



 **Mini-Circuits<sup>®</sup>**  
**NEW**  
**PRODUCT**  
GUIDE

## *Hundreds of New Products. Infinite Possibilities.*

Mini-Circuits has introduced hundreds of new products, growing some product lines by as much as 50% in 2020 alone! With our latest in-house designs from LTCCs and MMICs to connectorized amplifiers, test solutions and more, we continue to expand our portfolio for continuing development in the mmWave bands and solidify our position as the world's preferred supplier for the next generation of wireless applications.

Our Q3 new product guide gives you a snapshot of some of our latest catalog introductions just from the last few months. We hope you find this information helpful as you consider part selection for your next design. Remember, if you don't see what you need here, we offer THOUSANDS of models off the shelf and custom design capability with fast turnaround. Our applications engineers are ready to support your product selection efforts or discuss your special requirements for custom designs.

## *The World's Preferred Supplier of RF, Microwave and mmWave Products.*

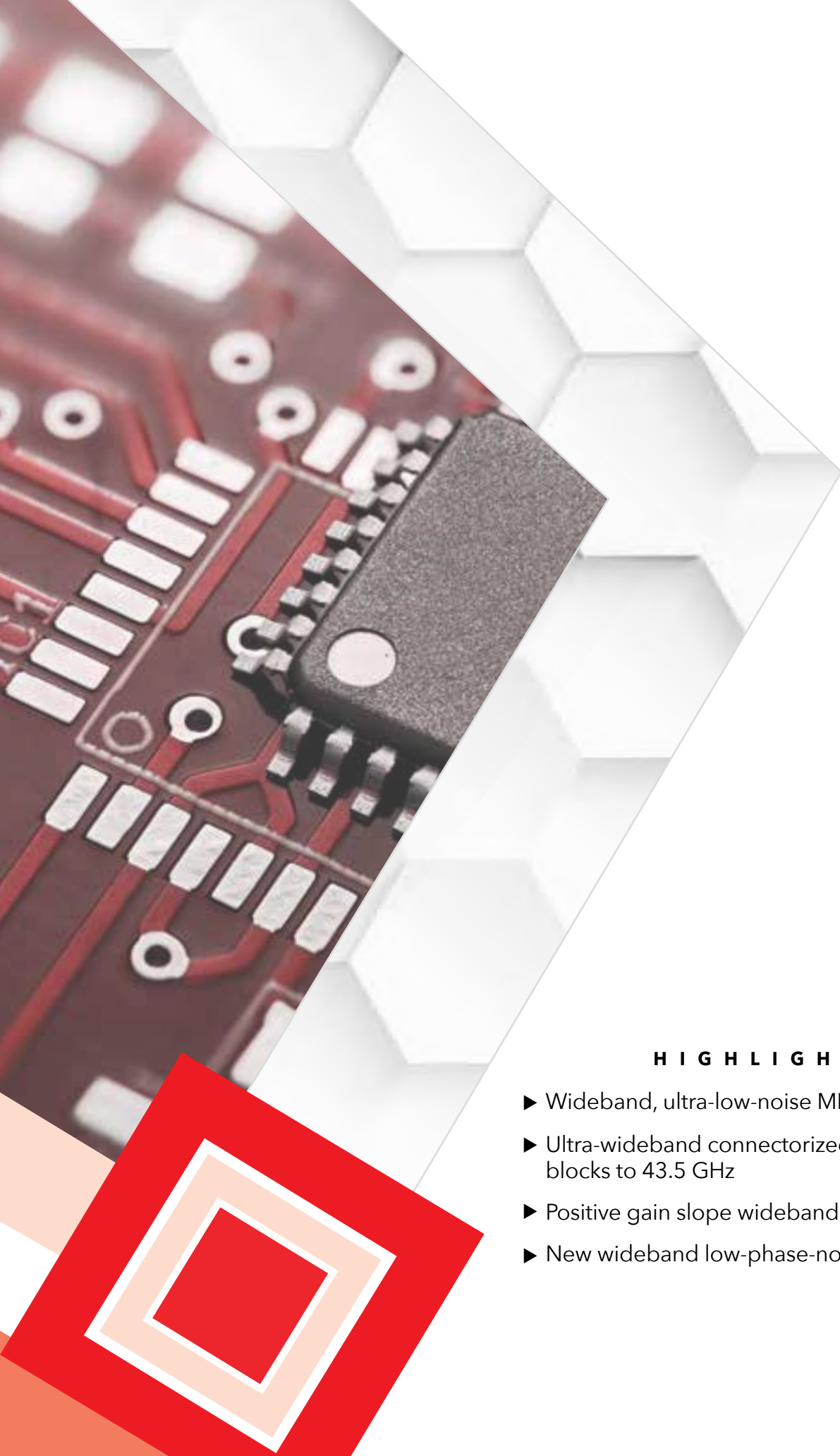
- ◆ *Over 50 years of in-house design and manufacturing expertise*
- ◆ *Over 7,500 catalog components*
- ◆ *Custom turnaround as fast as 7 weeks*
- ◆ *EOL guarantee - support through the life of your system*
- ◆ *Accessible, engineer-to-engineer application support*
- ◆ *Global sales and distribution presence*
- ◆ *Award-winning quality and customer service*
- ◆ *Easy RMA process*

## *Always Here to Support You*

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# AMPLIFIERS

- H I G H L I G H T S**
- ▶ Wideband, ultra-low-noise MMIC transistors
  - ▶ Ultra-wideband connectorized gain blocks to 43.5 GHz
  - ▶ Positive gain slope wideband MMIC amplifiers
  - ▶ New wideband low-phase-noise gain block

AM

## AMPLIFIERS

50Ω 10 to 10000 MHz

### Low Noise MMIC Transistors

- Wide bandwidth
- Low noise figure
- High IP3



NEW RELEASES	Frequency Range (MHz)	Gain (dB)	NF (dB)	P1dB (dBm)	OIP3 (dBm)	Voltage (V)	DC Current (mA)
SAV-541+	45-6000	23.2	0.5	19.2	33.1	3	60
SAV-541-D+	450-6000	19.1	0.38	21	33.1	3/4	15/30/60
SAV-551+	45-6000	20.9	0.5	17.5	24.3	3	15
SAV-581+	45-6000	22.3	0.5	19	30.6	3	30
SAV-331+	10-4000	24.1	0.5	19.6	32.3	4	60
TAV2-14LN+	50-10000	16.4	0.7	18.8	30.9	2/4	20/40
TAV2-14LN-D+	50-10000	16.4	0.7	18.8	30.9	2/4	20/40
TAV-541+	45-6000	23.8	0.5	19.1	33.6	3	60
TAV-551+	45-6000	21.3	0.5	17.5	23.5	3	15
TAV-581+	45-6000	22.9	0.5	18.3	30.3	3	30
TAV1-541+	45-6000	23.2	0.5	19.2	33.1	3	60
TAV1-331+	10-4000	24.1	0.6	20.1	31.8	4	60

