



**Simplifying System Integration™**

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# **73M1922 Demo Board User Manual**

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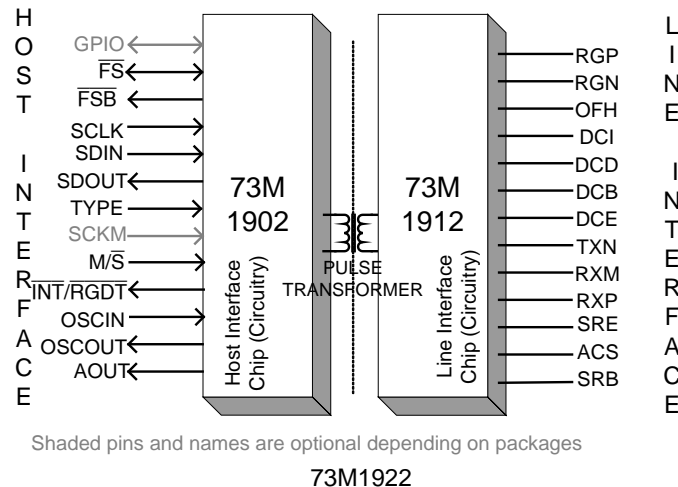
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## 1 Introduction

The 73M1922 MicroDAA Chipset Demo Board integrates silicon Data Access Arrangement (DAA) function along with Analog Front End functions chipsets for worldwide compliance.

The 73M1922 MicroDAA chipset consists of a 73M1902 and a 73M1912. The 73M1902 is the Host Interface Chip (HIC) providing a host microprocessor or DSP interface by a synchronous serial port (Modem Analog Front End (MAFE)) and the 73M1912 is the Line Interface Chip (LIC) to connect to a telephone line.

The 73M1922 chipset is packaged in two 20-pin TSSOP or two 32-pin QFN packages for a very small physical dimension and offers low cost global DAA design.



**Figure 1: MicroDAA System Block Diagram**

The 73M1922 performs a modem codec function that interfaces a Host/DSP and the PSTN (Public Switched Telephone Network). The codec supports data rates up to V.92 with call progress signaling. In addition to the codec function, the 73M1922 MicroDAA chipset also performs other necessary DAA functions, such as CID (caller identification), ring detection, tip/ring polarity reversal detection, on/off hook switch control, pulse dialing, regulation of loop current (DC-IV), line impedance matching, line in use and parallel pickup detection.

All data and control information between the LIC and the HIC is transferred across a low cost pulse transformer barrier. Also all clock and synchronization information needed in LIC is embedded in this data and control bit stream across the barrier transformer received from HIC and reconstructed within LIC. The LIC interface to tip/ring of the PSTN significantly lowers the number of external components and their cost.

The DAA feature integrated in this chipset offers a configurable US, ETSI ES 203 021-2, or other World Wide DAA capability to the telephone line interface and an auxiliary DAC with gain control for line monitoring during the call progress period.

## 1.1 Package Contents

The 73M1922 Demo Board Kit includes:

- A 73M1922 Demo Board (Rev. D1)
- The following documents on CD:
  - *73M1922 Demo Board User Manual* (this document)
  - *73M1822/73M1922 Data Sheet*
  - *73M1822/73M1922 Layout Guideline*
  - *73M1x22 Worldwide Design Guide*

## 1.2 Safety and ESD Notes

Connecting live voltages to the Demo Board system will result in potentially hazardous voltages on the boards.



**Extreme caution should be taken when handling the Demo Boards after connection to live voltages!**



**The Demo Boards are ESD sensitive! ESD precautions should be taken when handling these boards!**

## 1.3 Demo Board Options

The 73M1922 Demo Board has 20-pin right angle connectors to plug on to a target DSP or CPU system. Each has a 3.3 V power receptacle for powering on-board circuits from target system or external power supply, or power can be supplied through the 20-pin connector along with the other signals. The 73M1922 Demo Board allows the evaluation of the 73M1922 chipset for universal modem, voice application and interface to a general DSP or CPU system use.

