1	0.8	4.5*3.2*2.7
SMD4532-600NF	600±20%	<1200	3	3	250	1	0.8	4.5*3.2*2.7
SMD5050-090	90±20%	<600	5	5	52	1	1	5.0*5.0*4.2
SMD5050-800	800±20%	<1400	5	5	150	1	1	5.0*5.0*4.2
2R090-4S	90±20%	<600	3	3	50	1	1	4*4.2*4.2
2R1000-4S	1000±20%	<1600	3	3	100	1	1	4*4.2*4.2
2R090-5S	90±20%	<600	5	5	52	1	0.5	5.0*5.0*4.2
2R600-5S	600±20%	1200	5	5	-	-	1.5	5.0*5.0*4.2
2R090SB-8	90±20%	<600	10	10	50	1	1.5	8.3*8.3*6
2R230SD-8	230±20%	<700	20	20	100	1	1	8.3*8.3*6
3R090-4BS	90±20%	<650	6	1	50	1	1	6.8*3.5*3.5
3R090-5S	90±30%	<600	5	5	50	1	2	7.2*5*5
3R400SB-5	400±20%	<900	10	10	100	1	2	7.6*5*5
3R090SB-6	90±20%	<750	10	10	50	1	2	8.5*6.1*6.1
3R230SB-7	230±20%	<800	10	10	100	1	2	11.5*7.5*7.5
3R090SB-8	90±20%	<750	10	10	50	1	2	10*8.1*8.1
2R090TA-5	90±20%	<600	5	5	50	1	1	5.5*6 DIP
2R3600-8L	3600±20%	<4500	5	1	250	1	1	8.0*8.0*6 DIP
3R090LA-5	90±20%	<600	5	5	50	1	1	7.6*5.0*5.0 DIP
3R090LA-6	90±20%	<750	5	5	50	1	2	8.1*6.1*6.1 DIP
3R090LB-6	90±20%	<600	10	10	50	1	2	8.6*6 DIP
3R090TA-5	90±20%	<600	5	5	50	1	1	7.6*5.0*5.0 DIP
3R090TB-6	90±20%	<750	10	10	50	1	1	8.5*6.1*6.1 DIP
3R230TB-7	230±20%	<800	10	10	100	1	2	11.5*7.5*7.5 DIP
3R090TB-8	90±20%	<750	10	10	50	1	2	10.1*8.1*8.1 DIP

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MOV Selection Tips

1.Recognize the maximum allowable voltage: (product working voltage /supply voltage), power supply: AC or DC.

2.Pay attention to the stability of the supply voltage: ± 10%, ± 30% or ± 20%.

3.Maximum voltage (transient surge voltage of the device can accept).

4.Confirm Energy=K*Vc (v) *Ipp (a) *Time (s).

5.V1mA=1.5Vp=2.2Vac, the Vp is the peak of circuit rated voltage (1.414*Vac), Vac is a valid value of the rated AC voltage, selection the Vdr is essential, it is related to protection and longevity.

Information of MOV

Metal Oxide Varistor is referred MOV, usually closed to the edge of the PCBA design on the Layout side, especially will be at the main power source supply into or transmit port, the important is regulated the energy firstly when entering. MOV role is prevention of surge from lightning cable into the products lead to damage; Prevention unstable power voltage following the ON/OFF side access to the circuit, make the product function damage;
Prevention damage static electricity into the product.

Part Number	Working Voltage AC VAC	Working Voltage DC VDC	Breakdown Voltage @ 1mA DC VB		Clamping Voltage 8/20uS VC	Peak Current 8/20uS(A) Ipp(MAX) 0603	0805	1206	1210	1812	2220	3220
MVR0603-5R0G	2.4	3.3	5	4.0 ~ 6.0	12	20	60	80	-	-	-	-
MVR0603-330G	20	26	33	29 ~ 36	54	20	80	100	250	500	1200	500
MVR0603-471G	300	385	470	423~517	775	-	-	-	-	-	-	400
MVR0805-120G	7	9	12	10 ~ 14	24	20	60	80	250	400	800	-
MVR0805-680G	40	56	68	60 ~ 75	110	-	-	100	250	500	1200	500
MVR1206-270G	17	22	27	24 ~ 30	42	20	80	100	250	500	1200	500
MVR1206-101G	60	85	100	90 ~110	165	-	-	80	200	300	800	500
MVR1210-390G	24	30	39	35 ~ 42	65	20	80	100	250	500	1200	500
MVR1812-8R0G	4	5.5	8	7.0 ~10.5	14	20	60	80	250	400	-	-
MVR1812-820G	50	65	82	73 ~ 91	135	-	-	80	200	300	800	500
MVR2220-8R0G	4	5.5	8	7.0 ~10.5	14	20	60	80	250	400	-	-
MVR3220-3R0G	1.4	2	3	2.4 ~ 3.6	9	20	-	-	-	-	-	-