50Ω 500 to 18000 MHz

### Wideband Monolithic Amplifier Die

- Super Wideband
- Excellent Gain Flatness
- Good Directivity



Model Number	Frequency Range (MHz)	Gain (dB)	NF (dB)	P1dB (dBm)	OIP3 (dBm)	Input VSWR (:1)	Output VSWR (:1)	Voltage (V)	DC Current (mA)
HK-A183-D+	500-18000	13.3	3.3	18.6	27.4	1.33	1.119	5	85

50Ω 50 to 8000 MHz

## Wideband Ultra-Linear MMIC Amplifiers

- Ultra-wide bandwidth
- Ultra-high IP3
- Excellent gain flatness



NEW RELEASE	Frequency Range (MHz)	Gain (dB)	NF (dB)	P1dB (dBm)	OIP3 (dBm)	Input VSWR (:1)	Output VSWR (:1)	Voltage (V)	DC Current (mA)
LHA-1+	50-6000	14.1	2.1	22.7	40	1.7	1.4	5	146
PHA-1+	50-6000	13.5	2.2	22.4	42	1.7	1.3	5	146
LHA-83W+	50-8000	16.8	3.1	23.3	35.1	1.14	1.21	5/9	40/105
PHA-83W+	50-8000	15.7	3.3	23.3	35.5	1.57	1.28	5.0/9.0	41/110

50Ω 500 to 18000 MHz

## Positive Gain Slope MMIC Amplifiers

- Ultra-wideband
- Positive gain slope
- Single positive supply voltage



NEW RELEASE	Frequency Range (MHz)	Gain (dB)	NF (dB)	P1dB (dBm)	OIP3 (dBm)	Input VSWR (:1)	Output VSWR (:1)	Voltage (V)	DC Current (mA)
AVA-183P+	500-18000	8.1	4.8	11.7	21.5	1.67	1.92	5	46
AVA-183P-D+	500-18000	8.1	4.8	11.7	21.5	1.67	1.92	5	46

50Ω .0025 to 700 MHz

## Coaxial Pulse Amplifier

- Wideband
- High Gain
- Handles wide pulse width with excellent rise/fall time



NEW RELEASE	Frequency Range (MHz)	Gain (dB)	NF (dB)	P1dB (dBm)	OIP3 (dBm)	Input VSWR (:1)	Output VSWR (:1)	Voltage (V)	DC Current (mA)
ZHL-72A+	0.0025-700	35	7.7	24	34	2	2	24	350
ZHL-5W-63X-S+	6000-600	42	12	37	42	2.5	3.5	28	3500

50Ω 1000 to 22000 MHz

## Coaxial Wideband Gain Block

- Ultra-wideband
- Medium power
- Voltage regulated internally and reverse voltage protected



Model Number	Frequency Range (MHz)	Gain (dB)	NF (dB)	P1dB (dBm)	OIP3 (dBm)	Input VSWR (:1)	Output VSWR (:1)	Voltage (V)	DC Current (mA)
ZVA-24443G1+	24000-43500	45	1.7	20	27	2	2.5	15	160
ZVA-02443HP+	2000-43500	37	3.5	17	25	1.5	1.8	15	130
ZVA-443HGX+	10-43500	33	3.5	9	18	1.5	2.5	15	225
ZVA-443X+	0.05-43500	11	4.5	10	22	1.8	1.9	5	80
ZVA-403GX+	0.05-40000	11	4.5	11	21	1.45	1.6	5	100
ZVA-01243+	1000-22000	12.8	5	21.6	27.5	1.7	1.4	8	170
ZVA-203GX+	1500-21000	29	3	15.5	27.5	1.5	1.6	5	450
ZVA-213-S+	800-21000	26	3	24	33	1.35	1.25	12	400
ZVA-213X-S+	800-21000	26	3	24	33	1.35	1.25	12	400
ZVA-213UWX+	100-20000	14	3	16	29	1.3	1.4	+12, -5	84
ZVA-183-S+	700-18000	26	3	24	33	1.35	1.25	12	400
ZVA-183X-S+	700-18000	26	3	24	33	1.35	1.25	12	400
ZVA-183GX-S+	500-18000	38	3	25	36	1.9	2	15	770
ZVA-183G-S+	500-18000	38	3	25	36	1.9	2	15	770
ZVA-183W-S+	100-18000	28	3	26	34.5	1.3	1.6	15	625
ZVA-183WX-S+	100-18000	28	3	26	34.5	1.3	1.6	15	625

50Ω 2000 to 20000 MHz

## Wideband Low-Phase-Noise Amplifier

- Low additive phase noise, -164 dBc/Hz @ 10 KHz offset
- Excellent directivity
- High gain and excellent flatness
- Voltage regulated internally and reverse voltage protection



NEW RELEASE	Frequency Range (MHz)	Gain (dB)	NF (dB)	P1dB (dBm)	OIP3 (dBm)	Input VSWR (:1)	Output VSWR (:1)	Voltage (V)	DC Current (mA)
ZX60-02203LPN+	2000-20000	16	5	17	31	1.92	1.67	5	79

# CABLES



## CABLES

50Ω DC to 67 GHz

### VNA Ultra-Wideband Flexible Cables

- 1.85mm rugged female connector for direct interface with 67 GHz VNA ports
- Low insertion loss and excellent return loss
- Rugged construction, crush and torque resistant



NEW RELEASES					
Model Number	Connector 1	Connector 2	Length (FT)	Frequency Range (GHz)	Insertion Loss (dB)
VNAX-1M-EMERF+	1.85 mm-Female	1.85 mm-Male	3.28	DC-67	5.79
VNAX-2FT-EMERF+	1.85 mm-Female	1.85 mm-Male	2.0	DC-67	3.7
VNAX-2FT-KMVRF+	2.4 mm-Female	2.92 mm-Male	2.0	DC-40	2.0
VNAX-2FT-VMVRF+	2.4 mm-Female	2.4 mm-Male	2.0	DC-50	2.4
VNAX-3FT-EMERF+	1.85 mm-Female	1.85 mm-Male	3.0	DC-67	5.36

75Ω DC to 3000 MHz

### Precision Test Cables

- Excellent return loss
- Performance qualified to 20,000 flexures
- Extra rugged construction with strain relief for longer life



NEW RELEASE					
Model Number	Connector 1	Connector 2	Length (FT)	Frequency Range (MHz)	Insertion Loss (dB)
CBL-1MFM-75+	F-Type-Male	F-Type-Male	3.28	3.0	0.89
CBL-2FM-75+	F-Type-Male	F-Type-Male	2.0	3.0	0.61
CBL-3FM-75+	F-Type-Male	F-Type-Male	3.0	3.0	0.77
CBL-3NM-75+	N-Type-Male	N-Type-Male	3.0	3.0	0.7
CBL-4NM-75+	N-Type-Male	N-Type-Male	4.0	3.0	0.8
CBL-6FM-75+	F-Type-Male	F-Type-Male	6.0	3.0	1.43
CBL-6NM-75+	N-Type-Male	N-Type-Male	6.0	3.0	1.43