## 2 Connectors

Table 1 shows all the connectors and jumpers available on 73M1922 MicroDAA Demo Board. JS1 is the main connector for interfacing to a host processor or DSP board. Line monitor/Call progress monitor speaker and driver circuits are also on board. J1 is a modular connector for phone line connection and J4 is for power connection from the main board or an external power supply.

**Table 1: 73M1922 Demo Board Connectors**

Schematic and PCB Reference	Name	Description
JS1	3M CONN. 10X2	20-pin connector to interface 73M1922 Demo Board to a HOST controller main board.
J1	RJ-11	Telephone line connector.
J2	3.3 V supply	Plug for connecting external 3.3 V DC power supply.

**Table 2: 73M1922 Demo Board Configuration Settings**

Schematic and PCB Reference	Name	Description
R54 (20 TSSOP DB),	TYPE	Frame Sync Type: 0 $\Omega$ population: Late FSB (Default for Samsung ARM9 Interface). None: Early FSB.
R64 (32 QFN DB only)	MODE	SCLK mode: 0 $\Omega$ population: 32 Clock. None: Continuous SCLK. (Default for Samsung ARM9 Interface)

\* NOTE: Due to the package restrictions, the MODE pin is not available in a 20-pin TSSOP package. And neither the Mode pin nor the TYPE pin is available in 42-pin QFN package. User should choose the right device option when ordering parts depending on the clock mode (32 clock or continuous) and Frame sync type (early or late frame sync) required. Refer to the ordering information section of the *73M1822/73M1922 Data Sheet*.

**Table 3: JS1 Host Interface Connector**

PIN Number	Name	Description	PIN Number	Name	Description
1	NC		11	RINGD	Ring Det.out
2	VCC	3.3V power supply	12	NC	
3	NC		13	NC	
4	RESET	Reset Input	14	NC	
5	NC		15	AFEIN	Serial Data In
6	NC		16	AFEOUT	Serial Data Out
7	NC		17	SCLK	Serial Clock
8	NC		18	FS	Frame Sync
9	RINGD	Ring Det.out	19	NC	
10	NC		20	GND	Ground

