

ESD Protection Diode for Smartphone



Accountability



Customer Focus



Mutual Trust and
Collaboration

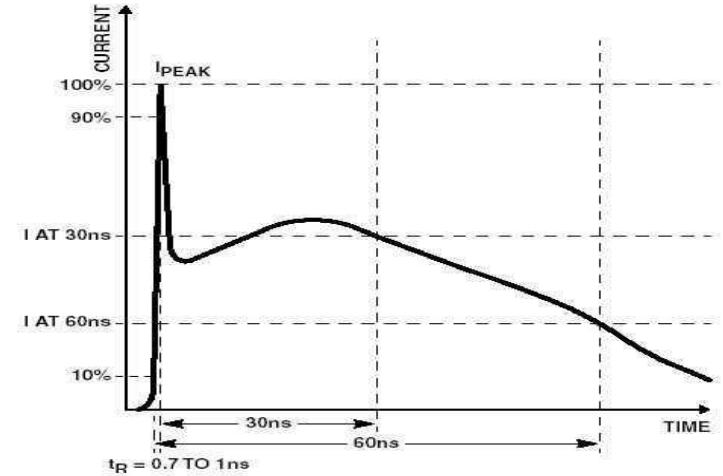
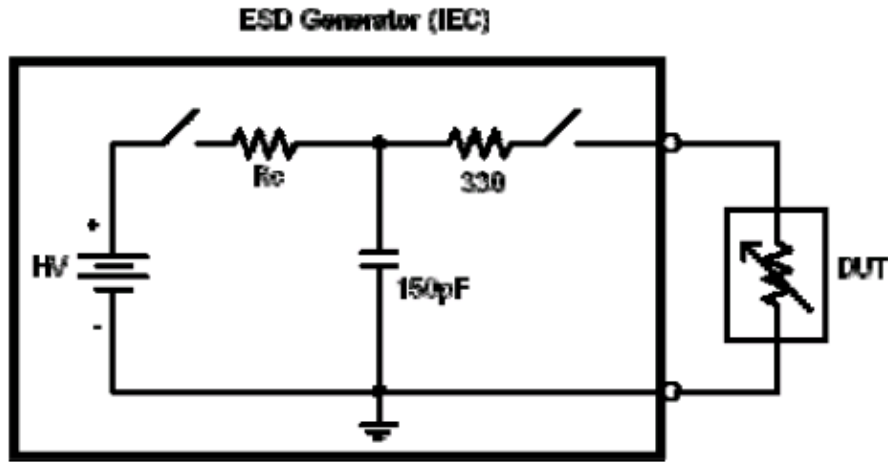


Innovation



Learning and
Growth

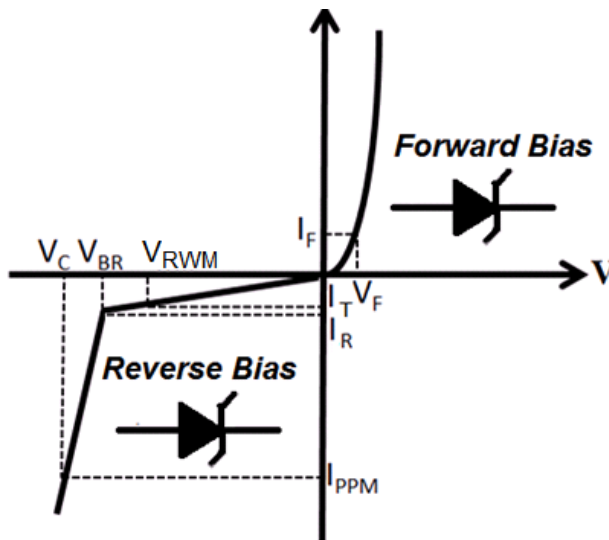
Electrostatic Discharge IEC61000-4-2



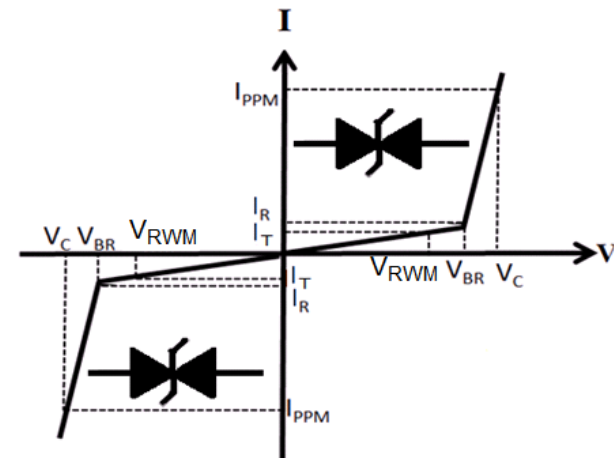
Level	Test Voltage Contact Discharge (kV)	Peak Current $\pm 10\%$ (A)	Current @ 30ns (A)	Current @ 60ns (A)
1	2	7.5	4	2
2	4	15	8	4
3	6	22.5	12	6
4	8	30	16	8