Part Number	Vac (V)	Vdc (V)	V1mA (V)	Ipp (A)	Vc (V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	Rated power (W)	C @1KHz (pf)
05D470K 05D470KJ	30	38	47	1	104	100	250	1.1	1.5	0.01	530
05D471K 05D471KJ	300	385	470	5	810	400	800	15	21	0.1	55
07D101K 07D101KJ	60	85	100	10	165	1200	1750	6.5	12	0.25	500
07D471K 07D471KJ	300	385	470	10	775	1200	1750	30	42	0.25	105
10D241K 10D241KJ	150	200	240	25	395	2500	3500	35	42	0.4	420
10D471K 10D471KJ	300	385	470	25	775	2500	3500	65	85	0.4	210
14D680K 14D680KJ	40	56	68	10	135	1000	2000	14	24	0.1	2900
14D471K 14D471KJ	300	385	470	50	775	4500	6000	125	175	0.6	430
20D471K 20D471KJ	300	385	470	100	775	6500	10000	220	350	1	850
20D681K 20D681KJ	420	560	680	100	1120	6500	10000	230	400	1	600
25D471K 25D471KJ	300	385	470	150	775	15000	-	400	-	-	1400
40D471K	300	385	470	300	775	40000	-	720	-	-	4300
53D511K	320	415	510	500	845	70000	-	1150	-	-	6000

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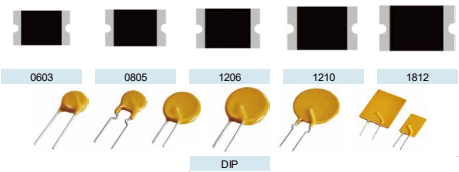
PPTC Selection Tips



1.Determine the following circuit operating parameters:
- Normal operating current – I_{HOLD}
- Maximum circuit voltage – V_{MAX}
- Maximum interrupt current – I_{MAX}
- Ambient operating temperature

2.Select the suitable package SMD or DIP.

3.Compare the PTC data sheet ratings for VMAX and IMAX to ensure that the circuit parameters do not exceed these ratings.

4.Verify that the ambient operating temperature within close proximity to the device is within its normal operating range. Thermally derate IHOLD and IMAX as necessary.

Information of PPTC

Polymer positive temperature coefficient is referred PPTC. For over-current protector, can palce circuit element. The PPTC element protects the circuit by changing from a low-resistance to a high resistance state in response to an over current.

Part Number	Ih(A)	It(A)	Vmax (Vdc)	Imax (A)	Trip current (A)	Trip time(s)	Rmax (Ω)	Rmin (Ω)	Pd typ(W)	Package
SMD0603P002TF/60	0.02	0.08	60	40	0.2	1	12	70	0.5	0603
SMD0603P005TF	0.05	0.15	24	20	0.25	1	35	3	0.5	0603
SMD0603P020TF	0.2	0.5	9	40	1	0.6	3.5	0.55	0.5	0603
SMD0603P050TF	0.5	1	6	40	8	0.1	0.8	0.1	0.5	0603
SMD0603P300L	3	6	6	50	6	5	0.008	0.04	0.5	0603
SMD0805P005TF	0.05	0.15	24	100	0.5	1.5	20	1.5	0.5	0805
SMD0805P050TF/30	0.5	1	30	40	8	0.1	0.85	0.15	0.5	0805
SMD0805P150TF/12	1.5	3	12	50	8	5	0.08	0.013	1.2	0805
SMD1206P005TF	0.05	0.15	60	100	0.3	1.5	50	3.6	0.4	1206
SMD1206P012TF	0.12	0.29	30	100	0.5	0.2	15	1.35	0.4	1206
SMD1206P075TF/30	0.75	1.5	30	100	8	0.2	0.5	0.09	0.6	1206
SMD1206P110TF/24	1.1	2.2	24	40	8	0.1	0.25	0.04	0.8	1206
SMD1206P150TF	1.5	3	6	100	8	1	0.13	0.04	0.8	1206
SMD1206P500TF/12	5	10	12	50	25	2	0.011	0.002	1	1206
SMD1210P005TF	0.05	0.15	60	100	0.25	1.5	50	2.8	0.6	1210
SMD1210P110TF/24	1.1	2.2	24	100	8	0.1	0.21	0.05	0.6	1210
SMD1812P010TF	0.1	0.3	30	100	0.5	1.5	15	0.75	0.8	1812
SMD1812P050TF/30Q	0.5	1	30	100	8	0.15	1	0.15	0.8	1812
SMD1812P075TF/33	0.75	1.5	33	100	8	0.2	0.45	0.09	0.8	1812
SMD1812P110TF/33	1.1	2.2	33	100	8	0.3	0.25	0.05	0.8	1812
SMD1812P450TF/12	4.5	9	12	50	22.5	2	0.016	0.003	1.8	1812
SMD2018P050TF	0.55	1.2	60	100	2.5	3	1	0.2	1	2018
SMD2018P100TF/33	1.1	2.2	33	100	8	0.4	0.36	0.06	1.1	2018
SMD2920P030TF	0.3	0.6	60	100	1.5	3	4.8	0.6	1.5	2920
SMD2920P100TF/60	1	2	60	100	8	0.5	0.41	0.09	1.5	2920
SMD2920P185TF	1.85	3.7	33	100	8	2.5	0.15	0.03	1.5	2920
SMD2920P300TF/33	3	6	33	40	8	25	0.055	0.01	1.5	2920
SMD2920P600TF/24L	6	12	24	50	30	5	0.012	0.0015	1.6	2920
HL250-120	0.12	0.24	250	3	1	2	11	6	1	DIP

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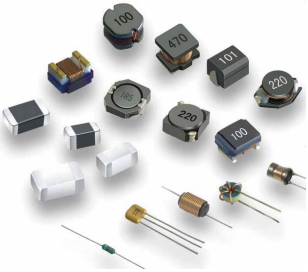
Inductor Explanation



Inductor, also called a coil, choke, or reactor, is a passive two-terminal electrical component that stores energy in a magnetic field when electric current flows through it. An inductor typically consists of an insulated wire wound into a coil around a core.