### 3 Demo Board Schematics, PCB Layouts and Bill of Materials

#### 3.1 Schematic

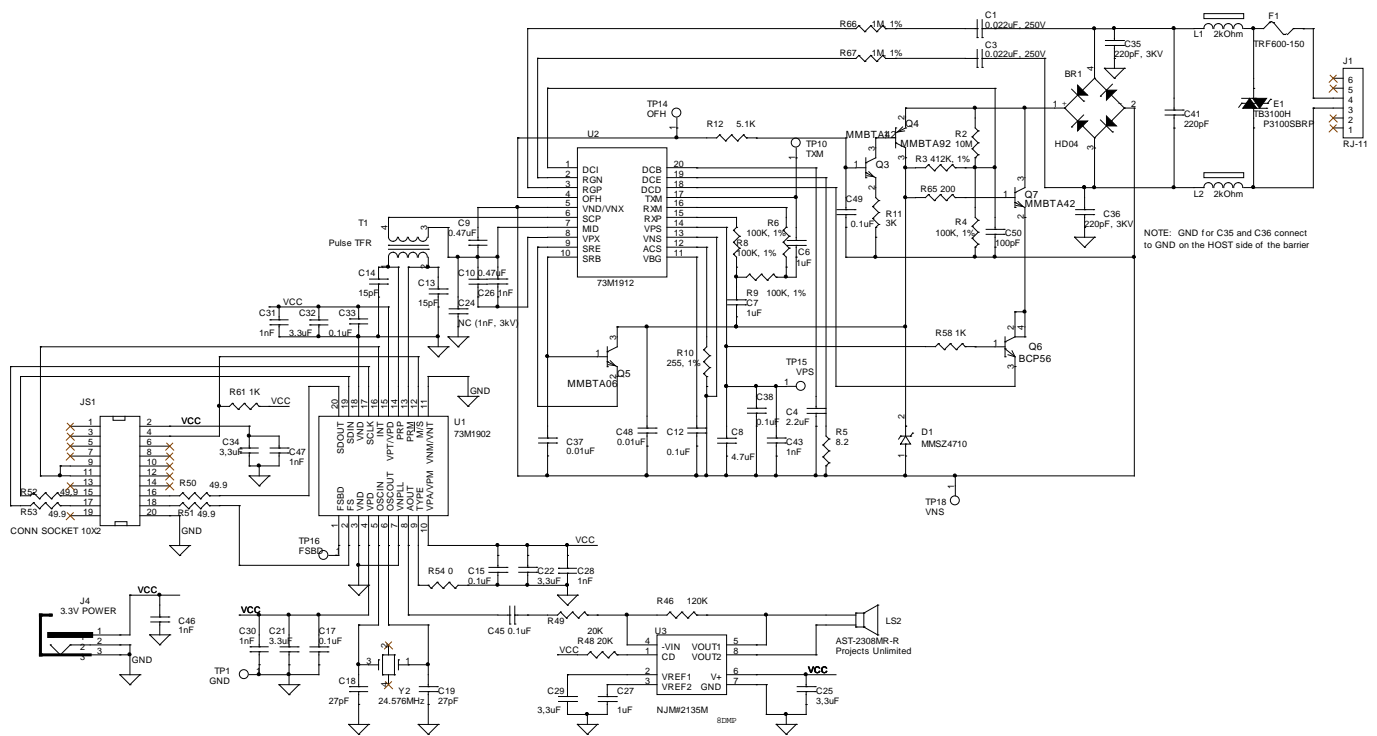


Figure 2: 73M1922 MicroDAA 20-Pin TSSOP Demo Board Schematic Diagram



### 3.2 73M1922 20-Pin TSSOP Demo Board Layout

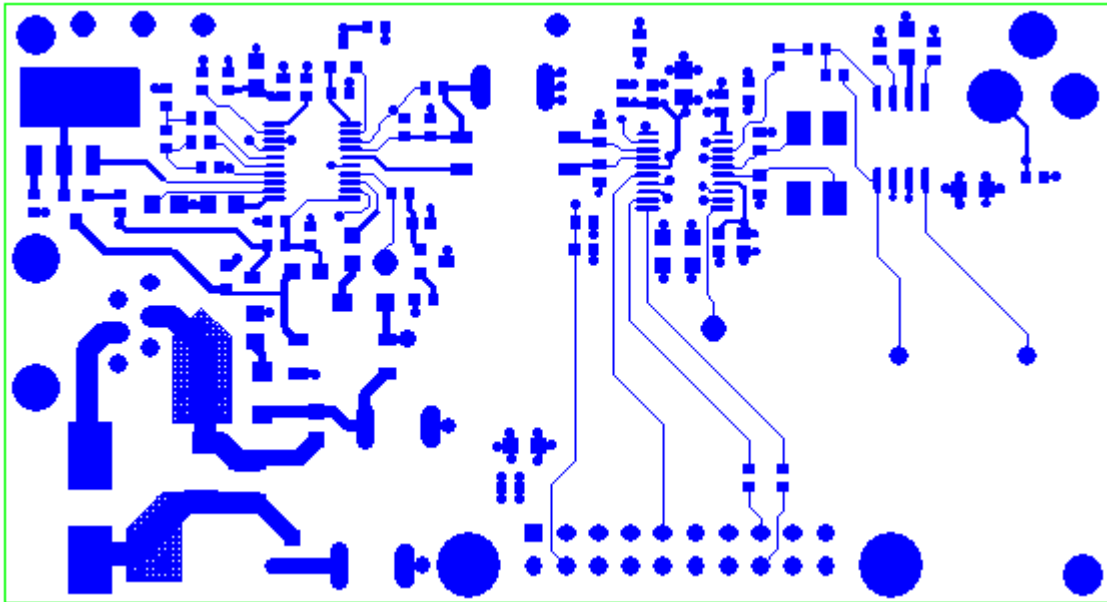


Figure 3: 73M1922 20-Pin TSSOP Demo Board: Top Signal Layer