Transient Suppression

- Constant advances in semiconductor process technologies make the design of protection very challenging.
- Protection circuit must ***divert transient current and clamp transient voltage*** below the failure threshold of the protected.



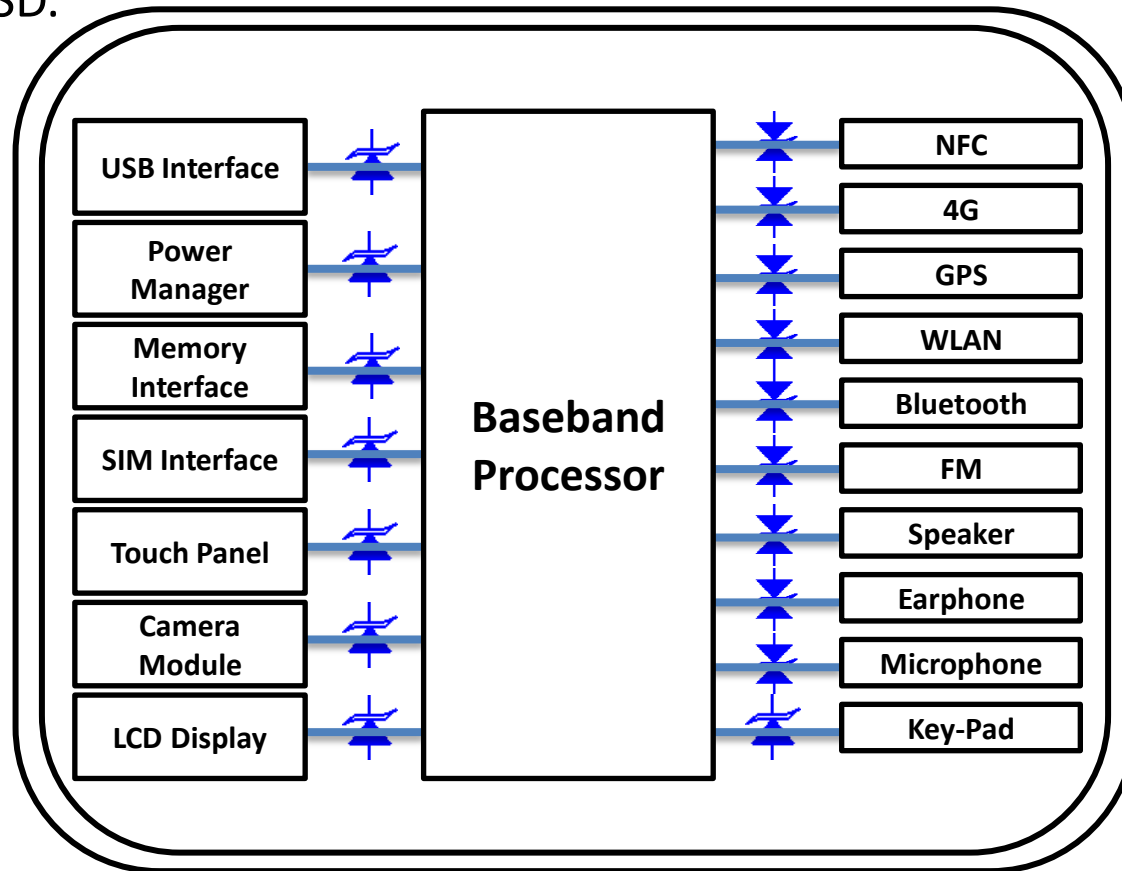
Uni-directional