The basic functions of inductance include filtering, oscillation, delay, notch, etc., which is visually called "through DC, resisting AC".

Common Choke 共模 Part No.	Z	RDC	IDC	Rated Voltage	Withstanding Voltage	Insulation Resistance	Tolerance	Test Freq.
	(Ω)	(Ω)Max.	(mA)	(Vdc)	(Vdc)	(MΩ)(min)	(±%)	(MHz)
LDW21T-900M	90	0.35	330	50	125	10	20	100

SMD Multilayer Ferrite Chip Beads Part No.	Impedance	RDC	Rated Current	Test Freq.
	(Ω)	(Ω)Max.	(mA)Max.	
LM100505T-100Y-N	10	0.025	1000	100 MHz, 200 mV
LM100505T-471Y-N	470	0.5	300	100 MHz, 200 mV
LMPY160808T-101Y-AU	100	0.05	2500	100 MHz, 200 mV
LMPY160808T-221Y-AU	220	0.1	2000	100 MHz, 201 mV
LMPB201209T-102T15	1000	0.12	1500	100 MHz, 201 mV
LMPB201209T-601T15	600	0.04	3000	100 MHz, 201 mV

Molding 一体成型 Part No.	Dimension (mm)	Inductance (μH)	Test Freq.	DCR Typical (mΩ)	Isat Typical (A)	Irms Typical (A)	Irms Mx(A)
LMI201610A-1R0M	2.0*1.6*1.0	1	2MHZ,0.2V	53	3.6	3.1	2.5
LMI252010A-2R2M	2.5*2.0*1.0	2.2	2MHZ,0.2V	87	3	2.5	2.2
LMI04020-4R7M	4*4*2.0	4.7	100KHZ,0.5V	NA	3	2.2	NA
LMI05030-R47M	5*5*3.0	0.47	100KHZ,0.5V	NA	14	10	NA
LMI05030-6R8M	5*5*3.0	6.8	100KHZ,0.5V	NA	5	3	NA
LMI06024-3R3M	6*6*2.4	3.3	100KHZ,0.5V	NA	10	5.5	NA

Winding 绕线 Part No.	Dimension CORE(mm)	Inductance (mH)±30%	DCR (mΩ) ±30%	Rated current (A)	F(mm) Typ
LM2512C532	25*15*12	5.30	27,00	7.60	φ1.10
LM2515C103	25*15*12	10.00	44.00	6.00	φ1.10
LM2515B222	25*15*15	2.2	14.00	9	φ1.0
LM2515B502	25*15*15	5.0	45.00	5	φ1.0
LM1607B402	16*12*7	4.0	0.173	1.7	φ1.0
LM2508B702	25*15*8	7.0	0.12	2.8	φ1.27
LM3113B802	31*19*13	8.0	0.055	5.6	φ1.27
LM3715B363	37*22*15	50.0	0.450	2.3	φ1.27
LM1204S202	12*6*4	2		4	φ0.6
LM1807S203	18*10*7	20		5.0	φ0.7
LM2210S303	22*15*10	30		10	φ1.0

P2P Replace

Semtech Littelfuse Vishay

Infineon Diodes ST Wurth

Rohm Bourns Brightking

Nexperia Amazing AOS

Google Drive

Design

TYPE-C USB2.0 USB3.0 1000M RF

HDMI DVI TF Audio&Video Protection

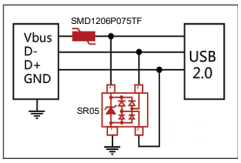
CAN LIN RS232 RS485 GPIO LVDS MIPI

DC5V 12V 24V 48V AC220 AC110 for power

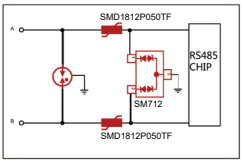
Strawberry board design

Wechat Scan

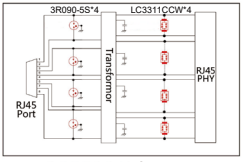
We provide all types of protection for all ports



