

Small Signal Chip Switching Diode

FEATURE:

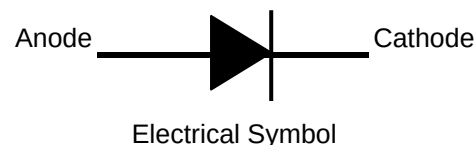
- This diode is also available in case styles uncluding the 0805 case with the designation. CD4148WSP and the 0603 case with the type disignation CD4148WTP.
- Silicon Epitaxial Planar Diode.
- Lead free and RoHS compliance components.
- Fast switvhing diode.



Cathode Band Color: white

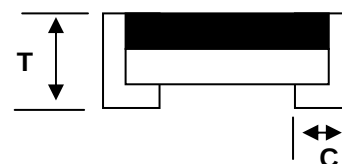
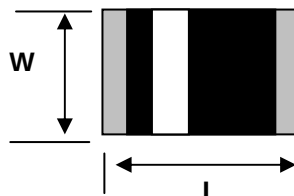
MECHANICAL CHARACTERISTICS:

- Size : 1206
- Weight: Approx 10mg.
- Marking: Cathode band.



DIMENSION:

Dimension (mm)	Type: 1206
L	3.2 ± 0.2
W	1.5 ± 0.2
T	0.85 ± 0.1
C	0.55 ± 0.2



THERMAL CHARACTERISTICS:

Parameter at Tamb = 25°C	Symbol	Value	Unit
Junction Temperature	T _j	175	°C
Thermal Resistance Junction to Ambient air	R _{θJA}	375 ¹	°C/W
Storage Temperature range	T _{stg}	-65 to 175 ¹	°C

1. Valid provided that electrodes are kept at ambient temperature.

ELECTRICAL CHARACTERISTICS

Parameter at Tamb = 25°C	Symbol	Value	Unit
Reverse Voltage:	V _R	75	V
Peak Recerse Voltage:	V _{RM}	100	V
Forward Continuos Current:	I _{FM}	300	mA
Average rectified current sin half wave rectification with resistive load f>50Hz	I _{F(AV)}	150 ¹	mA
Surge Forward Current at t<1s and and T _j =25°C	I _{FSM}	500	mA
Power Dissipation	P _{tot}	400 ¹	mW
Forward Voltage at I _F =100mA	V _F	1.0 max	V
Leakage Current at = V _R =20V	I _R	25 max	nA
Leakage Current at = V _R =75V	I _R	5 max	μA
Leakage Current at = V _R =20V, T _j =150°C	I _R	50 max	μA
Capacitance at V _F =V _R =0V	C _{tot}	4 max	pF
Voltage rise when switching ON, Testes with 50mA pulses, T _P =0.1us, risetime <20ns, F _p =(5-	V _{fr}	2.5 max	V
Reverse Recovery Time at I _F =100mA to I _R =1mA, V _R =V ₆ , R _L =100Ω	t _{rr}	4.0 max	ns
Rectification efficiency at f=100MHz, V _{RF} =2V	n _r	45 min	%

1. Valid provided that electrodes are kept at ambient temperature.

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TEST CHARACTERISTICS:

Test Item	Test Condition	Requirement
Solderability	Sn bath at $245\pm 5^{\circ}\text{C}$ for $2\pm 0.5\text{s}$	>95% area tin covered
Resistance to Soldering Heat	Sn bath at $260\pm 5^{\circ}\text{C}$ for $10\pm 0.5\text{s}$	V_F , V_Z , & I_R Within spec, no mechanical damage
Humidity Steady State	At 85°C 85%RH for 168hrs	V_F , V_Z , & I_R Within spec
Continue Forward Operating Life	At 25°C $I_F = 1.1 I_F$ for 1000hrs	V_F , V_Z , & I_R Within spec
Hi-Temperature Reverse Bias	At 150°C $V_R = 0.8V_R$ rated for 1000hrs	V_F , V_Z , & I_R Within spec
Thermal Shock	$-55\pm 5^{\circ}\text{C}/5\text{min}$ to $150\pm 5^{\circ}\text{C}/5\text{min}$ for 10cycles	V_F , V_Z , & I_R Within spec
Bending Strength	Bending up to 2mm for 1 cycle	V_F , V_Z , & I_R Within spec, no mechanical damage

