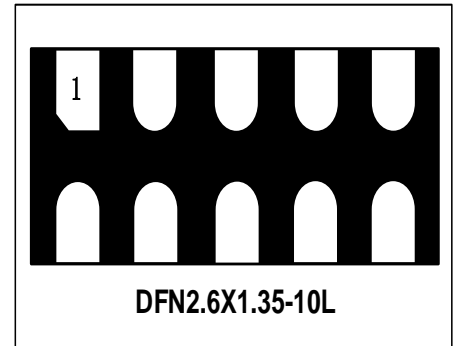


Features

- Two Differential Channels Common-Mode EMI Filter with Integrated ESD Protection
- Large Differential Mode Bandwidth with Cutoff Frequency:4 GHz
- High Common Mode Stop Band Attenuation
- Provides ESD Protection to IEC61000-4-2 Level 4, ± 15 kV Contact Discharge
- Low Channel Input Capacitance Provides Superior Impedance Matching Performance
- Low Channel Resistance: 6.0Ω
- Maximum Package Height: 0.5 mm



IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2 (ESD) ± 20 kV (air), ± 15 kV (contact)+
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 4A (8/20 μ s)

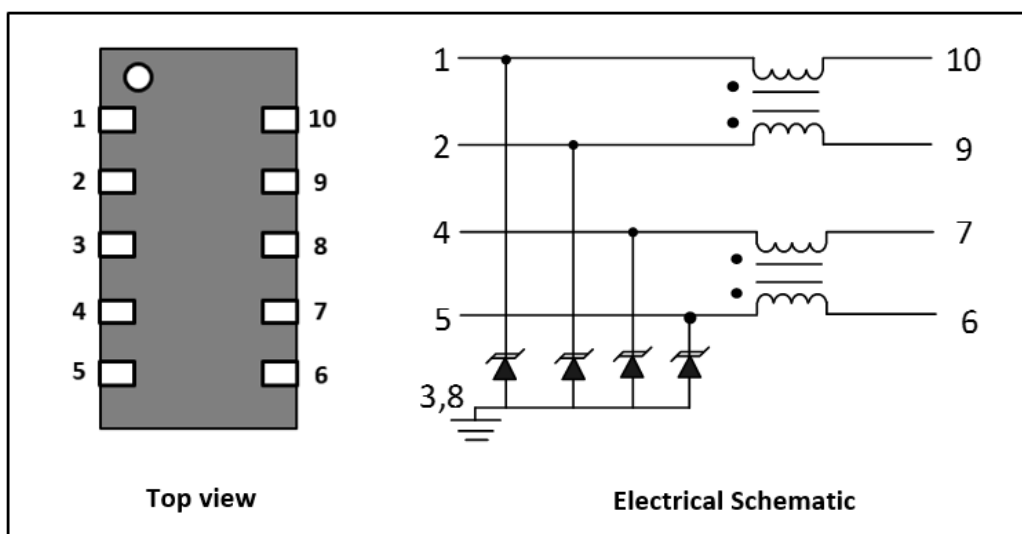
Mechanical Characteristics

- 1.35 x 2.6 mm DFN-10L package
- Pb-Free Package Marking : Marking Code
- Packaging : Tape and Reel per EIA 481
- RoHS Compliant

Applications

- USB 3.0
- HDMI 1.3/1.4/2.0 /DVI Display
- MIPI D-PHY/M-PHY
- eSATA, MHL

Schematic & PIN Configuration



Pin Description

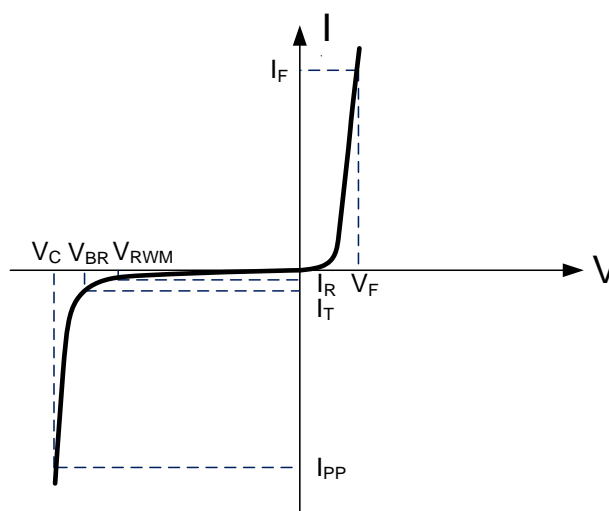
PIN number	Description	PIN number	Description
1	In_1+ (to Connector)	6	Out_2- (to IC)
2	In_1- (to Connector)	7	Out_2+ (to IC)
3	GND	8	GND
4	In_2+ (to Connector)	9	Out_1- (to IC)
5	In_2- (to Connector)	10	Out_1+ (to IC)