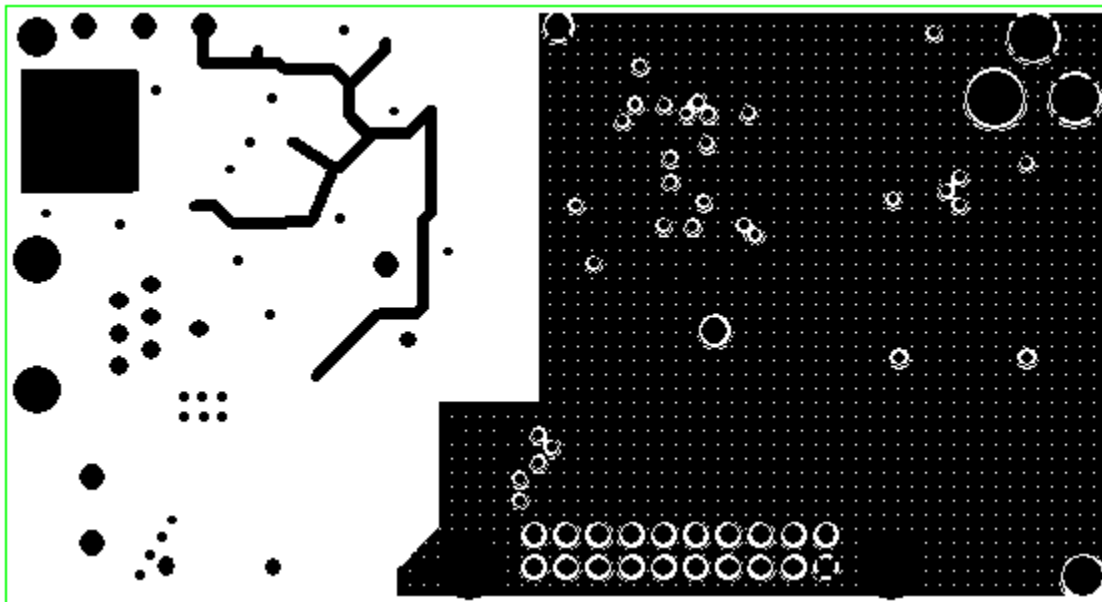


Figure 4: 73M1922 20-Pin TSSOP Demo Board: Layer 2, Ground Plane

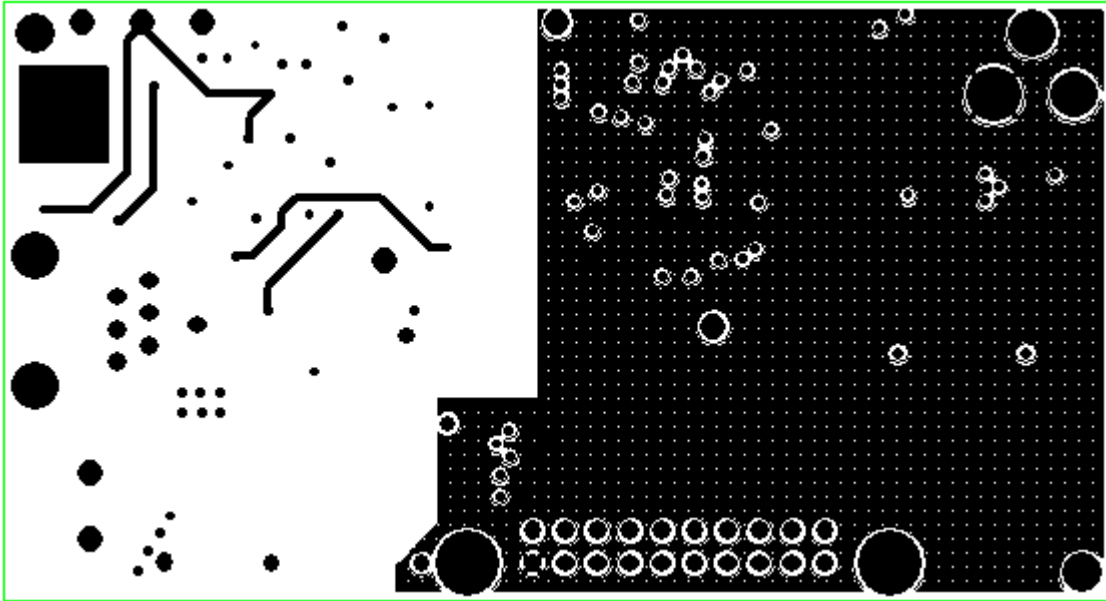


Figure 5: 73M1922 20-Pin TSSOP Demo Board: Layer 3, Supply Plane

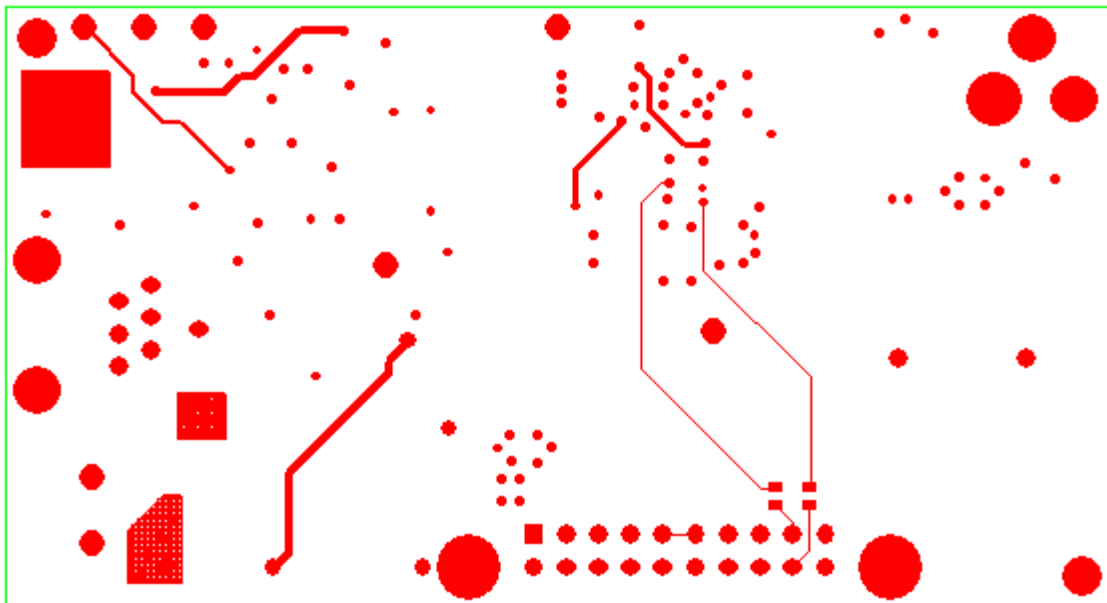


Figure 6: 73M1922 20-Pin TSSOP Demo Board: Bottom Signal Layer