APPLICATIONS:

- Function: Fast Switching.
- Soldering Condition:

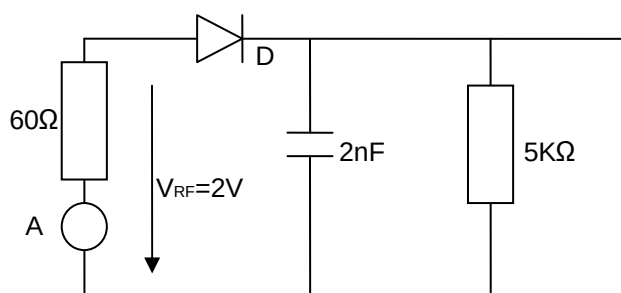
Soldering Condition & Caution:

- Recommended Soldering Condition (Refer to IPC/JEDEC J-STD-020D 5-1)

Recommended Profile Condition	Sn-Pb Soldering	Leadfree Soldering	Wave Soldering
Ramp-up rate (from pre-heat stage)	$<3^{\circ}\text{C}/\text{s}$	$<3^{\circ}\text{C}/\text{s}$	$\Delta T < 150^{\circ}\text{C}$
Pre-heat Temperature & Time	$100\sim 150^{\circ}\text{C}$, 60~120s	$100\sim 200^{\circ}\text{C}$, 60~120s	$100\sim 150^{\circ}\text{C}$, 60~120s
Soldering Temperature & Time	183°C , 60~150s	270°C , 60~150s	$260\pm 5^{\circ}\text{C}$, 5~2s
Peak Temperature	$230\pm 5^{\circ}\text{C}$, $<260^{\circ}\text{C}$	$245\pm 5^{\circ}\text{C}$, $<260^{\circ}\text{C}$	$260\pm 5^{\circ}\text{C}$
Time within 5°C of peak temperature	10~20s	20~30s	-
Ramp-down rate	$<6^{\circ}\text{C}/\text{s}$	$<6^{\circ}\text{C}/\text{s}$	$<6^{\circ}\text{C}/\text{s}$
Time 25°C to peak temperature	$<6\text{min}$	$<8\text{min}$	-

Manual Soldering: Approx. 350°C for 3s, avoid solder iron tip direct touch the components body.

RECTIFICATION EFFICIENCY MEASUREMENT CIRCUIT:



DEVICE OUTLOOK:

Plant front side



Plant back side



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TYPICAL CHARACTERISTICS (T_{amb}=25°C unless otherwise specified)