### HIGHLIGHTS

- ▶ VNA flexible cables up to 67 GHz
- ▶ 75Ω Precision test cables performance qualified up to 20,000 flexures

# COUPLERS

## HIGHLIGHTS

- ▶ High-power surface mount couplers up to 50W
- ▶ New MMIC power tap die covers DC-50 GHz
- ▶ Tiny LTCC coupler, 0603
- ▶ New connectorized directional couplers to 65 GHz

50Ω 3 to 2000 MHz

### High Power Surface Mount Bi-Directional Couplers

- High power handling
- Small size
- Low mainline loss
- High directivity
- Excellent VSWR

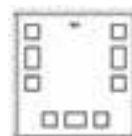


NEW RELEASE	Frequency Range (MHz)	Coupling Nom. (dB)	Mainline Loss (dB)	Directivity (dB)	VSWR (:1)	Power Input Max. (W)
<b>Model Number</b>						
SYBDC-10-13HP+	50-1000	10	0.95	20	1.23	10
SYBDC-15-13HP+	100-1000	15.8	0.75	20	1.15	10
SYBDC-6-62HP+	30-600	6.7	1.9	20	1.22	10
SYBDC-26-52VHP+	30-540	26	0.15	25	1.2	50
SYBDC-15-52VHP+	10-520	15	0.5	18	1.06	30

50Ω DC to 50 GHz

### MMIC Wideband Power Tap Die

- Ultra-wide bandwidth
- Excellent coupling flatness, 26.5 ±1.4 dB
- Excellent VSWR, 1.2:1



Model Number	Frequency Range (MHz)	Coupling (dB) Nom.	Mainline Loss (dB) Typ.	Directivity (dB) Typ.	VSWR (:1) Typ.	Power Input Max. (W)
HK-PT54-D+	DC-50000	26.5	0.8	-	1.27	1

50Ω 2400 to 7200 MHz

### LTCC Directional Coupler

- Excellent return loss for input/output ports ideal for signal-tap
- Ultra-small size, 0603 (1.6 x 0.8mm)
- Temperature stable



Model Number	Frequency Range (MHz)	Coupling (dB) Nom.	Mainline Loss (dB) Typ.	Directivity (dB) Typ.	VSWR (:1) Typ.	Power Input Max. (W)
DCW-11-722+	2400-7200	13	0.7	12	1.3	1