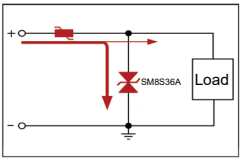
USB2.0



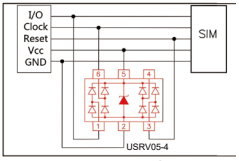
RS485



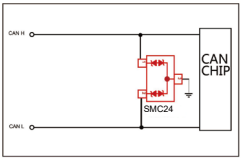
1000M Ethernet



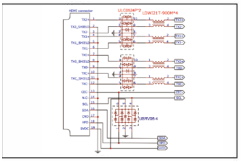
AUTO POWER



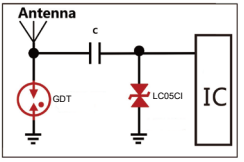
SIM card



CAN BUS



HDMI2.0

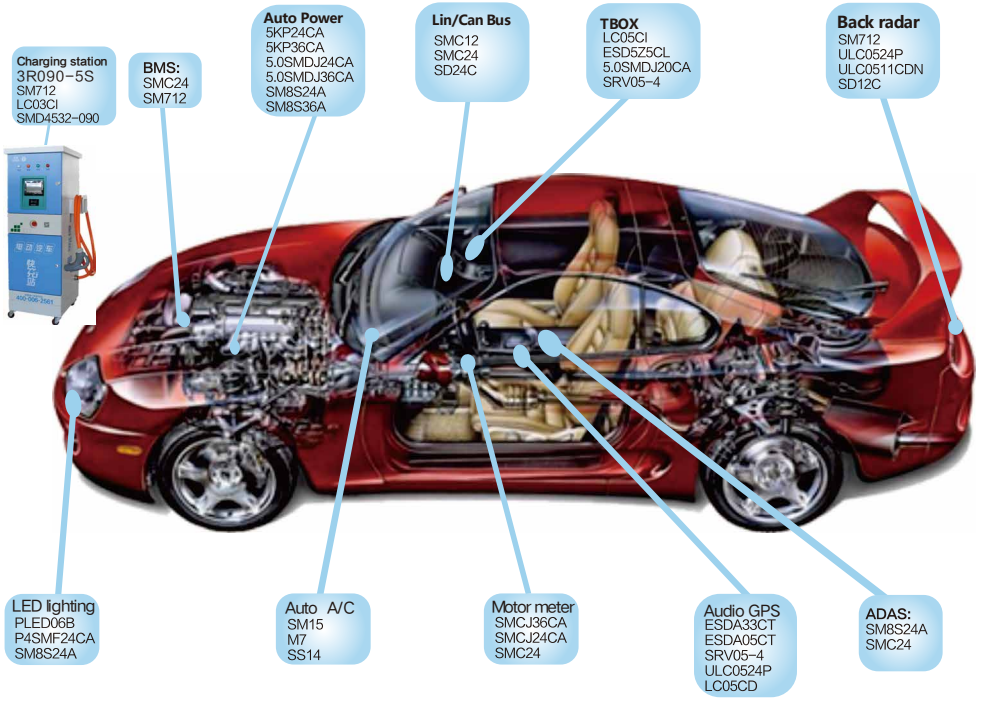


RF tuner

Classic Products For All Telecom Ports ESD And Surge Protection

No.	Interface Name	Transmission Speed(Mbit/s)	Circuit Parasitic Capacitance Requirements (pF)	Recommend Protecting Components		
				Primary protection	Secondary protection	Tertiary protection
1	USB2.0	480	<5			SR05/USRVO5-4
2	USB3.0	4800	<1			ULC0568K
3	USB3.1	10000	<0.5			ULC3324P10 ULC052010P5
4	TYPE-C	10000	<0.5			ULC3324P10 ULC0524P
5	Fast charge USB	480	<3			ULC1654N
6	Fast charge power		—			SD1201P4-3
7	100M Ethernet	100	<5	3R090-5S	HL60-025	SLVU2.8-4/USRVO5-4
8	1000M Ethernet	1000	<3	3R090-5S	HL60-025	LC3311CCW
9	10000M Ethernet	10000	<1	3R090-5S	HL60-025	ULCO542T
10	POE network	100	<5	3R090-5S	HL60-025	SLVU2.8-4 SMCJ58CA
11	HDMI1.3	10200	<1			ULC3304P10
12	HDMI1.4	10200	<1			ULC3304P10
13	HDMI2.0	18000	<0.5			ULCO524P ULC0544P10
14	DISPLAY Video	5400	<1			ULCO524P
15	VGA Analog video	162	<1			ULC0524P/LC0504F
16	DVI digital video	3960	<1			ULCO544M
17	Audio	1.5	<100			SDA05W5/ULC0511CDN
18	LVDS	655	<10			ULC0524P/PUSB3FR4
19	SIM card	7.2	<10			SRV05-4
20	SD card	10	<10			SRV05-4/ESD0506M8
21	MMC card	10	<10			USRV05-4/LC0504F
22	E-SATA	6000	<1			ULCO524P
23	I2C	3.4	<100			ESDA05CP30 ESDA33CP30
24	T1 E1	1.544	<100	P2300SC	HL250-120	SRV05-4 LC03-6
25	RS232	0.2	<50			SD12C SMC12
26	RS485	10	<50	3R090-5S	SMD1812P050TF	SM712
27	CAN bus		<50	3R090-5S	SMD1812P050TF/24	SMC24 SD24C
28	LIN bus		<50	3R090-5S	SMD1812P050TF	SMC24 SD24C
29	xDSL	2	<100			SR70
30	RF/GPS	1000	<1	SMD4532-090NF		ULCO511CDN/ULC0542C13
31	GPIO	5	<100			ESDA05CP30 ESDA33CT30
32	5V DC power		<1000			SMBJ5.0CA SMCJ5.0CA
33	12V DC power	—	<1000			SMBJ12CA SMCJ12CA
34	48V power	—	<1000			SMCJ48CA
35	12V car power	—	<1000			SMCJ22CA SM8S22CA
36	24V car power	—	<1000			SMCJ36CA SM8S36CA
37	220V AC power	—	<1000	2R600-8L	200561KJ	