Figure 1. Forward Characteristics

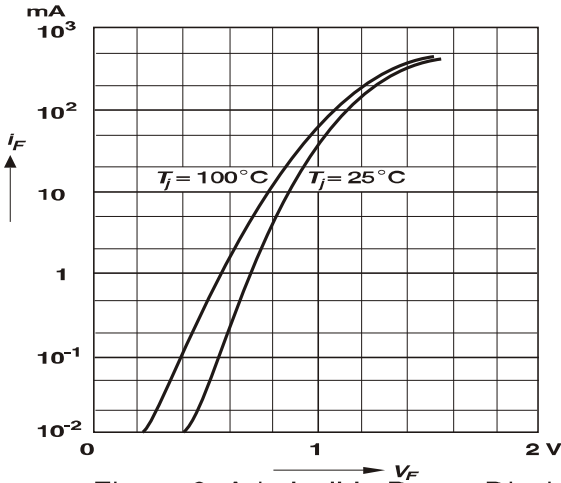


Figure 2. Dynamic Forward Resistance vs. Forward Current

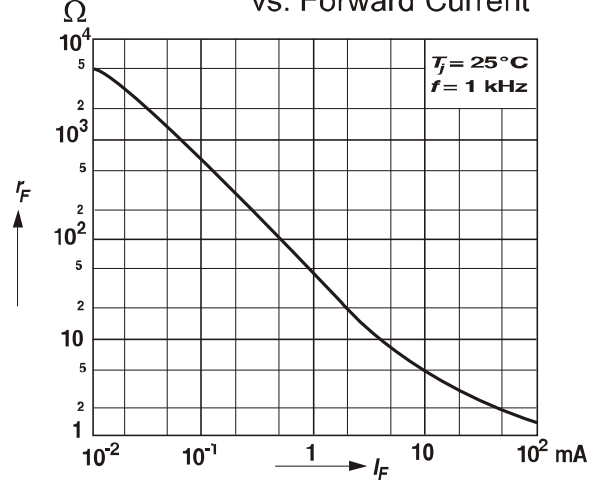


Figure 3. Admissible Power Dissipation vs. Ambient Temperature

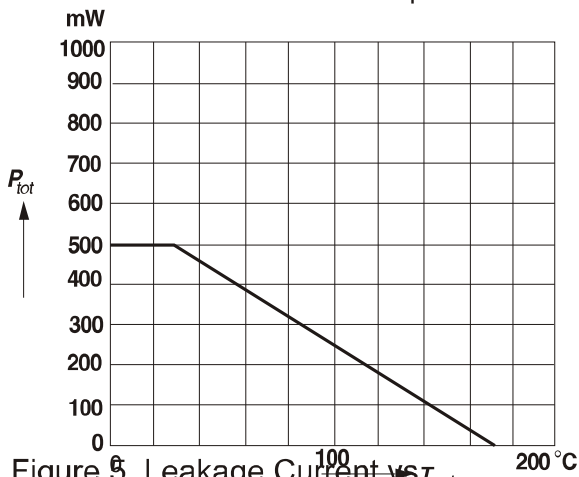


Figure 4. Relative Capacitance vs. Reverse Voltage

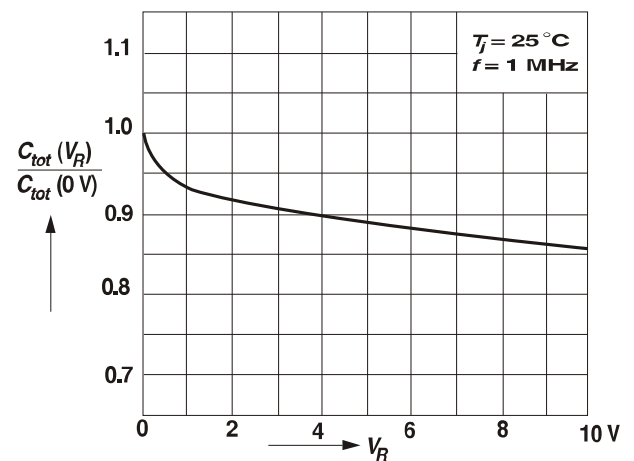


Figure 5. Leakage Current vs. Junction Temperature

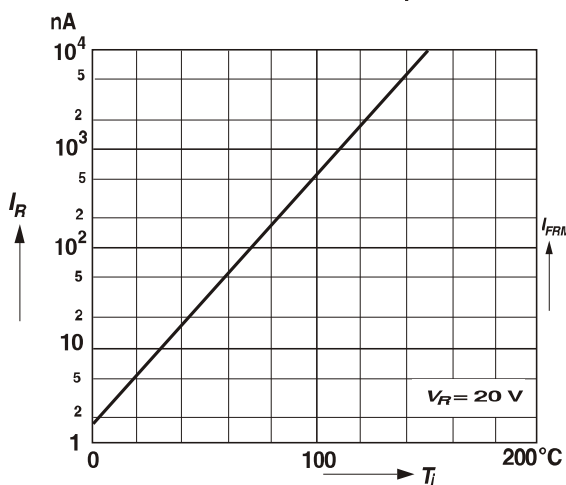
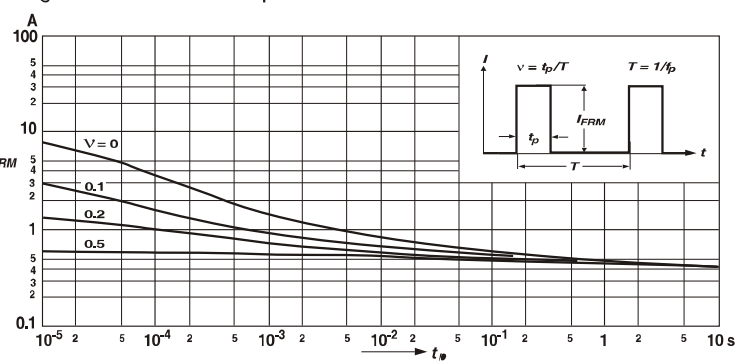