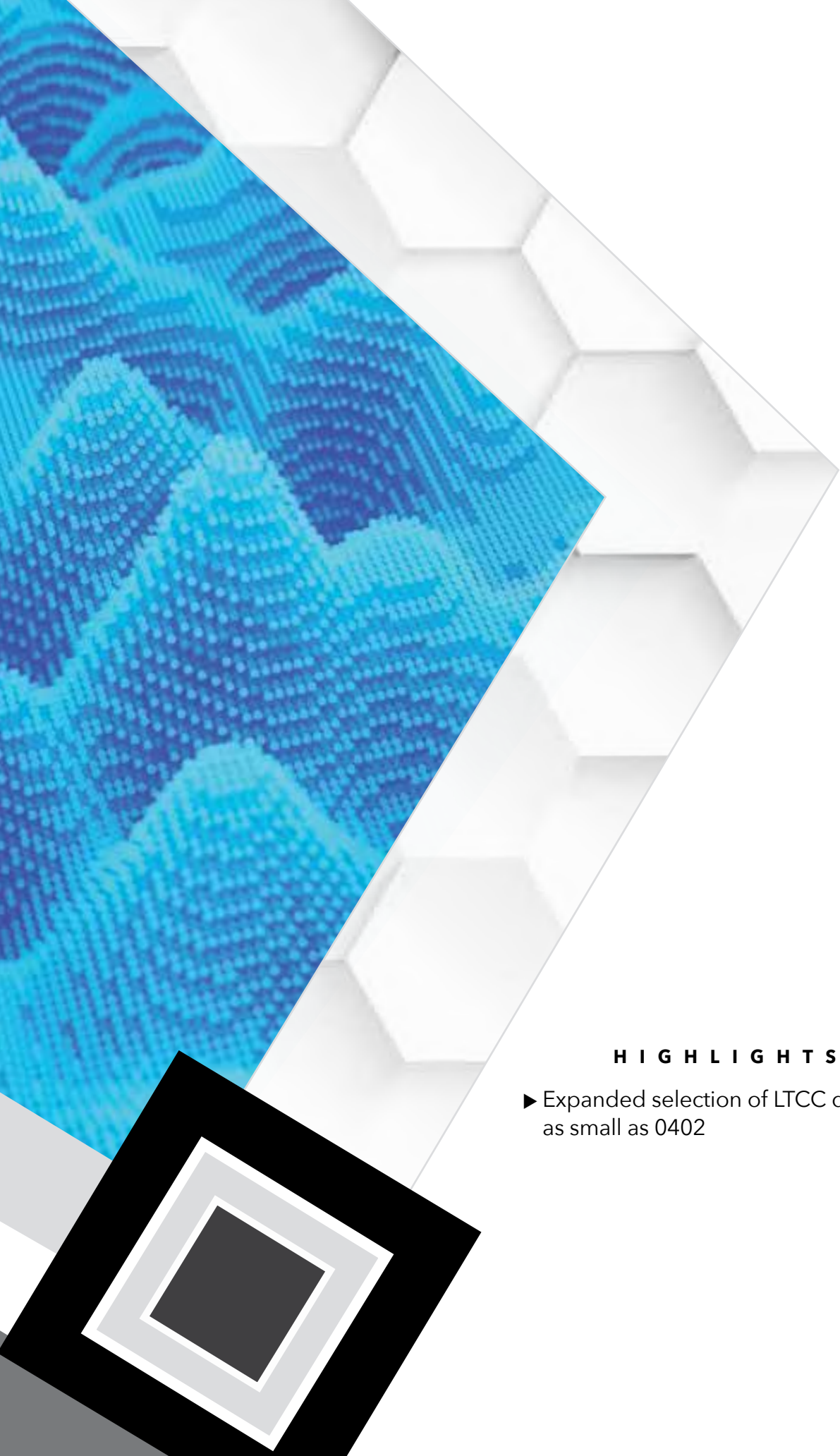
50Ω 500 to 65000 MHz

### Wideband Directional Couplers up to 65 GHz

- Ultra-wideband
- Excellent coupling flatness
- High power handling



NEW RELEASES	Frequency Range (MHz)	Coupling (dB) Nom.	Mainline Loss (dB) Typ.	Directivity (dB) Typ.	VSWR (:1) Typ.	Power Input Max. (W)
<b>Model Number</b>						
ZCDC10-E2653+	2000-65000	10	1.45	22	1.11	11
ZCDC10-E6653+	6000-65000	10	1.2	22	1.12	11
ZCDC13-E1653+	1000-65000	13	1.55	21.5	1.12	11
ZCDC20-E18653+	18000-65000	20	0.9	20	1.15	12
ZCDC10-V254+	2000-50000	10	1.3	23	1.08	13
ZCDC10-V654+	6000-50000	10	1.1	21	1.14	13
ZCDC10-V1854+	18000-50000	10	1.2	20	1.14	13
ZCDC13-V154+	1000-50000	13	1.4	21	1.14	13
ZCDC20-V1854+	18000-50000	20	0.8	21.5	1.12	16
ZCDC10-K5R44W+	500-40000	10	1.3	23	1.12	15
ZCDC10-K0144+	1000-40000	10	2.2	16	1.22	19
ZCDC10-K0244+	2000-40000	10	1.2	23	1.11	15
ZCDC10-K0644+	6000-40000	10	1.0	24	1.12	17
ZCDC10-K1844+	18000-40000	10	1.2	21	1.22	17
ZCDC13-K0144+	1000-40000	13	1.5	19	1.73	13
ZCDC13-K0244+	2000-40000	13	0.95	24	1.11	20
ZCDC13-K1844+	18000-40000	13	0.9	21	1.13	20
ZCDC13-K26344+	26500-40000	13	0.9	21	1.22	20
ZCDC16-K5R44W+	500-40000	16	2.0	19	1.19	20
ZCDC16-K0144+	1000-40000	16	1.3	20	1.22	19
ZCDC16-K0244+	2000-40000	16	1.2	20	1.19	20
ZCDC16-K1844+	18000-40000	16	0.7	23	1.10	20
ZCDC20-K0144+	1000-40000	20	1.2	20	1.20	20
ZCDC20-K0244+	2000-40000	20	1.0	20	1.17	20
ZCDC20-K0644+	6000-40000	20	0.7	22	1.07	20
ZCDC20-K1844+	18000-40000	20	0.7	19	1.17	20
ZCDC30-K0644+	6000-40000	30	0.5	22	1.12	20
ZCDC30-K1844+	18000-40000	30	0.6	22	1.15	20



# DIPLEXERS

DS

## DIPLEXERS

50Ω DC to 6000 MHz

### LTCC Diplexers

- Small size
- Temperature stable
- Rugged construction



Model Number	Passband MHz	Passband IL (dB)	Rejection (dB)	Return Loss (dB)	Package Size
DPGE-252-492R++	2400-2500	0.4	36 @ 4800-6000	33	0805
	4900-5950	0.5	25 @ 800-2500	25	
DPJC-252-492R+	2400-2500	0.7	28 @ 4800-6000	18	0603
	4900-5950	0.7	34 @ 800-2500	26	
DPNK-252-492R+	2400-2500	0.4	26 @ 4800-6000	31	0402
	5150-5850	1.2	40 @ 2400-2690	23	
LDP-1050-252+	1-1050	0.6	31 @ 1650 - 2500	15	1206
	1650-2500	1	21 @ 1-1050	8	
LDPG-212-322+	DC-2100	0.5	22 @ 3200 - 5000	14	0805
	2600-5000	0.8	18 @ DC - 2040	16	
LDPG-272-492+	DC-2700	0.5	30 @ 4800 - 8000	16	0805
	4900-5750	0.7	23 @ DC - 2700	14	
LDPQ-132-33+	DC-1280	1	15 @ 1620 - 3000	15	1008
	1550-3000	1.5	15 @ DC - 1240	15	
LDPW-162-242+	DC-1650	0.6	20 @ 2500 - 6000	20	0603
	2400-6000	0.6	15 @ DC - 1650	16	

### HIGHLIGHTS

- ▶ Expanded selection of LTCC diplexers as small as 0402



# EQUALIZERS

## HIGHLIGHTS

- ▶ Expanded selection of MMIC fixed slope equalizers
- ▶ Wide bandwidth up to 45 GHz

50Ω DC to 45 GHz

**MMIC Fixed Slope Equalizers**

- Performance to 45 GHz in QFN package
- Slope values from 0 to 12 dB
- Tiny size, 2x2mm



NEW RELEASES	Frequency Range (MHz)	Slope (dB) Typ.	Insertion Loss @ Freq. High (dB)	VSWR (:1) Typ.	Max Input Power (dBm)
EQY-3-453+	DC-45000	3.5	0.9	1.24	30
EQY-4-453+	DC-45000	4.1	1.1	1.24	29
EQY-5-453+	DC-45000	5.1	1.1	1.29	28
EQY-6-453+	DC-45000	6.1	1.1	1.29	28
EQY-7-453+	DC-45000	7	1.3	1.23	27
EQY-8-453+	DC-45000	7.9	1.2	1.17	27
EQY-9-453+	DC-45000	8.6	1.5	1.22	28
EQY-10-453+	DC-45000	9.6	1.8	1.27	28
EQY-0-24+	DC-20000	-0.37	0.39	1.1	33
EQY-2-24+	DC-20000	2.1	0.9	1.16	31
EQY-3-24+	DC-20000	3.1	0.7	1.15	34
EQY-5-24+	DC-20000	5.1	0.7	1.24	34
EQY-6-24+	DC-20000	6.3	0.5	1.22	31
EQY-8-24+	DC-20000	8.3	0.8	1.18	34
EQY-10-24+	DC-20000	10.2	0.9	1.18	33
EQY-12-24+	DC-20000	12	1.4	1.09	30
EQY-0-63+	DC-6000	-0.1	0.14	1.07	33
EQY-1-63+	DC-6000	1.2	0.4	1.24	31
EQY-2-63+	DC-6000	2.1	0.4	1.29	31
EQY-3-63+	DC-6000	3.2	0.6	1.29	31
EQY-4-63+	DC-6000	4.2	0.6	1.25	31
EQY-5-63+	DC-6000	5	1	1.24	31
EQY-6-63+	DC-6000	6.5	0.5	1.2	32
EQY-8-63+	DC-6000	8.2	0.5	1.21	31
EQY-10-63+	DC-6000	10.2	1	1.12	31

50Ω DC to 45 GHz

**MMIC Fixed Slope Equalizer Die**

- Bare die form for chip and wire assemblies
- Available in small quantity gel paks, partial and full production wafers



NEW RELEASES	Frequency Range (MHz)	Slope (dB) Typ.	Insertion Loss @ Freq. High (dB)	VSWR (:1) Typ.	Max Input Power (dBm)
EQY-3-453-D+	DC-45000	3.5	1.1	1.22	30
EQY-4-453-D+	DC-45000	4.5	1.1	1.23	29
EQY-5-453-D+	DC-45000	5.5	1.1	1.26	28
EQY-6-453-D+	DC-45000	6.5	1.1	1.25	28
EQY-7-453-D+	DC-45000	7.4	1.3	1.26	27
EQY-8-453-D+	DC-45000	8.2	1.2	1.14	27
EQY-9-453-D+	DC-45000	9	1.6	1.21	28
EQY-10-453-D+	DC-45000	10.2	1.8	1.22	28
EQY-2-24-D+	DC-20000	2.1	0.9	1.26	31
EQY-3-24-D+	DC-20000	3	0.8	1.24	34
EQY-5-24-D+	DC-20000	4.9	0.8	1.34	34
EQY-6-24-D+	DC-20000	6.1	0.7	1.3	31
EQY-8-24-D+	DC-20000	8	1.1	1.31	34
EQY-10-24-D+	DC-20000	10	1.1	1.28	33
EQY-12-24-D+	DC-20000	11.9	1.5	1.17	30
EQY-1-63-D+	DC-6000	1.2	0.4	1.24	31
EQY-2-63-D+	DC-6000	2.1	0.4	1.29	31
EQY-3-63-D+	DC-6000	3.2	0.6	1.29	31
EQY-4-63-D+	DC-6000	4.2	0.6	1.25	31
EQY-5-63-D+	DC-6000	5	1	1.24	31
EQY-6-63-D+	DC-6000	6.5	0.5	1.2	32
EQY-8-63-D+	DC-6000	8.2	0.5	1.21	31
EQY-10-63-D+	DC-6000	10.2	1	1.12	31