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power ($t_p = 8/20\mu s$)	P_{PP}	60	Watts
Peak Pulse Current($t_p = 8/20\mu s$)	I_{PP}	4	A
DC Current per Line	I_{LINE}	100	mA
Operating Temperature	T_J	-55 to + 85	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Parameters (T=25°C)

Symbol	Parameter
I_{PP}	Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Reverse Stand-Off Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_F	Forward Current
V_F	Forward Voltage @ I_F



Electrical Characteristics

WECM5412P						
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Reverse Stand-Off Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	5.6		9	V
Reverse Leakage Current	I_R	$V_{RWM}=5V, T=25^{\circ}C$			500	nA
Forward Voltage	V_F	$I_F=10mA$	0.5		1.5	V
Channel Input Capacitance to Ground(Pins 1, 2, 4, 5 to Pins 3, 8)	C_{IN}	$V_R=0V, f=1MHz$		0.8	1.0	pF
Clamping Voltage	V_C	$I_{PP}=1A, t_p=8/20\mu s$		10	15	V
ESD Clamping Voltage ¹	V_C	$I_{PP}=4A$ $t_p=0.2/100ns$		9.5		V
ESD Clamping Voltage ¹	V_C	$I_{PP}=16A$ $t_p=0.2/100ns$		15.5		V
Dynamic Resistance ^{1,2}	R_{DYN}	TLP=0.2/100ns I/O to Gnd		0.5		Ω
Channel Resistance(Pins 1-10, 2-9, 4-7 and 5-6)	R_{CH}			6.0		Ω
Differential Mode Cut-off Frequency	f_{3dB}	50 Ω Source and Load Termination		4.0		GHz
Common Mode Stop Band Attenuation	F_{atten}	@ 1GHz		23		dB

Note:

1. TLP Setting : $t_p=100ns, t_f=0.2ns, I_{TLP}$ and V_{TLP} sample window: $t_1=70ns$ to $t_2=90ns$.
2. Dynamic resistance calculated from $I_{PP}=4A$ to $I_{PP}=16A$ using "Best Fit"

Typical Characteristics

Figure 1: Differential attenuation versus frequency (Z0 diff = 100 Ω)

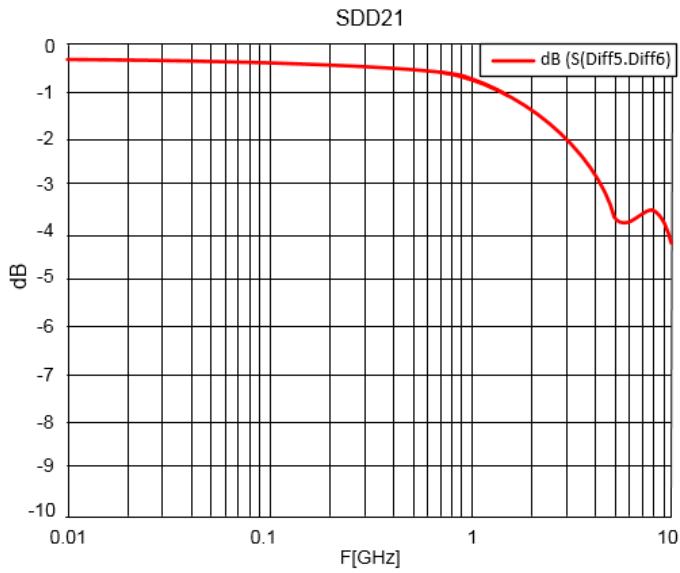


Figure 2: Common mode attenuation versus frequency (Z0 com = 50 Ω)