Figure 6. Admissible Repetitive Peak Forward Current vs. Pulse Duration



- 1). The recommended profiles are referring to IPC/JEDEC J-STD-020D & IEC-60068-2-58
- 2). Chip diode are able to stand maximum soldering temperature up to 260°C max for 10s, and the soldering cycles with max 3 times, referring to IEC-60068-2-58.

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RECOMMENDED SOLDERING PROFILE:

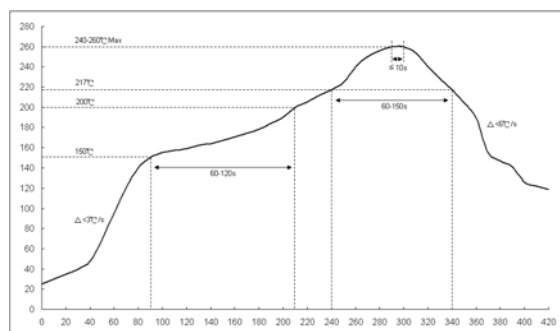


Fig 1: Reflow soldering profile for lead-free solder (SnAgCu)

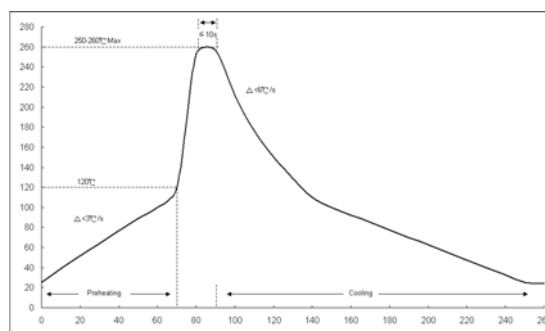
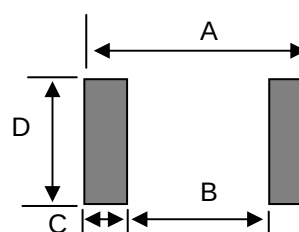


Fig 1: Wave soldering profile.

■ RECOMMENDED SOLDERING FOOTPRINT

Reflow/Wave Soldering:

Size:	Dimension (mm)			
	A	B	C	D
0603	1.8~2.6	0.8	0.5~0.9	0.8~1.0
0805	2.2~3.0	1.2	0.5~0.9	1.2~1.4
1206	3.4~4.2	2.1~2.2	0.6~1.0	1.5~1.7



- Storage Condition: Product termination solderability can degrade due high temperature and humidity or chemical environment, Storage condition must be in an ambient temperature of <40°C and ambient humidity of <75%RH, and free from chemical.

■ ENVIRONMENTAL CHARACTERISTICS

Product	Hazardous Substance or Element / ppm					
	Pd	Cd	Hg	Cr ⁶⁺	PBB	PBDE
CD4148WTP	<1000	<100	<1000	<1000	<1000	<1000
CD4148WSP	<1000	<100	<1000	<1000	<1000	<1000
CD4148WP	<1000	<100	<1000	<1000	<1000	<1000
Product	Halogen Substance / ppm					
	F	Cl	Br	I	-	Total
	<900	<900	<900	<900	-	<1500

■ PACKING METHOD:

Product	Quality / Reel	Reel Size	Tape	Approx Gross Weigh
CD4148WTP	5000	7"	Paper	10.5 Kgs/300K Ctn
CD4148WSP	5000	7"	Paper	10.5 Kgs/300K Ctn
CD4148WP	5000	7"	Paper	13.0 Kgs/300K Ctn

Carton:

Size: 39x39x20 cm
 Quality: 300K / Ctn.
 In Box: 6 Box
 Box Qty: 50K/Box
 Reel: 5K/Reel