# FILTERS

## HIGHLIGHTS

- ▶ Integrated LTCC filter/baluns
- ▶ New LTCC filters with smaller size and higher rejection
- ▶ Reflectionless filters extend coverage up to 30 GHz
- ▶ New additions to suspended substrate lineup
- ▶ Cavity filters with expanded passband width

50Ω DC to 6000 MHz

### Ceramic Resonator Bandpass Filter

- Low insertion loss with excellent power handling
- Low profile designs with min. height of 0.120"
- Excellent temperature stability
- Rugged construction



Model Number	Passband (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
CBP-1414A+	1402-1426	1310-1352	30	1480-3000	30

50Ω 690 to 5875 MHz

### LTCC Balun Bandpass Filters

- Filter and balun integrated in a single monolith
- Ideal for conversion between single-ended and balanced lines
- Tiny size, as small as 1008



NEW RELEASES	Passband (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
Model Number					
BFG2-552R+	4900-5875	3500	49	-	-
BBFCV-492+	4650-5150	50-4000	20	6696-8049	22
BBFCV-2250+	1710-2610	10-1240	17	3390-5400	27
BFG1-252R+	2400-2500	1000-2000	39	4800-5000	49
BFNL2-252R+	2400-2500	1710-1910	38	4800-5000	42
BFCN-1801+	1400-2320	1000	25	3110	23
BLFCV-1570+	690-1570	2200-6000	20	-	-

50Ω 690 to 1570 MHz

### LTCC Balun Low Pass Filter

- Filter and balun integrated in a single monolith
- Ideal for conversion between single-ended and balanced lines
- Tiny size, as small as 1008



NEW RELEASE	Passband F1 (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
Model Number					
BLFCV-1570+	690-1570	2200-6000	20	-	-

50Ω 2900 to 16000

### LTCC High Pass Filter

- Small size (0.079 x 0.049 x 0.037")
- Good power handling



NEW RELEASE	Passband F1 (MHz)	Fc (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
Model Number						
HFCG-2750+	2900-16000	2750	DC-1000	36	1000-2000	34
HFCG-3000+	3400-13000	3000	DC-2350	30	-	-
HFCG-1760+	1800-8000	1560	DC-800	38	800-1200	36
HFCG-2100+	2200-6000	2100	DC-1050	40	DC-1320	20
HFCG-1500+	1600-6000	1400	DC-800	40	800-1000	35
HFCG-1600+	1650-5000	1563	DC-700	53	DC-950	34
HFCG-1100+	1400-3900	1050	DC-700	20	DC-530	40

50Ω 8000 to 24000 MHz

### LTCC Band Pass Filters

- Small size
- High rejection in upper stopband



Model Number	Passband (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
BFCN-5151+	4120-6440	3000	24	8820	32
BFCN-3491+	2790-4370	2150	21	5950	30
BFCN-2491+	1950-3190	1440	22	4500	29

50Ω 4800 to 9000 MHz

### Suspended Substrate High Pass Filters

- Ultra-wide passband width
- Low insertion loss
- Fast roll-off with wide stopband
- Good power handling and temperature stability



NEW RELEASE	Passband (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
Model Number					
ZHSS-K18G+	18000-40000	DC-11700	80	11700-13600	40
ZHSS-K11G+	11000-40000	DC-6500	80	6500-8500	40
ZHSS-11G-S+	11000-24000	DC-6000	80	6000-9000	30
ZHSS-8G-S+	8000-24000	5300-5800	20	DC-5300	40
ZHSS-2G-S+	2000-14000	DC-500	80	500-1150	30

50Ω 9100 to 30000 MHz

**Connectorized Reflectionless High Pass Filter**

- Patented design eliminates in band spurs
- Passband up to 30 GHz
- 2.92mm connectorized housing



Model Number	Passband (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
ZXHF-K912+	9100-30000	DC-1400	6.9	1400-7100	14.3

50Ω DC to 4500 MHz

**Coaxial LTCC Low Pass Filters**

- SMA connectorized housings
- Rugged unibody construction
- Good rejection
- Temperature stable



NEW RELEASES	Passband F1 (MHz)	Fc (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
Model Number						
VLFG-1000+	DC-1000	1370	1550-3000	29	3000-10000	34
VLFG-900+	DC-850	1000	1300-4500	45	4500-11000	21
VLFG-630+	DC-630	780	1050-1500	50	1500-8500	21
VLFG-575+	DC-575	725	1020-2500	32	2500-4400	25
VLFG-530+	DC-530	670	980-2600	31	2600-4000	27
VLFG-490+	DC-490	590	800-1500	52	1500-8500	17
VLFG-400+	DC-400	520	800-2500	31	2500-4500	23
VLFG-320+	DC-320	440	660-2000	33	2000-6000	25

50Ω 10700 to 14500 MHz

**Cavity Bandpass Filters**

- New models with wider passband
- Very fast roll-off with wide stopband



Model Number	Passband (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
ZVBP-13R1G-S+	11700-14500	DC-11000	56	15000-22000	42
ZVBP-11R7G-S+	10700-12750	DC-10200	54	13200-20000	46

50Ω DC to 7000 MHz

**LTCC Low Pass Filter**

- Very good insertion loss
- Rugged ceramic construction
- Tiny size, 0805
- Excellent power handling