Vehicle Electronics Protect Solution



Shanghai Leiditech's EMC Laboratory provides free anti-static, anti-surge design and testing for customers, the details are as follows:

content	standard	test range
ESD	IEC61000-4-2	contact±30KV, air±30KV
	ISO10605	contact±30KV, air ±30KV
Surge	ISO7637-2	P1,P2A，P2B，P3,P4,P5A,P5B
	ISO16750-2	
	GB21437-2	

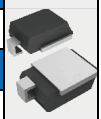
Das Auto. 比亚迪汽车 DFM 中国一汽 江淮汽车 TOYOTA 北汽集团

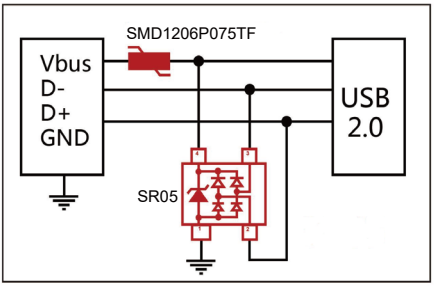
长安汽车 CHANGAN 上海通用汽车 上汽通用五菱 SGMW 中国重汽 SINOTRUK 中联重科 SANY 陕汽

Low Vc TVS For Load-dump Protection

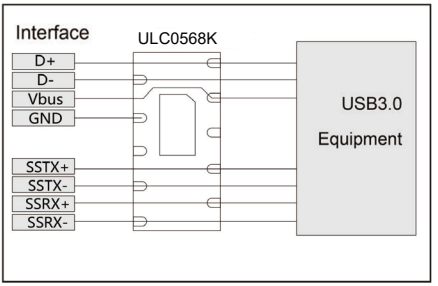
AEC-Q101 Qualified

No.	Part No.		Package	P_{PP}	V_{RMW}	I_R@V_R	Vbr@I_T		I_T	Vc@Ipp	Ipp	ISO16750		Package
	Uni-Polar	Bi-Polar		W	V	μA	min(V)	max(V)	mA	max(V)	A	Test pulse 10C		
1	SMBJ30A	SMBJ30CA	SMB DO-214AA	600	30	1	33.3	36.8	1	48.4	12.4	P5B	Us101V.Us*35V,2Ω，400ms	
2	SMCJ30A	SMCJ30CA	SMC DO-214AB	1500	30	1	33.3	36.8	1	48.4	31	P5B	Us101V.Us*35V,2Ω，400ms	
3	SMDJ28A	SMDJ28CA	SMC DO-214AB	3000	28	1	31.3	34.4	1	45.4	66.1	P5A	Us87V.,4Ω，100ms	
4	SMDJ36A	SMDJ36CA	SMC DO-214AB	3000	36	1	40	44.2	1	58.1	51.6	P5A	Us123V.,4Ω，100ms	
5	5.0SMDJ22A	5.0SMDJ22CA	SMC DO-214AB	5000	22	1	24.4	28	5	35.5	144	P5A	Us87V.,2Ω，100ms	
6	5.0SMDJ22A	5.0SMDJ22CA	SMC DO-214AB	5000	36	1	40	44.2	1	58.1	87.8	P5A	Us87V.,2Ω，100ms	
7	5.0SMDJ30A	5.0SMDJ30CA	SMC DO-214AB	5000	30	1	33.3	38.3	5	48.4	105	P5A	Us123V.,2Ω，100ms	
8	SM6S20A	SM6S20CA	DO-218AB	4600	20	5	22.2	24.5	5	32.4	142	P5A	Us101V.,2Ω，400ms	
9	SM6S22A	SM6S22CA	DO-218AB	4600	22	5	24.4	26.9	5	35.5	130	P5A	Us101V.,2Ω，400ms	
10	SM6S36A	SM6S36CA	DO-218AB	4600	36	5	40	44.2	5	58.1	79	P5A	Us202V.,8Ω，350ms	
11	SM8S24A	SM8S24CA	DO-218AB	6600	24	5	26.7	29.5	5	38.9	170	P5A	Us101V.,0.5Ω，350ms	
12	SM8S33A	SM8S33CA	DO-218AB	6600	33	5	36.7	40.6	5	53.3	124	P5A	Us202V.,4Ω，350ms	
13	SM8S36A	SM8S36CA	DO-218AB	6600	36	5	40	44.2	5	58.1	114	P5A	Us202V.,4Ω，350ms	
14	SM10S33A	SM10S33CA	DO-218AB	8000	33	5	36.7	40.6	5	53.3	124	P5A	Us202V.,2Ω，350ms	
15	SM10S36A	SM10S36CA	DO-218AB	8000	36	5	40	44.2	5	58.1	114	P5A	Us202V.,2Ω，350ms	
16	P6S24A	P6S24CA	R6 P600	6600	24	1	26.7	30.7	1	38.9	170	P5A	Us101V.,2Ω，400ms	
17	P6S33A	P6S33CA	R6 P600	6600	33	1	36.7	42.2	1	53.3	124	P5A	Us202V.,8Ω，350ms	
18	P6S36A	P6S36CA	R6 P600	6600	36	1	40	46	1	58.1	114	P5A	Us202V.,8Ω，350ms	
19	P8S24A	P8S24CA	R6 P600	8000	24	5	26.7	29.5	5	38.9	206	P5A	Us101V.,1Ω，350ms	
20	P8S26A	P8S26CA	R6 P600	8000	26	5	28.9	31.9	5	42.1	190	P5A	Us101V.,1Ω，350ms	
21	P8S33A	P8S33CA	R6 P600	8000	33	5	36.7	40.6	5	53.3	150	P5A	Us202V.,4Ω，350ms	
22	P8S36A	P8S36CA	R6 P600	8000	36	5	40	44.2	5	58.1	138	P5A	Us202V.,4Ω，350ms	
23	P15S30A	P15S30CA	R6 P600	15000	30	200	33.3	38.3	1	48.4	310	P5A	Us202V.,2Ω，350ms	
24	P15S33A	P15S33CA	R6 P600	15000	33	200	36.7	42.2	1	53.3	281	P5A	Us202V.,2Ω，350ms	
25	P15S36A	P15S36CA	R6 P600	15000	36	200	40	46	1	58.1	258	P5A	Us202V.,2Ω，350ms	