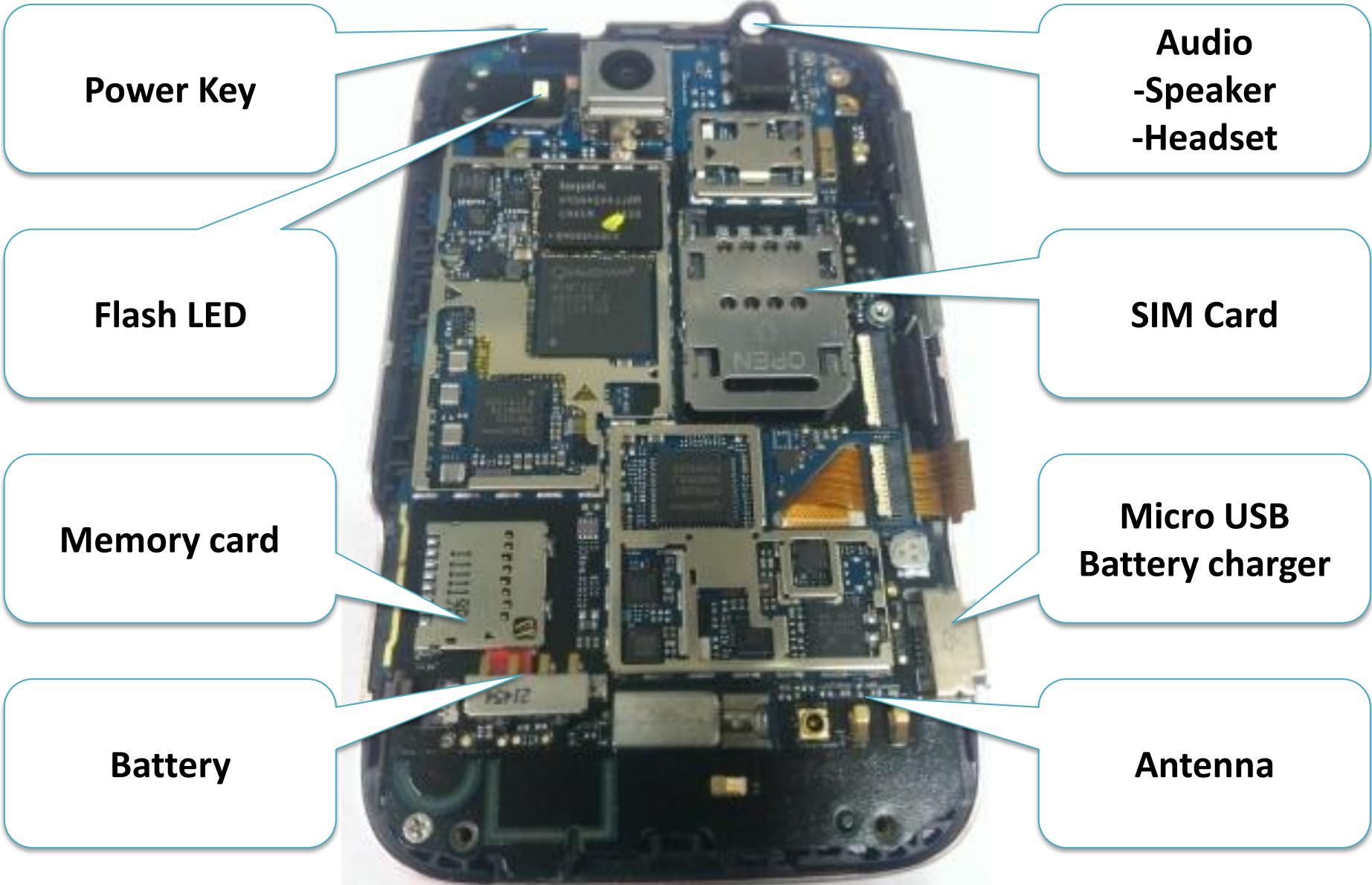
Bi-directional

Smartphone Block diagram

Spaces between components are becoming smaller since smartphone is thinner than before so modules inside the phone are easily impacted by ESD. The places where a ESD protector is added in this picture are the ones that are frequently impacted by ESD.