NEW RELEASES	Passband F1 (MHz)	Passband F2 (MHz)	Stopband F3 (MHz)	Rejection @ F3 (dB)	Stopband F4 (MHz)	Rejection @ F4 (dB)
Model Number						
LFCG-612+	4900-6100	7500	8200	20	9800-12200	30
LFCG-3800+	DC-3900	5000	5800-8400	40	8400-18000	20
LFCG-3500+	DC-3500	3970	4800-5000	35	8500-15000	25
LFCG-3000+	DC-3000	3460	4550-7000	50	11000-15000	25
LFCG-2850+	DC-2850	3250	3800-4400	20	4400-12000	30
LFCG-2750+	DC-2750	3150	4000-7200	50	7200-16000	25
LFCG-2600+	DC-2600	3000	3850-7000	50	7000-15000	25
LFCG-2500+	DC-2500	2870	3500-4000	33	7000-10000	30
LFCG-2250+	DC-2250	2500	2800-3600	20	3600-8000	30
LFCG-1800+	DC-1800	2030	2450-7000	40	7000-10000	35
LFCG-1700+	DC-1700	2025	2400-2800	20	2800-8000	30
LFCG-1575+	DC-1575	1850	2175-2400	20	2400-7000	40
LFCG-1400+	DC-1400	1650	2015-6600	50	6600-10000	35
LFCG-1200+	DC-1200	1470	1865-3700	50	3700-10000	30
LFCG-1000+	DC-1000	1370	1550-1900	20	1900-6000	30
LFCG-92+	DC -990	1400	1700	20	1800-2700	30
LFCG-900+	DC-850	1000	1300-1600	48	4500-11000	20
LFCG-630+	DC-630	780	1050-1500	48	1500-8500	15
LFCG-575+	DC-575	725	1020-2500	30	2500-4400	25
LFCG-530+	DC-530	670	980-2600	30	2600-4000	25
LFCG-490+	DC-490	590	800-1500	48	1500-8500	15
LFCG-42+	DC -435	475	625	20	650-2700	30
LFCG-400+	DC-400	520	800-2500	30	2500-4500	20
LFCG-320+	DC-320	440	660-2000	33	2000-6000	20



# SPLITTERS

## SP SPLITTERS

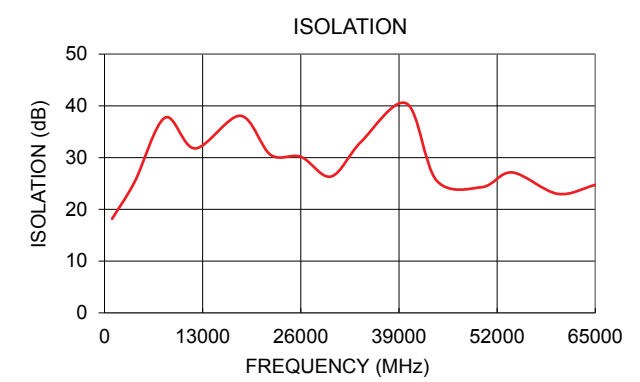
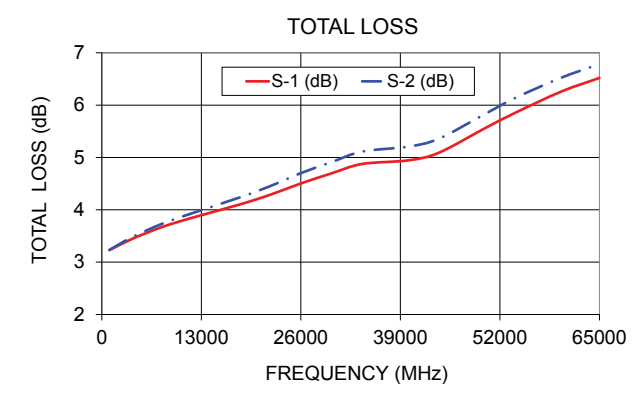
50Ω 1000 to 65000 MHz  
**1.85mm Connectorized Splitter/Combiners**

- Ultra-wideband
- Low insertion loss
- High isolation
- Low unbalance



New Releases	N-Ways	Frequency Range (MHz)	Isolation (dB), Typ.	Insertion Loss (dB) Above 3dB	Phase Unbalance (deg)	Amplitude Unbalance (dB)	Power Input (W) as Splitter, Max.
ZC2PD-E18653+	2	18000-65000	29	1.2	2.5	0.13	12
ZC2PD-E1864+	2	18000-60000	28	1	1.6	0.1	12
ZC2PD-E6653+	2	6000-65000	31	1	1.7	0.06	12
ZC2PD-E2653+	2	2000-65000	30	1.2	1.9	0.1	12
ZC2PD-E1653+	2	1000-65000	32	1.8	1.3	0.1	12

ZC2PD-E1653+ Curves



- ▶ Expanded selection of 65 GHz power splitters
- ▶ New MMIC splitters up to 43.5 GHz
- ▶ Tiny LTCC splitter/combiners
- ▶ High-power 2-Way splitters up to 100W

50Ω 10 to 6200 MHz  
**High Power 2-Way Splitters/Combiners**

- High power
- Low insertion loss
- Excellent VSWR
- Good isolation



New Release	N-Ways	Frequency Range (MHz)	Isolation (dB), Typ.	Insertion Loss (dB) Above 3dB	Phase Unbalance (deg)	Amplitude Unbalance (dB)	Power Input (W) as Splitter, Max.
<b>Model Number</b>							
ZACS622-100W+	2	650-6200	22	0.5	2	0.1	100
ZACS362-100W+	2	600-3600	18	0.6	1	0.15	100
ZACS242-100W+	2	500-2450	22	0.8	2	0.1	100
ZB2PD-62-50W+	2	30-610	20	0.7	1	0.15	50
ZA2CS-62-40W+	2	100-600	22	0.8	0.9	0.2	40
ZA2CS-600-10W	2	100-600	27	0.4	0.4	0.15	10
ZA2CS-500-15W	2	200-500	31	0.3	0.3	0.1	15
ZA2CS-251-20W+	2	10-250	20	0.25	0.5	0.05	25

50Ω 2800 to 4200 MHz  
**2-Way LTCC Power Splitters**

- Low insertion loss
- Excellent amplitude/phase unbalance
- High isolation



New Release	N-Ways	Frequency Range (MHz)	Isolation (dB), Typ.	Insertion Loss (dB) Above 3dB	Phase Unbalance (deg)	Amplitude Unbalance (dB)	Power Input (W) as Splitter, Max.
<b>Model Number</b>							
SCG-2-592+	2	3800-5900	15	0.8	1.5	0.1	2
SCG-2-422+	2	2800-4200	16	0.9	1.5	0.1	2
SCG-2-322+	2	1800-3200	15	0.7	1.5	0.1	2
SCG-2-242+	2	1000-2400	15	0.8	1.5	0.1	2

50Ω 18 to 50 GHz  
**4-Way Stripline Power Splitters**

- Super Wideband
- Low insertion loss
- High isolation
- Low amplitude unbalance



New Release	N-Ways	Frequency Range (MHz)	Isolation (dB), Typ.	Insertion Loss (dB) Above 3dB	Phase Unbalance (deg)	Amplitude Unbalance (dB)	Power Input (W) as Splitter, Max.
<b>Model Number</b>							
ZC4PD-V1854+	4	18000-50000	30	1.6	3.4	0.12	16
ZC4PD-K1844+	4	18000-40000	27	1.2	3.5	0.12	20
ZC4PD-18263-S+	4	18000-26500	28	1.1	2.5	0.1	20

50Ω 12 to 43.5 GHz  
**2-Way MMIC Power Splitters**

- Wide bandwidth
- High isolation
- Low cost for 5G applications
- Tiny size, 2x2mm