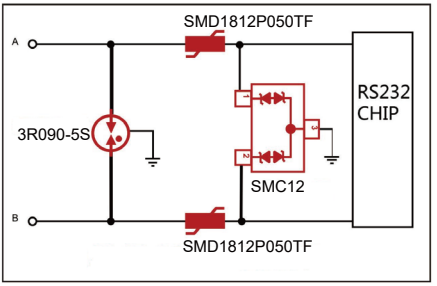




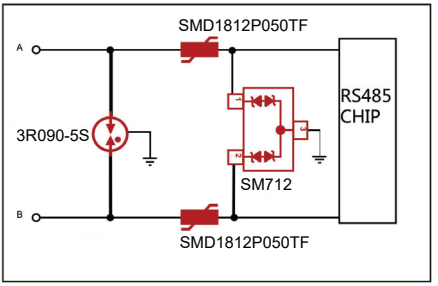
USB2.0



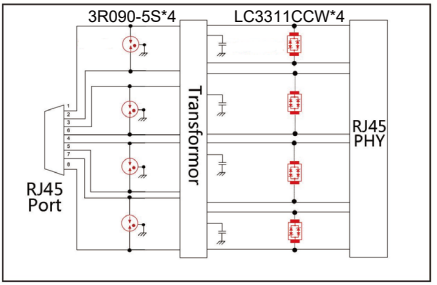
USB3.0



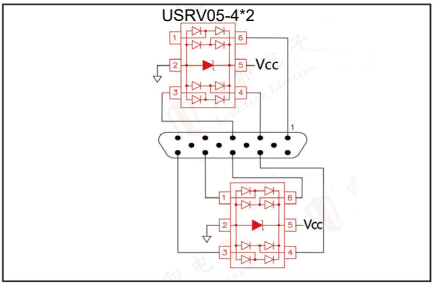
RS 232



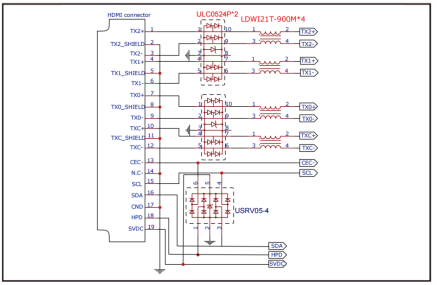
RS485



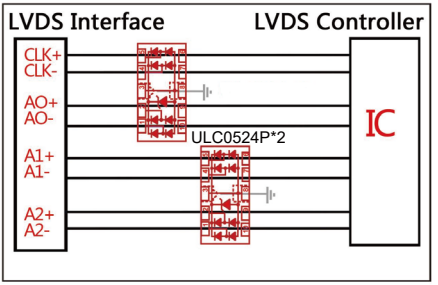
1000M Ethernet



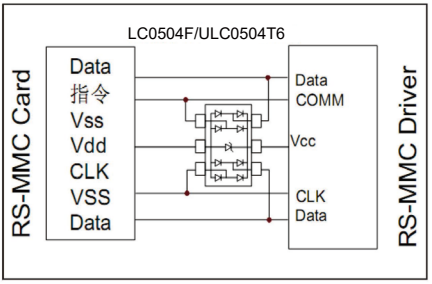
VGA



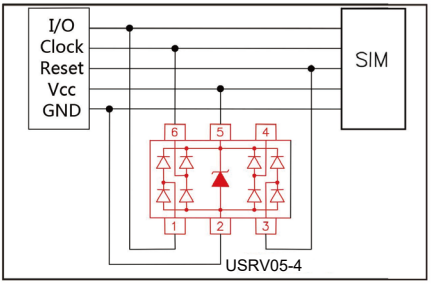
HDMI2.0



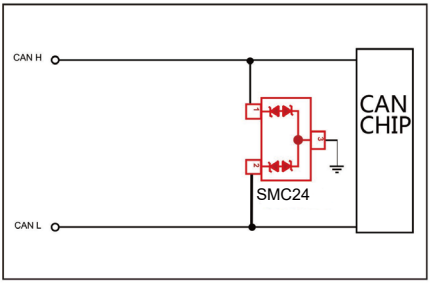
LVDS



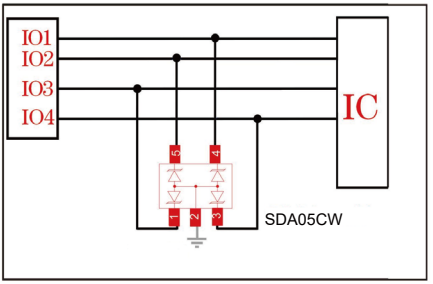
MMC card



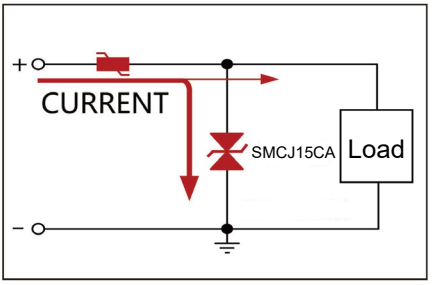
SIM card



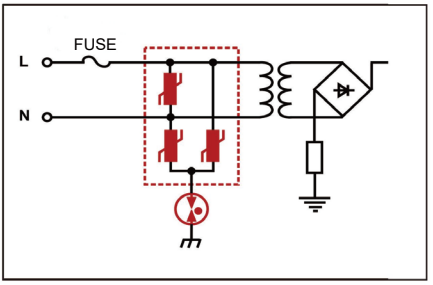
CAN BUS



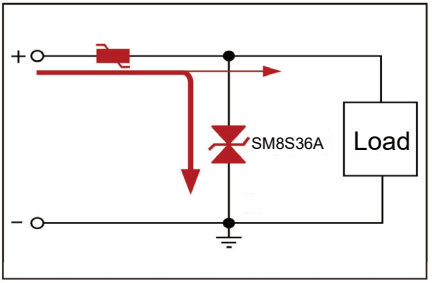
IO PORT



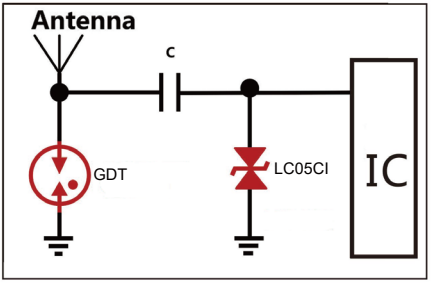
DC POWER



AC POWER

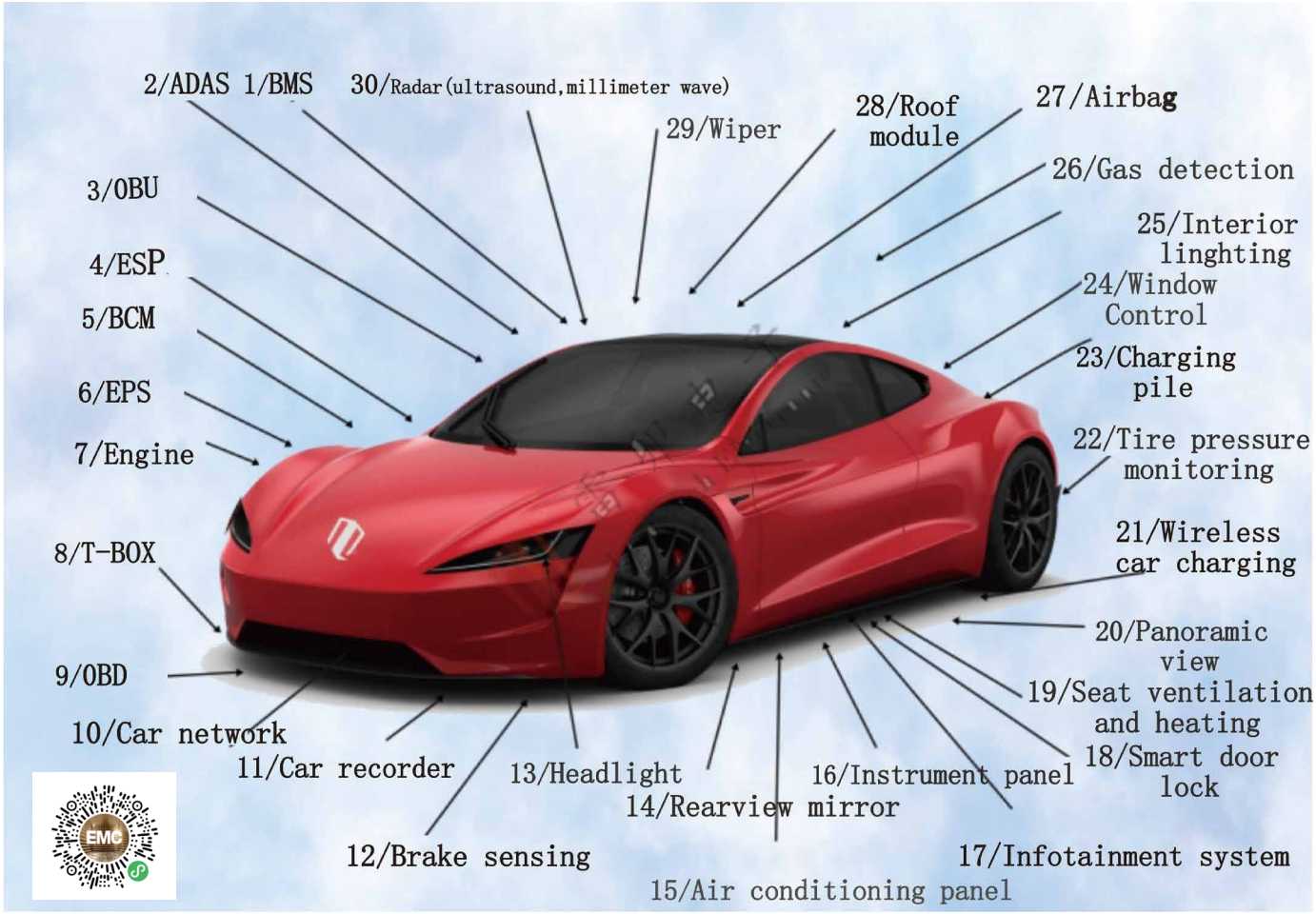


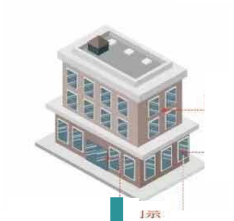
AUTO POWER



RF tuner

Leiditech


2/ADAS 1/BMS
30/Radar(ultrasound,millimeter wave)
29/Wiper