Smartphone Parts



Power Key

**Audio
-Speaker
-Headset**

Flash LED

SIM Card

Memory card

**Micro USB
Battery charger**

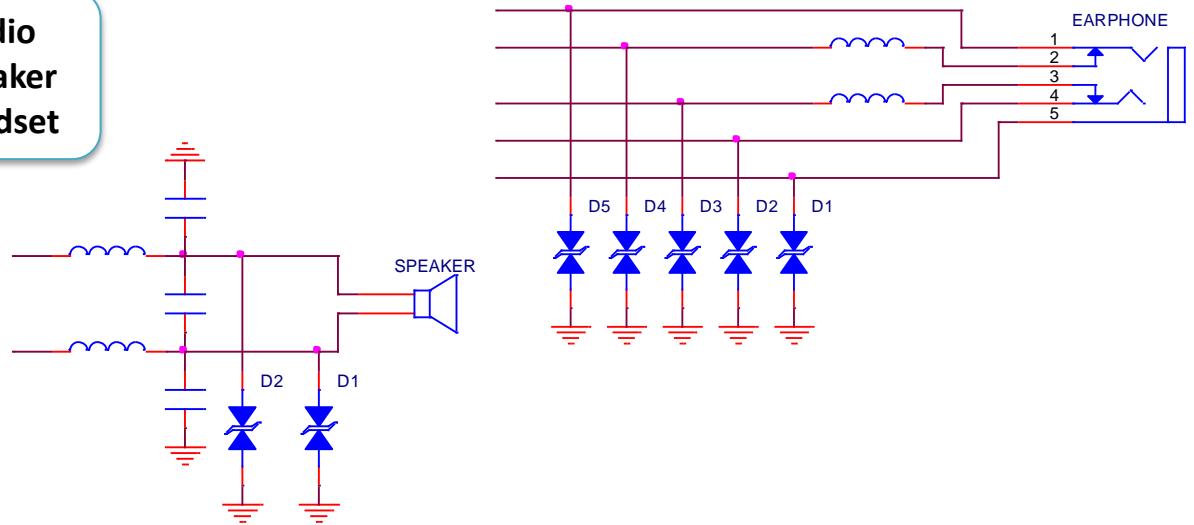
Battery

Antenna

Audio Interface



**Audio
-Speaker
-Headset**

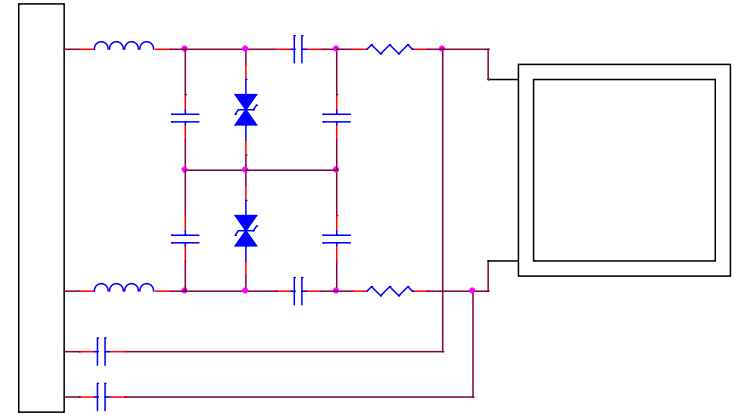
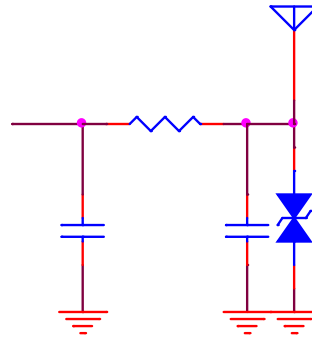


Part Number	Direction	$V_{RWM}(V)$	$I_R(\mu A)$	$C_j(pF)Max.$	$I_{pp}(A)$	Package
			$V_R=V_{RWM}$	$V_R=0V, f=1MHz$	Max.	
PEC3105M1PQ	Bi	5	1	15	5	DFN1006-2L
PEC3205M2PQ	Bi	5	1	25	5	DFN1006-3L
PEC3705M1Q	Bi	5	1	70	15	DFN 2L

Antenna Interface

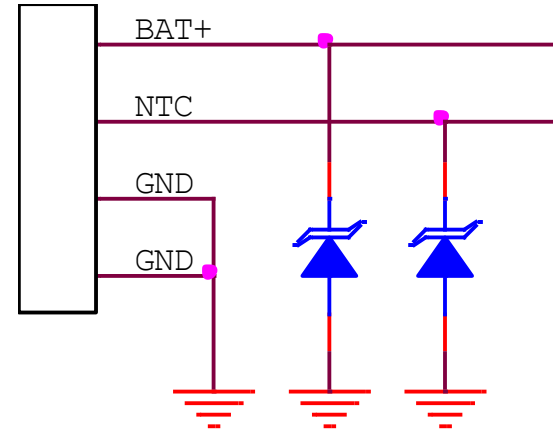


Antenna



Part Number	Direction	$V_{RWM}(V)$	$I_R(\mu A)$	$C_j(pF)Max.$	$I_{pp}(A)$	Package
			$V_R=V_{RWM}$	$V_R=0V, f=1MHz$	Max.	
PEC1605M1Q	Bi	5	0.075	0.6	2	DFN 2L
PEC1918M1PQ	Bi	18	1	0.9	2.5	DFN1006-2L