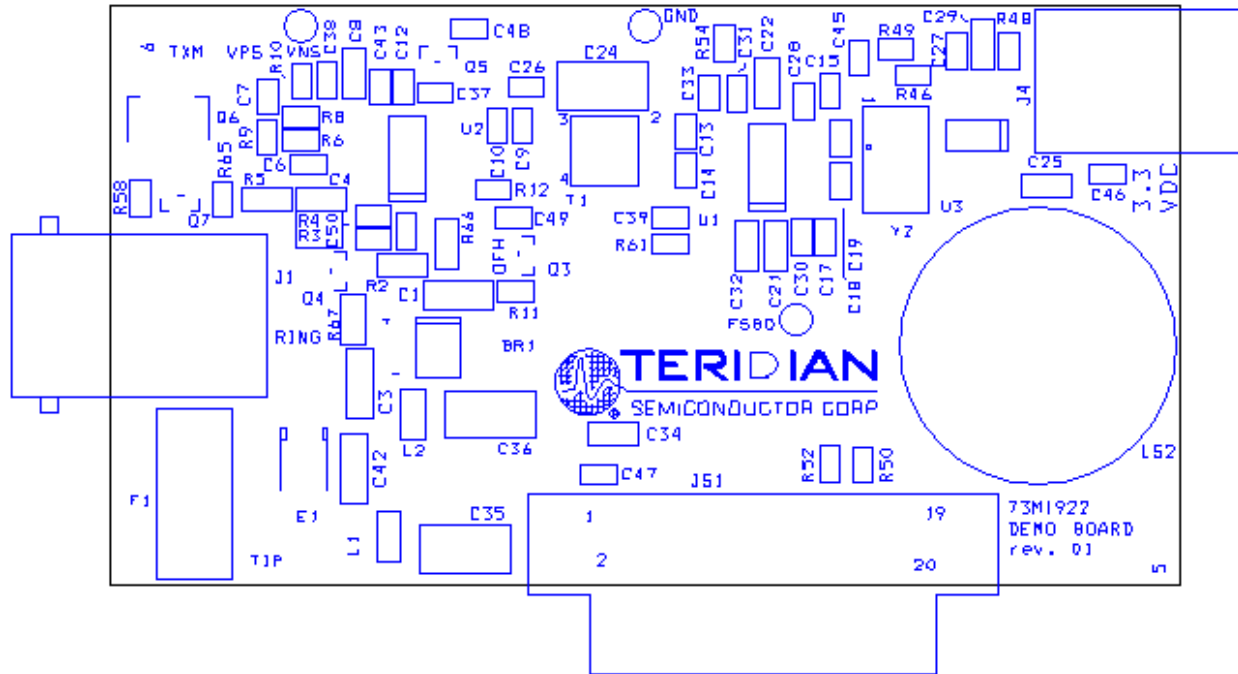


Figure 7: 73M1922 20-Pin TSSOP Demo Board: Silk Screen Top

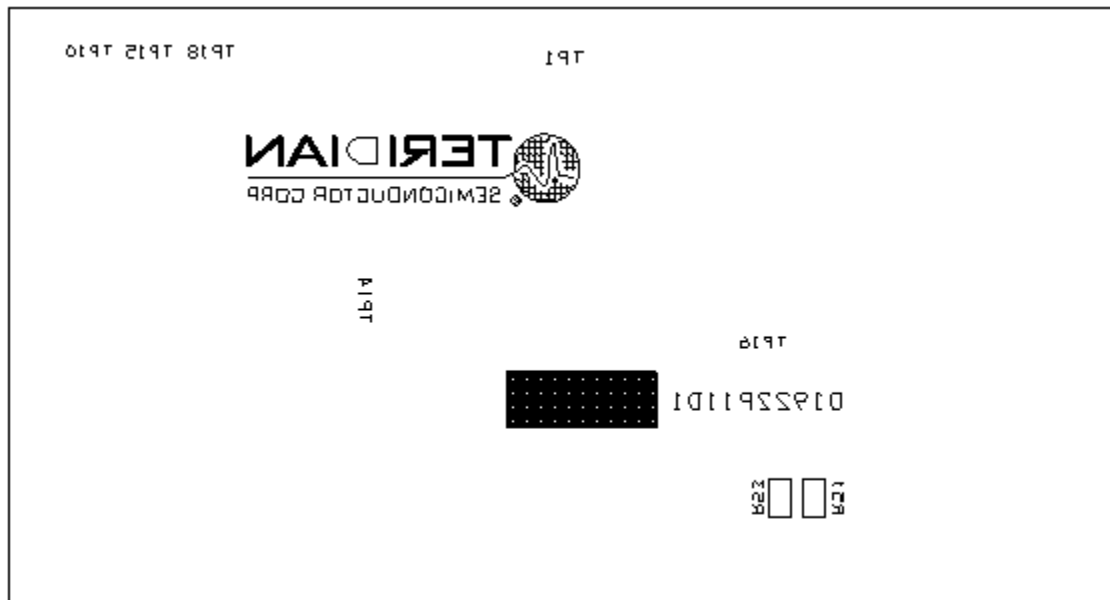


Figure 8: 73M1922 20-Pin TSSOP Demo Board: Silk Screen Bottom

### 3.3 Demo Board Physical Dimensions

#### PCB Dimensions

- Size

73M1922DB	3.16 x 2.05" (80.20 x 52.50 mm)
Height w/ components and solder	
73M1922DB	0.65" (16.5 mm)

#### Environmental

- Operating Temperature  
(function of crystal oscillator affected outside) °-40 to +85°C  
-10°C to +60°C
- Storage Temperature -65 to 150°C

#### Power Supply

- DC Input Voltage (powered from DC supply) 3.3 VDC  $\pm$ 10%
- Supply Current 25 mA (off-hooked at room temperature) typical