Model Number	N-Ways	Frequency Range (MHz)	Isolation (dB), Typ.	Insertion Loss (dB) Above 3dB	Phase Unbalance (deg)	Amplitude Unbalance (dB)	Power Input (W) as Splitter, Max.
EP2-5G1+	2	12000-43500	23	1.3	1.7	0.1	0.5
EP2-5G+	2	24000-30000	23	1.3	1.7	0.1	0.5
EP2KA+	2	10000-43500	17	2.2	9.6	0.57	1.25
EP2K1+	2	2000-26500	20	2.4	5.4	0.3	2.5
EP2K+	2	5000-20000	20	2.1	4.2	0.1	2.5
EP2C+	2	1800-12500	16	1.1	6.0	0.2	1.85
EP2W+	2	700-6000	19.8	1.3	0.9	0.1	2.5
EP2W1+	2	500-9500	19.4	0.8	1.7	0.1	2.5
EP2RCW+	2	DC-8000	23	4.8	0.9	0.02	0.3
EP2RKU+	2	DC-18000	26.1	3.3	1.1	0.02	0.3

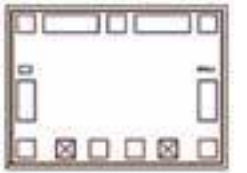


# SWITCHES

## SW SWITCHES

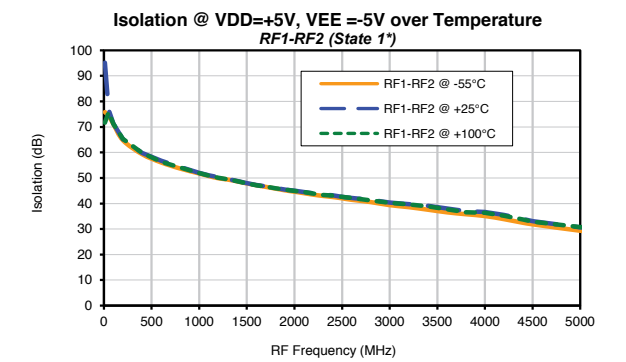
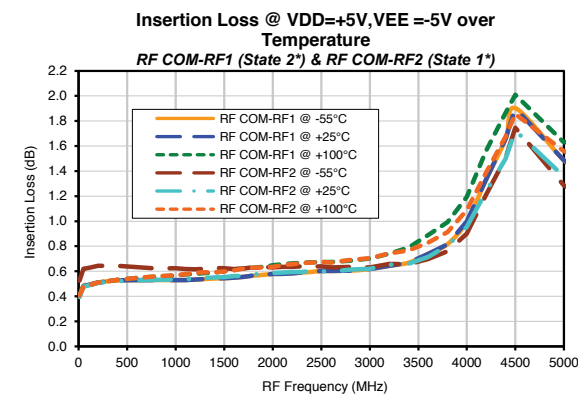
50Ω DC to 4500 MHz  
**SPDT Switch Die**

- High isolation, up to 56 dB
- High input IP3, up to +47.3 dBm
- Low insertion loss, 0.6 dB
- Fast rise/fall time, 3.3 ns/ 4.6 ns

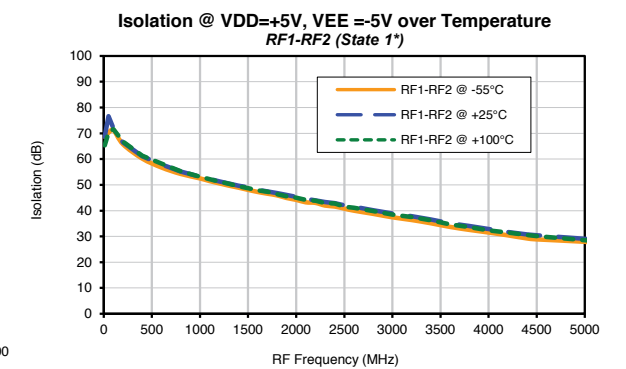
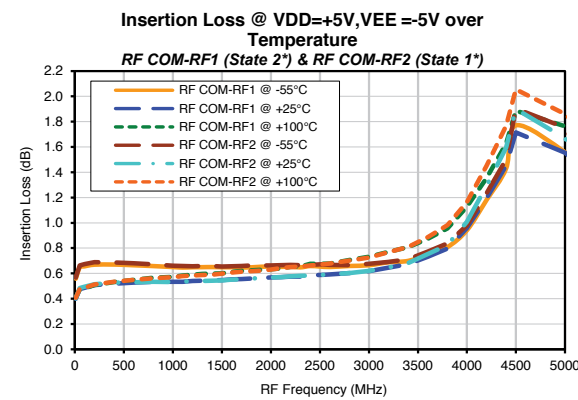


Model Number	Frequency Range (MHz)	Driver	Insertion Loss (dB), typ.	1 dB Compression (dBm)	Input IP3 (dBm)	In-Out Isolation (dB), typ.	Switch "Type"
M3SW-250DRA-D+	DC-4500	CMOS	0.6	25	47.3	48	Reflective
M3SWA-250DRBDG+	DC-4500	CMOS	0.6	25	46.5	56	Absorptive

### M3SW-250DRA-D+



### M3SWA-250DRBDG+



### HIGHLIGHTS

- ▶ New absorptive SPDT die switch
- ▶ Low insertion loss



# TEST SOLUTIONS

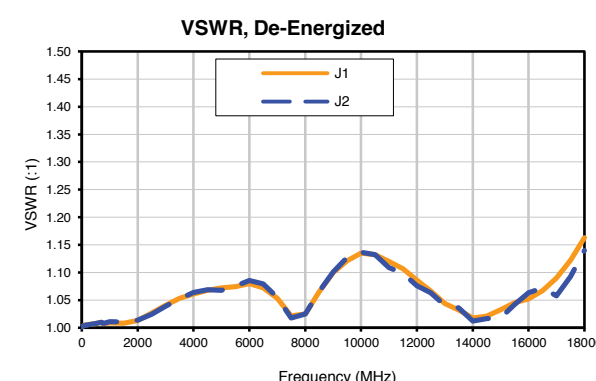
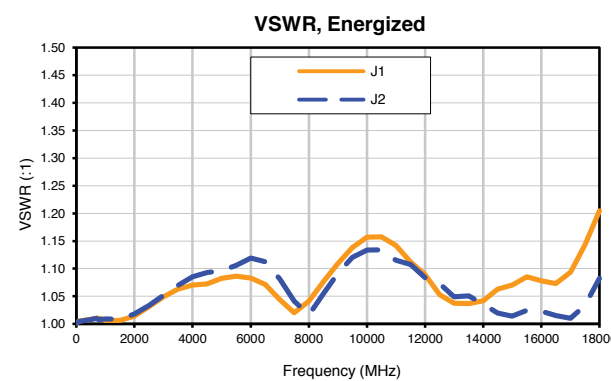
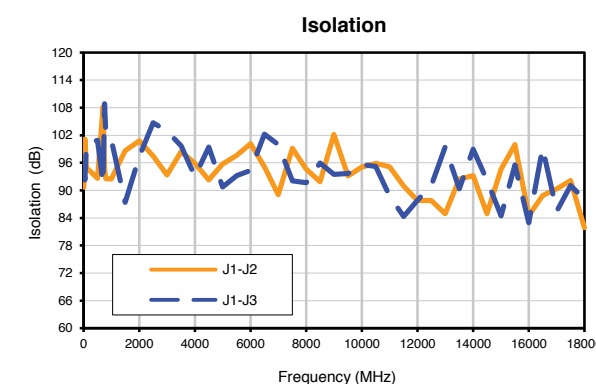
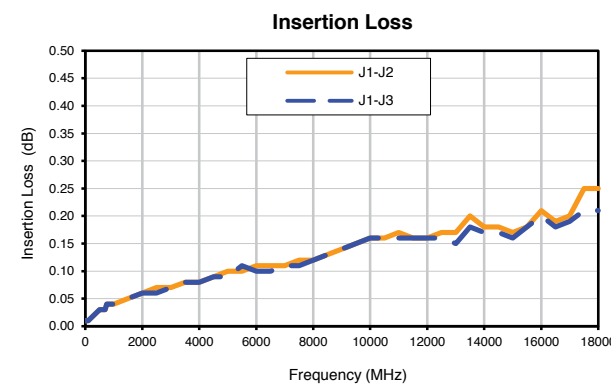
50Ω DC to 26500 MHz