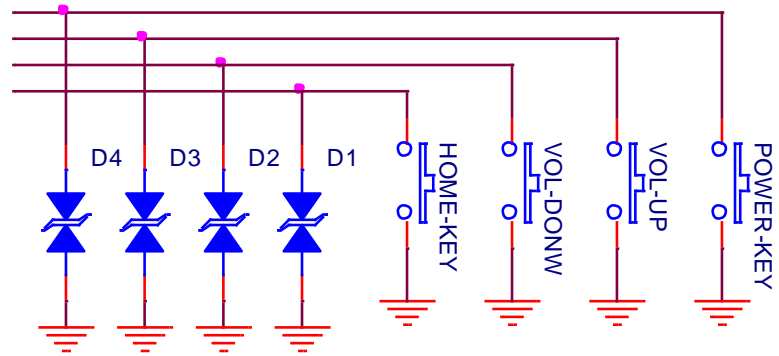
Battery Interface



Part Number	Direction	$V_{RWM}(V)$	$I_R(\mu A)$	$C_j(pF)Max.$	$I_{pp}(A)$	Package
			$V_R=V_{RWM}$	$V_R=0V, f=1MHz$	Max.	
PEC4104M1PQ	Bi	4.5	1	100	30	DFN1006-2L
PEC4304C1PCF	Bi	4.5	2	300	130	SOD-323

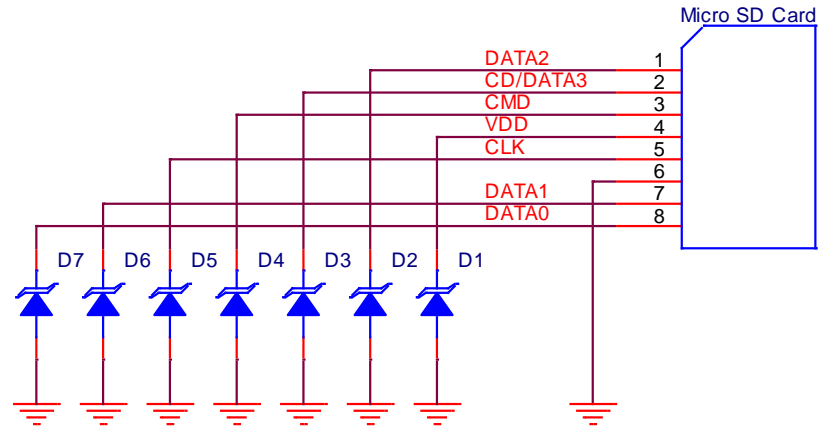
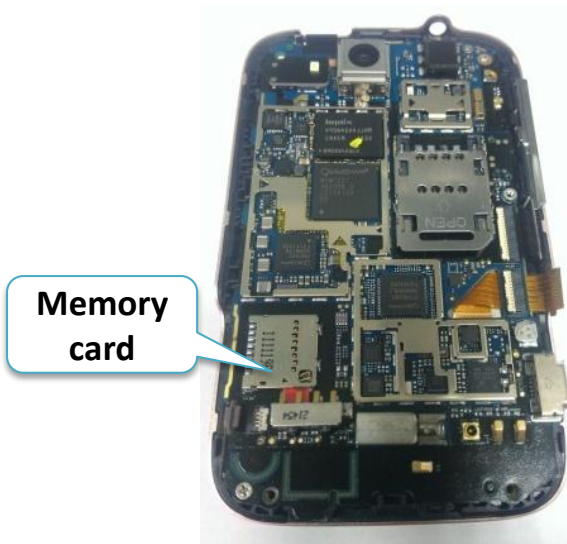
Function	Part Number	Package
Zener Diode	PZS525V3BPCF	SOD-323
Zener Diode	PZS525V3BPES	SOD-523