### 3.4 Bill of Materials

Table 4: 73M1922 20-Pin TSSOP Demo Board Bill of Materials

Qty	Reference	Part	DigikeyPN	MFRPN	MFR
1	BR1	HD04	HD04DICT-ND	HD04-T	DIODES Inc.
2	C1,C3	0.022uF, 250V	399-1242-1-ND	C1206C223K5RACTU	Kemet
1	C4	10uF	399-3522-1-ND	C0805C225K8RACTU	Kemet
2	C6,C7	1uF	587-1241-1-ND	EMK107BJ105KA-TR	Taiyo Yuden
1	C8	4.7uF	PCC2176CT-ND	ECJ-2FB0J475M	Panasonic
2	C10,C9	0.47uF	PCC1911CT-ND	ECJ-1VB0J474K	Panasonic
6	C12,15,17,33,38,49	0.1uF	399-1095-1-ND	C0603C104K8RACTU	Kemet
2	C14,C13	15pF	445-1271-1-ND	C1608COG1H150J	TDK
2	C19,C18	27pF	PCC270ACVCT-ND	ECJ-1VC1H270J	Panasonic
4	C21,C22,C32,C34	3.3uF	PCC1925CT-ND	ECJ-2YB0J335K	Panasonic
2	C35,C36	220pF, 3KV	445-2380-1-ND	C4532COG3F221K	TDK
8	C26,28,30,31,39,43,46,47	1nF	PCC1772CT-ND	ECJ-1VB1H102K	Panasonic
2	C37,C48	0.01uF	478-1227-1-ND	06035C103KAT2A	AVX
1	C50	100pF	311-1069-1-ND	CC0603JRNPO9BN101	Yageo
1	C51	220pF, 630V	445-2338-1-ND	C3216COG2J221J	TDK
1	E1	TB3100H	TB3100H-FDICT	TB3100H-13-H	DIODES
1	F1	TRF600-150	576-04611.25ER	04611.25ER	Littlefuse
1	JS1	CONN 10X2	517-8520-4500	8520-4500JL	3M
1	J1	RJ-11	A31420-ND	5555163-1	AMP/Tyco
1	J4	POWER CONN	SC237-ND	RAPC712X	Switchcraft Inc.
2	L1,L2	2kOhm @ 100MHz, 200mA	240-2396-1-ND	HZ0805C202R-10	Steward
2	Q3,Q7	MMBTA42	863-MMBTA42LT1G	MMBTA42LT1G	ON Semi.
1	Q4	MMBTA92	863-MMBTA92LT1G	MMBTA92LT1G	ON Semi.
1	Q5	MMBTA06	863-MMBTA06LT1G	MMBTA06LT1G	ON Semi.
1	Q6	BCP56	568-1639-1-ND	BCP56	Philips
1	R2	10M	541-10.0MCCT-ND	CRCW080510M0FKEA	Vishay
1	R3	412K, 1%	P412KHTR-ND	ERJ-3EKF4123V	Panasonic
4	R4,R6,R8,R9	100K, 1%	P100KHCT-ND	ERJ-3EKF1003V	Panasonic
1	R5	8.2	541-8.20CCT-ND	CRCW08058R20FNEA	Vishay
1	R10	255, 1%	311-255HRCT-ND	RC0603FR-07255RL	Yageo
1	R11	3K	311-3.00KHRCT-ND	RC0603FR-073K0L	Yageo
1	R12	5.1K	311-5.10KHRCT-ND	RC0603FR-075K1L	Yageo
4	R50,R51,R52,R53	49.9	P49.9HCT-ND	ERJ-3EKF49R9V	Panasonic
1	R54	0	P0.0GCT-ND	ERJ-3GEY0R00V	Panasonic
2	R58,R61	1K	P1.00KHCT-ND	ERJ-3EKF1001V	Panasonic
1	R65	200	P200HCT-ND	ERJ-3EKF2000V	Panasonic
2	R67,R66	1M, 1%	311-1.00MCRCT-ND	RC0805FR-071ML	Yageo
2	TP1,10, 14, 15,16,18	Test Points	5002K-ND	5002	Keystone
1	T1	Pulse TFR		ESMIT-4180/750110001	Sumida/Midcom
1	U1	73M1902		73M1902	Teridian
1	U2	73M1912		73M1912	Teridian
1	Y2	24.576MHz	815-ABMM2-24.576-E2T	ABMM2-24.576MHZ-E2-T	ABRACON

### 3.5 Pin Descriptions

Table 5 shows the 73M1902 20-pin TSSOP package pin names and Table 6 shows the 73M1912 20-pin TSSOP package pin definitions.