28/Roof module
27/Airbag
26/Gas detection
25/Interior linghting
24/Window Control
23/Charging pile
22/Tire pressure monitoring
21/Wireless car charging
20/Panoramic view
19/Seat ventilation and heating
18/Smart door lock
17/Infotainment system
16/Instrument panel
15/Air conditioning panel
14/Rearview mirror
13/Headlight
12/Brake sensing
11/Car recorder
10/Car network
9/OBD
8/T-BOX
7/Engine
6/EPS
5/BCM
4/ESP
3/OBU



1 Hospital monitoring host

2 Health all-in-one machines

3 Intelligent access control machines

4 Intelligent bed

5 Mattresses
(air massage,wet urine alarm)

6 Bed belt

7 Electric lifting toliet

8 Will alarm diapers

9 Intelligent hip
washing machine

10 Assisted-lifting sofa

11 Intelligent medicine boxes

12 AI care sensor

13 Electrocardiogram
recorder

14 Neuromyoelectyic
stimulator

15 Brain Function Magnetic
Therapy Rehabilitation Instrument

16 Magic Mirror

17 Intelligent
sphygmomanometer

18 Intelligent Blood Glucose
Oximeter

19 Electric
Wheelchairs

20 Smart cruthes

21 Retirement Watch

22 Smart Bracelet

23 Fall alarm

24 Millimeter wave
radar fall detector

25 Matchman intelligent
care system

26 Fire sensors

27 Gate magnet

28 Overflow alarm

29 Intelligent call
machines SOS

30 Portable medical
examination machine

31 Health management
machine

32 Stair climber

33 Intelligent ordering

34 Intelligent hair
washing machine

Partners


CRSC
中国通号


CHANGHONG


GREE格力


Midea


Das Auto.


智芯
SMART CHIP


Hisense
海信


小米


哈罗单车


BYD


科大讯飞
iFLYTEK


STAR-NET
星网锐捷


CVTE
Dream·Future


陕汽重卡


JOHNSON


Honeywell
霍尼韦尔


富士康
FOXCONN


ECOVACS


长安汽车
CHANGAN AUTO


HUAQIN
华勤通讯


LUXSHARE


flex
LIVE SMARTER

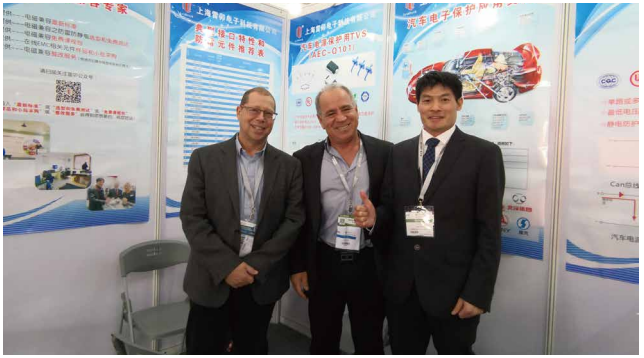

JABIL


TCL





Factory Display





Customer Interaction

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WhatsApp