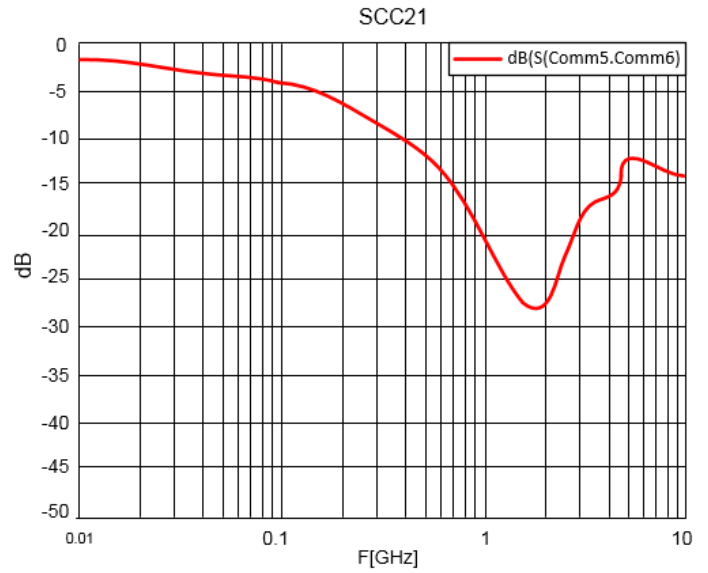


Figure 3: USB 3.0 Eye Diagram Test for 5Gbps Data Rate

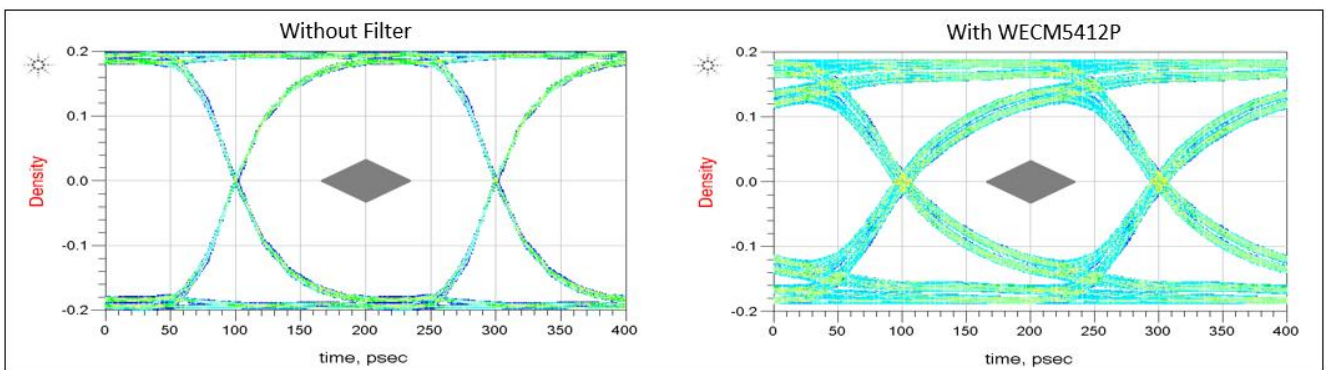


Figure 4: HDMI 2.0 Eye Diagram Test for 6Gbps Data Rate

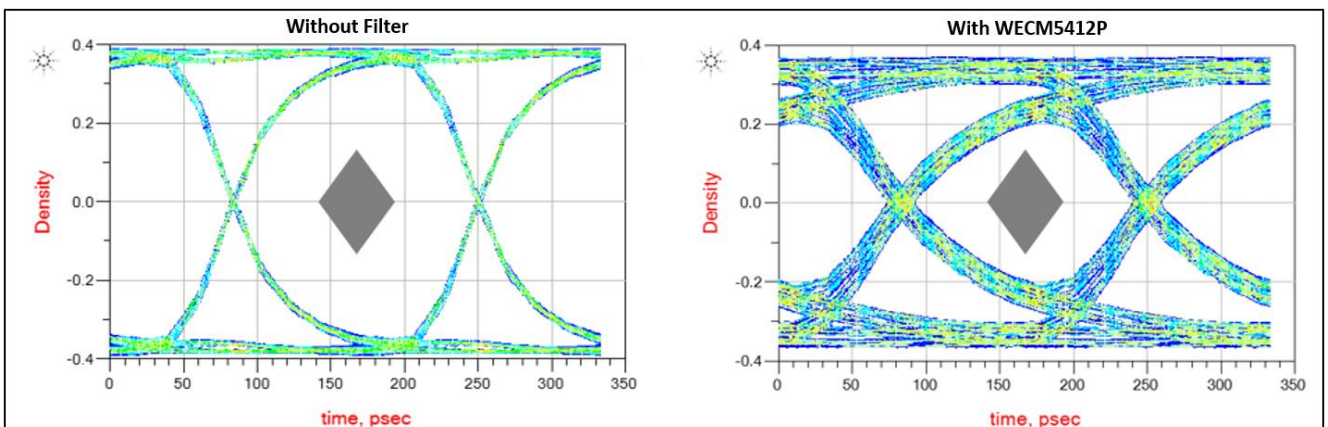


Figure 5: Peak Pulse Power vs. Pulse Time

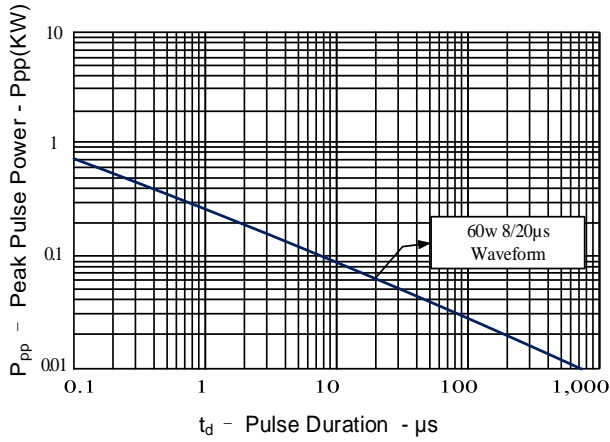


Figure 6: Power Derating Curve

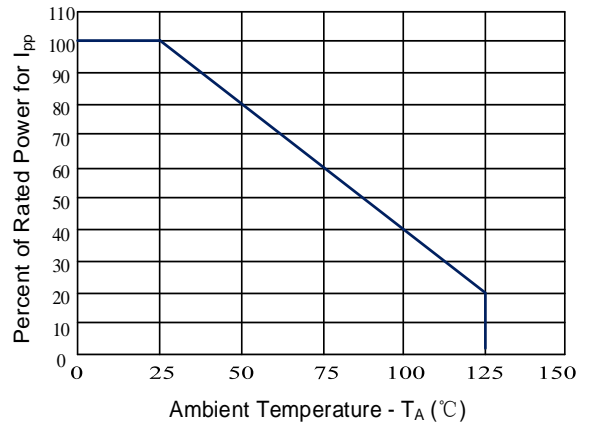


Figure 7: Pulse Waveform

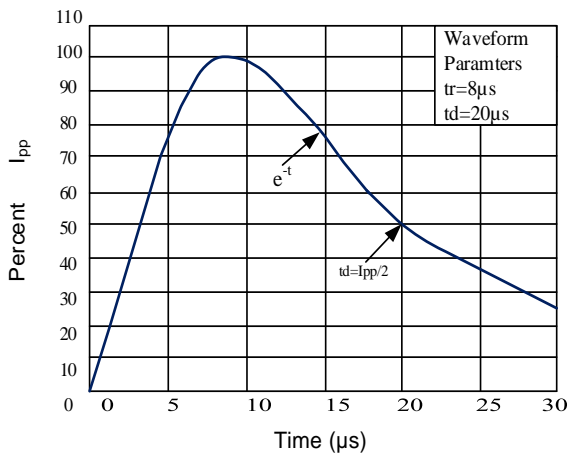


Figure 8: Clamping Voltage vs. Peak Pulse Current

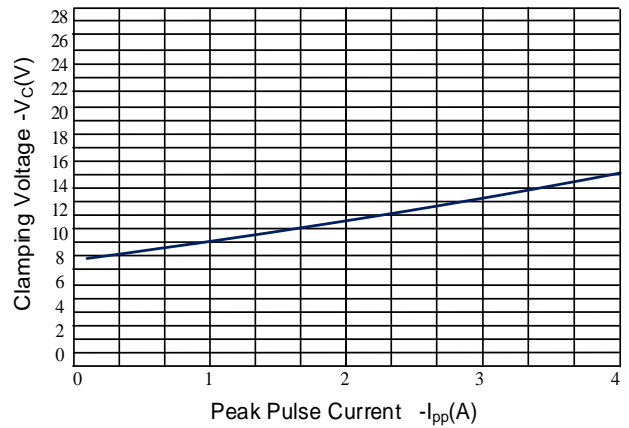


Figure 9: Capacitance vs. Reverse Voltage

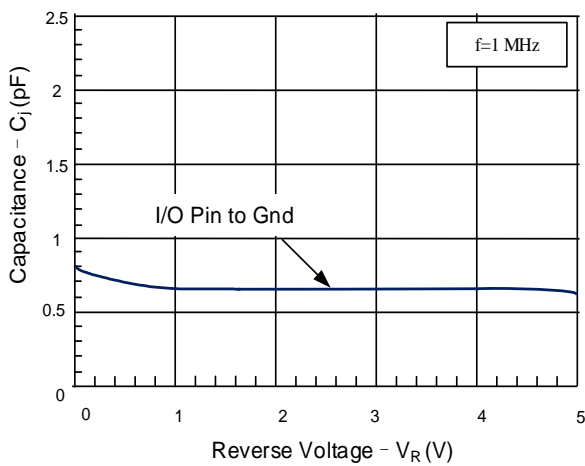
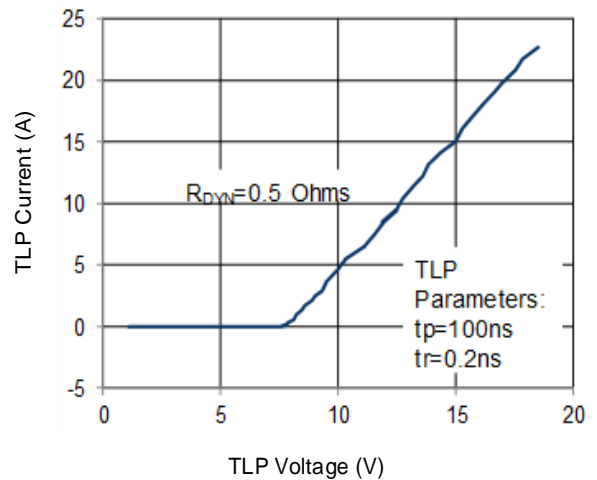
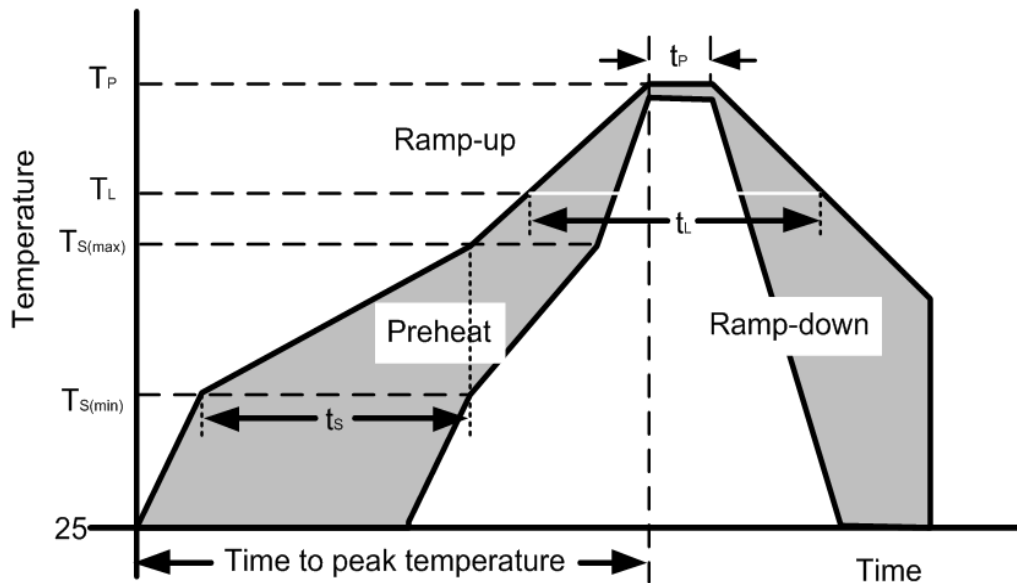


Figure 10: TLP I-V Curve



Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	Temperature Min ($T_{S(min)}$)	150°C
	Temperature Max ($T_{S(max)}$)	200°C
	Time (min to max) (t_s)	60 – 190 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		5°C/second max
$T_{S(max)}$ to T_L —Ramp-up Rate		5°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260+0/-5 °C
Time within actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280°C



Outline Drawing –DFN-10L

DFN2.6X1.35-10L

SYMBOL	MILLIMETERS		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
b	0.15	0.20	0.25
D	2.55	2.60	2.65
E	1.30	1.35	1.40
e	0.50 BSC		
L	0.40	0.50	0.60

NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

Footprint (dimensions in mm)

NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING TO ENSURE YOUR COMPANYS MANUFACTURING GUIDELINES ARE MET.

Marking Codes

Part Number	WECM5412P	
Marking Code		CM1=Specific Device Code XXX= Lot Code

Package Information

Qty: 3k/Reel

CONTACT INFORMATION

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 WAYON website: <http://www.way-on.com>
 For additional information, please contact your local Sales Representative.

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Specifications are subject to change without notice.
 The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.
 Users should verify actual device performance in their specific applications.

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[>>WAY-ON\(维安\)](#)