Keypad Interface



Part Number	Direction	$V_{RWM}(V)$	$I_R(\mu A)$	$C_j(pF)Max.$	$I_{pp}(A)$	Package
			$V_R=V_{RWM}$	$V_R=0V, f=1MHz$	Max.	
PEC3103M1PQ	Bi	3.3	1	15	5	DFN1006-2L
PEC3105M1PQ	Bi	5	1	15	5	DFN1006-2L
PEC3205M2PQ	Bi	5	1	25	5	DFN1006-3L

Memory Card Interface

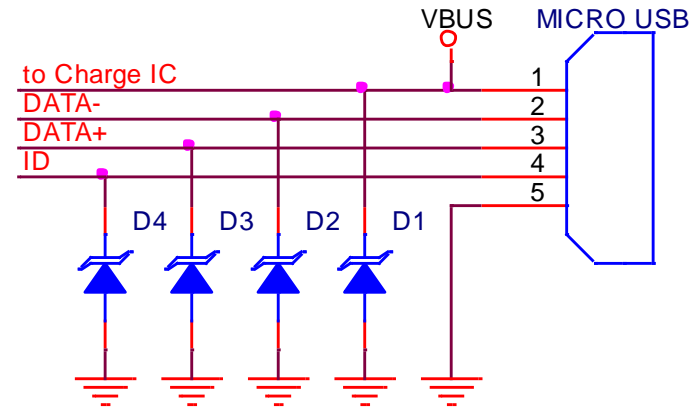


Part Number	Direction	$V_{RWM}(V)$	$I_R(\mu A)$	$C_j(pF)Max.$	$I_{pp}(A)$	Package
			$V_R=V_{RWM}$	$V_R=0V, f=1MHz$	Max.	
PE2105S1PQ	Uni	5	1	1.0	5	DFN0603
PE1905M1PQ	Uni	5	1	0.9	5	DFN1006-2L
PE1905M2PQ	Uni	5	1	0.9	5.5	DFN1006-3L
PEC1605M1Q	Bi	5	0.075	0.6	2	DFN 2L

USB Interface

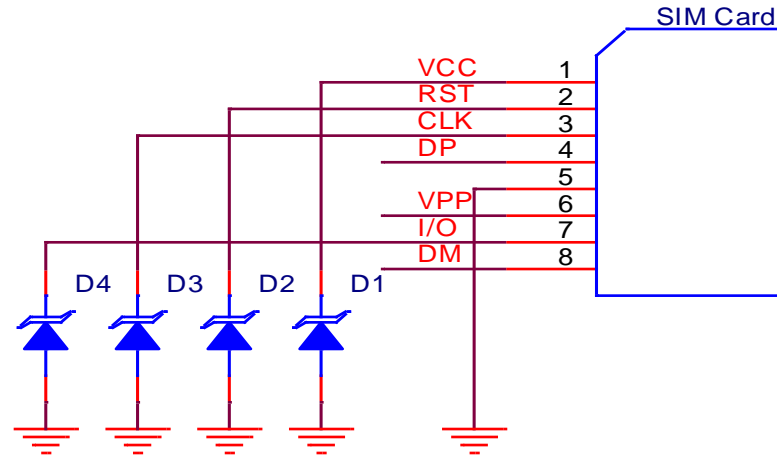


**Micro USB
Battery charger**



Part Number	Direction	$V_{RWM}(V)$	$I_R(\mu A)$	$C_j(pF)Max.$	$I_{pp}(A)$	Package
			$V_R=V_{RWM}$	$V_R=0V, f=1MHz$	Max.	
PE2105S1PQ	Uni	5	1	1.0	5	DFN0603
PE1905M1PQ	Uni	5	1	0.9	5	DFN1006-2L
PEC1605M1Q	Bi	5	0.075	0.6	2	DFN 2L
PEC4507C1PAL	Bi	7	1	550	80	SOD-123FL
PEC4312C1PAL	Bi	12	1	380	100	SOD-123FL
PEC4215C1PAL	Bi	15	1	250	80	SOD-123FL

SIM Card Interface



Part Number	Direction	$V_{RWM}(V)$	$I_R(\mu A)$	$C_j(pF)$	$I_{pp}(A)$	Package
			$V_R=V_{RWM}$	$V_R=0V, f=1MHz$	Max.	
PEC3105M1PQ	Bi	5	1	15	5	DFN1006-2L
PEC3205M2PQ	Bi	5	1	25	5	DFN1006-3L