**Table 5: 73M1902 HIC 20-Pin TSSOP Package Pin Definitions**

Pin	Name	Pin	Name
1	FSD	11	VNM/VNT
2	FS	12	M/S
3	VND	13	PRM
4	VPD/VPPLL	14	PRP
5	OSCIN	15	VPT/VPD
6	OSOUT	16	INT/RGDT
7	VNPLL/VNA	17	SCLK
8	AOUT	18	VND
9	TYPE	19	SDIN
10	VPA/VPM	20	SDOUT

**Table 6: 73M1912 LIC 20-Pin TSSOP Package Pin Definitions**

Pin	Name	Pin	Name
1	DCI	11	VBG
2	RGN	12	ACS
3	RGP	13	VNS
4	OFH	14	VPS
5	VNX/VNS	15	RXP
6	SCP	16	RXM
7	MID/LEV	17	TXM
8	VPX	18	DCD
9	SRE	19	DCE
10	SRB	20	DCB

### 3.5.1 731922 MicroDAA Pinout

Figure 9 shows the pinout top views of the 73M1902/73M1912 TSSOP packages.

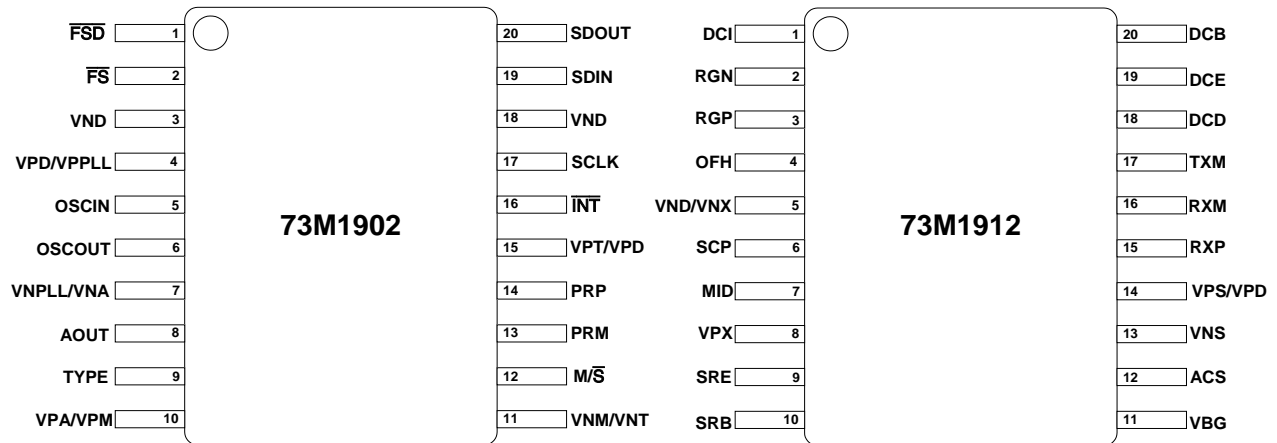


Figure 9: 73M1902/73M1912 20-Pin TSSOP Packages: Pinout (top view)

## 4 Related Documentation

The following 73M1x22 documents are available from Teridian Semiconductor Corporation:

*73M1822/73M1922 Data Sheet*

*73M1922 Demo Board User Manual (this document)*

*73M1822/73M1922 Layout Guideline*

*73M1x22 Worldwide Design Guide*

*73M1822/73M1922 Evaluation System with Linux Softmodem User's Guide*

*73M1x22/73M1x66B MicroDAA DC Control Loop Operation*

*73M1x22/73M1x66 MicroDAA Hybrid Operation*

## 5 Contact Information

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