## RF Transfer Switch Matrix

- 3 mechanical transfer switches
- High reliability, 10 million transfer switch cycles
- High isolation, 85 dB
- USB and Ethernet control
- GUI and API included



Model Number	Switch Type	Number of Switches	Frequency Range (GHz)	Insertion Loss (dB)	Isolation (dB)	VSWR (:1)	RF Power (W), Max.
RC-3MTS-18	3	DC-18000	0.2	86	1.15	10	20



### HIGHLIGHTS

- ▶ New RF transfer switch matrix
- ▶ Wideband from DC to 18 GHz

# TRANSFORMERS

## HIGHLIGHTS

- ▶ New high-power core & wire transformer, 12.5/50Ω
- ▶ New MMIC balun transformer die up to 24 GHz

50Ω 700 to 6000 MHz

**LTCC Balun Transformer**

- Wideband
- Miniature size
- Aqueous washable
- Low cost



NEW RELEASES	Single Ended to Single ended	Single Ended to Balanced	Balanced to Balanced	Center Tap	DC Isolation	Frequency Range (MHz)	Impedance Ratio
Model Number							
TCW1-6000+	N	Y	N	N	Y	3200-6000	1
TCW2-6000+	N	Y	N	N	Y	3100-6000	2
TCW2-63+	N	Y	N	N	Y	4900-5875	2
TCW1-3901+	N	Y	Y	N	N	3300-3900	1
TCW1-392+	N	Y	N	N	Y	3300-3900	1
TCW2-392+	N	Y	N	N	Y	3300-3900	2
TCW1-33+	N	Y	N	N	Y	2300-3000	1
TCW2-282+	N	Y	N	N	Y	700-2800	2
TCW2-272+	N	Y	N	N	Y	2100-2700	2
TCW1-272+	N	Y	Y	N	N	1700-2700	1
TCW1-2700+	N	Y	N	N	Y	700-2700	1

12.5/50Ω 20 to 600 MHz

**High Power Core & Wire Transformer**

- High power handling, 50W
- Low insertion loss 0.4 dB
- Small size, 0.93 x 1.22 x 0.47"



Model Number	Single Ended to Single ended	Single Ended to Balanced	Balanced to Balanced	Center Tap	DC Isolation	Frequency Range (MHz)	Impedance Ratio
SERT4-62HP-50W+	Y	N	N	N	N	20-600	0.25

50Ω 4.3 to 3000 MHz

**Surface Mount Core & Wire Transformer**

- Wideband
- Low insertion loss
- Excellent common mode rejection
- Good amplitude unbalance/ low phase unbalance



Model Number	Single Ended to Single ended	Single Ended to Balanced	Balanced to Balanced	Center Tap	DC Isolation	Frequency Range (MHz)	Impedance Ratio
TTC1-33W+	N	Y	N	N	N	4.5-3000	1

75Ω 4.3 to 3000 MHz

**Surface Mount Core & Wire Transformer**

- Wideband
- Low insertion loss
- Excellent common mode rejection
- Good amplitude unbalance/ low phase unbalance



Model Number	Single Ended to Single ended	Single Ended to Balanced	Balanced to Balanced	Center Tap	DC Isolation	Frequency Range (MHz)	Impedance Ratio
TTC1-33W-75+	N	Y	N	N	N	30-3000	1

75Ω 10 to 24 GHz

**MMIC Balun Transformer Die**

- Wideband
- Low insertion loss
- Low amplitude unbalance



NEW RELEASES	Single Ended to Single ended	Single Ended to Balanced	Balanced to Balanced	Center Tap	DC Isolation	Frequency Range (MHz)	Impedance Ratio
Model Number							
MTY2-243+	N	Y	N	N	Y	10000-24000	2
TY2-243-D+	N	Y	N	N	Y	10000-24000	2



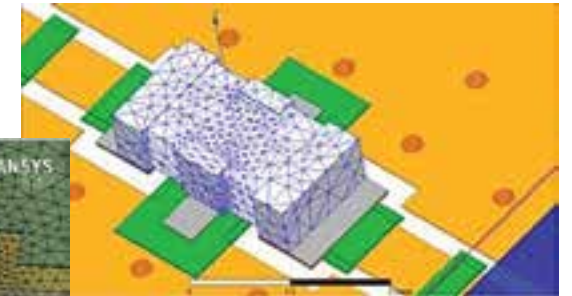
# COMPANY NEWS

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## COMPANY NEWS

### Free Full 3D Models for ANSYS HFSS®

 **Modelithics**  
Vendor Partner



Mini-Circuits has partnered with modelling and simulation leader, Modelithics to offer full 3D models for ANSYS HFSS for over 40 of

Mini-Circuits' most popular LTCC filters. The models are now available for FREE download from the Modelithics Website as a resource to customers in the simulation stage for new system designs. We are already planning further development of additional 3D models for HFSS on an ongoing basis, and we're thrilled to make our advanced modelling capability for LTCC parts available as an engineering resource to customers.

To learn more about 3D models for HFSS and other high-accuracy simulation models for Mini-Circuits parts from Modelithics, visit: <https://www.modelithics.com/mvp/minicircuits>

### Mini-Circuits Expands Distribution through Mouser Expands to 206 Countries

We're very excited to announce the expansion of Mini-Circuits' distribution partnership with Mouser Electronics, Inc., making Mouser an authorized distributor of Mini-Circuits' product line in 206 countries. The two companies first announced their partnership in March with initial distribution in the U.S. and India. The expanded agreement will give more international customers the convenience and flexibility of ordering Mini-Circuits components through Mouser or directly through Mini-Circuits.



To learn more about the Mini-Circuits products available from Mouser Electronics, visit: <http://www.mouser.com/manufacture/minicircuits/>



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