ESD Nomenclature

PE C 1 6 05 M 4 Q

PE
PANJIT ESD

Directional Code
NA: UNI
C: BI

Product Group Name
1: Super Hi-Speed(0.1-0.9pF)
2: Hi-Speed(1-9pF)
3: Low-Speed(10-90pF)
4: Hi-Surge(100-900pF)

CJ Level
1: 0.1 、 1 、 10 、 100
...
9: 0.9 、 9 、 90 、 1000(Over 1K: H)

VRWM
One Code: Tens
Two Code: Digits(Direct dots rounding)

Package Code

Channel

Product Code
DFN Serial:
1CH:
S: DFN0603
M: DFN-2L
L: DFN1610-2L
X: DFN2020-3L
2CH:
M: DFN-3L
4CH:
M: DFN2510-10L
8CH:
S: DFN3810-9L
M: DFN5515-14L
L: DFN5515-18L
Other: C

Signal ZENER Nomenclature

PZ S 5 2 5V3 B Q

PZ
PANJIT ZENER <1W

Product Group Name
S: Single
D: Dual
C: Dual Com Cath
A: Dual Com Anode
I: Isolated

PD Code:
100mW: 1
200mW: 2
300mW: 3

IZT Code:
50uA: 1
5mA: 2
20mA: 3

Package Code

Tolerance Code
A: 2%
B: 5%
C: 10%

VZ Target
V: Decimal point

General Items - ESD

Product Group	Part Number	Package	UNI/BI	V _{RWM}	V _{BR} (V)@IT		IT	I _R	C _J (Max.)	I _{PP}
				V	V Min.	V Max.		mA	@V _{RWM}	
Super Hi-Speed (GHz)	PE1905C1PES	SOD-523	UNI	5	5.4	8.5	1	1	0.9	5
	PE1905M1PQ	DFN1006-2L	UNI	5	5.4	8.5	1	1	0.9	5
	PE1905M2PQ	DFN1006-3L	UNI	5	5.4	8.5	1	1	0.9	5
	PEC1605M1Q	DFN 2L	BI	5	6.8	11.2	1	0.075	0.6	2
	PEC1918M1PQ	DFN1006-2L	BI	18	19	24	1	1	0.9	2
Hi-Speed (>100MHz)	PE2105S1PQ	DFN0603	UNI	5	5.6	-	1	1	1	5
	PEC2305S1Q	DFN0603	BI	5	5.5	10	1	0.5	3.5	2
Low-Speed (<100MHz)	PEC3103M1PQ	DFN1006-2L	BI	3.3	4.5	-	1	1	15	5
	PEC3105M1PQ	DFN1006-2L	BI	5	5.6	7.8	1	1	15	5
	PEC3205M2PQ	DFN1006-3L	BI	5	5.6	7.8	1	1	25	5
	PEC3705M1Q	DFN 2L	BI	5	6	-	1	1	70	15
Hi-Surge	PE4507C1PCF	SOD-323-3	UNI	7	7.5	9.5	1	1	550	50
	PE4H07X1PQ	DFN2020-3L	UNI	7	7.5	10	1	1	2800	180
	PE4412C1PCF	SOD-323-3	UNI	12	14.5	16.5	1	1	400	50
	PE4H12X1PQ	DFN2020-3L	UNI	12	13.5	15.5	1	1	1500	80
	PE4315C1PCF	SOD-323	UNI	15	16	19	1	1	350	30
	PEC4104M1PQ	DFN1006-2L	BI	4.5	4.6	-	50	1	100	30
	PEC4304C1PCF	SOD-323-3	BI	4.5	4.6	-	1	2	350	130
	PEC4507C1PAL	SOD-123FL	BI	7	7.4	8.6	1	1	550	80
	PEC4312C1PAL	SOD-123FL	BI	12	13	15	1	1	380	100
PEC4215C1PAL	SOD-123FL	BI	15	17	20	1	1	250	80	

General Items - Zener

Part Number	Package	P _D mW	V _Z (V)			I _{ZT} mA	Z _{ZT@1mA} Ω Max.	I _R (VR=4.2V) uA	C (Max.) (VR=0V) pF Typ.
			V Min.	V Typ.	V Max.				
PZS525V3BPCF	SOD-323	500	5.1	5.35	5.6	5	55	5	300
PZS525V3BPES	SOD-523	500	5.1	5.35	5.6	5	55	5	300