

Patent Portfolio

August 1, 2022

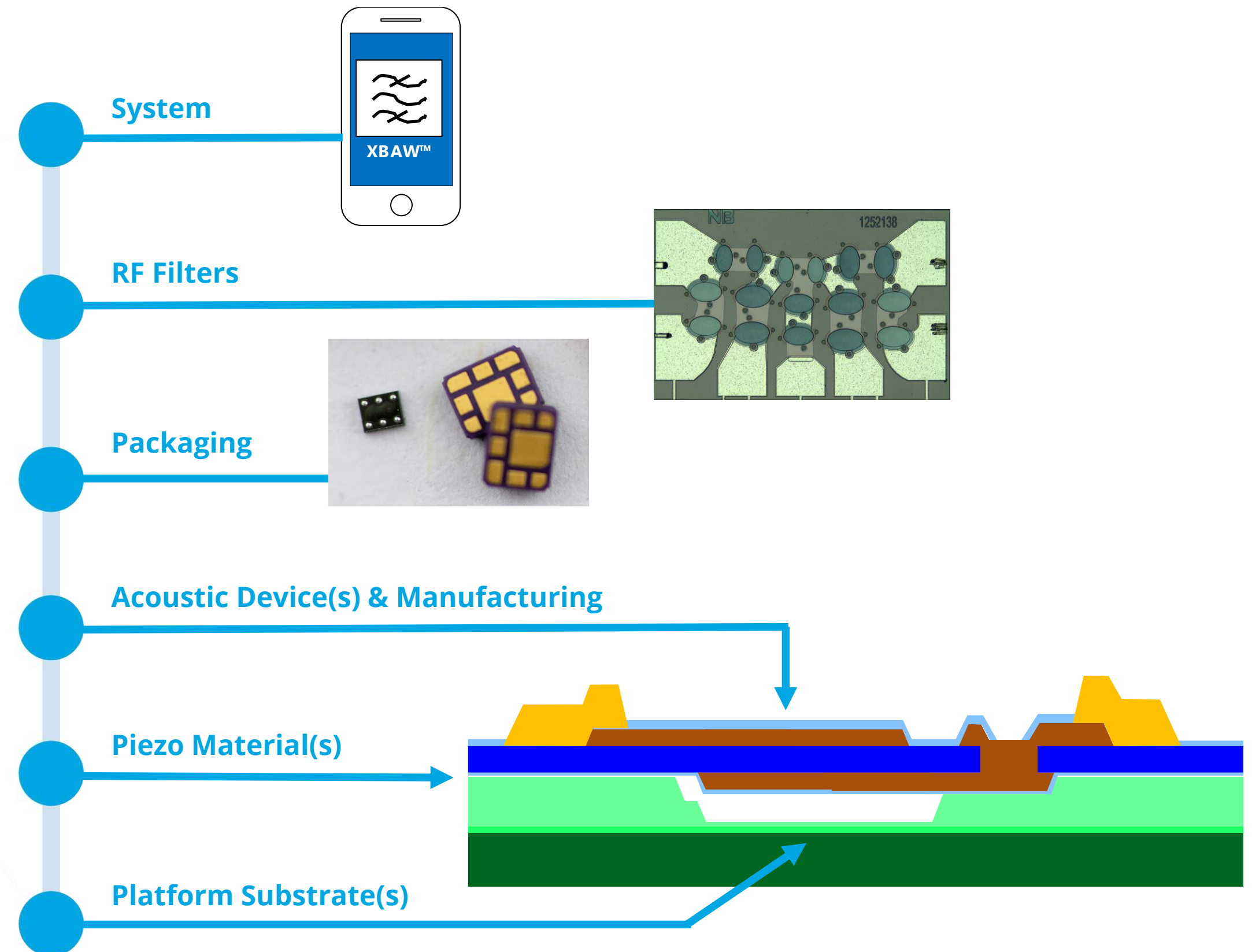
INTELLECTUAL PROPERTY (IP) PORTFOLIO BREAKDOWN

VERTICAL IP PORTFOLIO

AKOUSTIS IP PORTFOLIO

64 patents, 107 patent filings pending, plus numerous trade secrets [1]

<https://www.akoustis.com/patents>



Patent Detail

Patent Number	Title	Issue Date
CN 205195673 U	WAFER-LEVEL PACKAGE DEVICE	4/27/2016
CN 205195752 U	MOBILE COMMUNICATION SYSTEM	4/27/2016
CN 205212799 U	A SUBSTRATE FOR ACOUSTIC RESONATOR EQUIPMENT	5/4/2016
US 9,362,887	INTEGRATED CIRCUIT CONFIGURED WITH TWO OR MORE SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICES	6/7/2016
CN 205657658 U	A SUBSTRATE AND ACOUSTIC RESONATOR EQUIPMENT FOR ACOUSTIC RESONATOR EQUIPMNET	10/19/2016
CN 205725676 U	WAFER SCALE PACKAGE APPARATUS	11/23/2016
US 9,537,465	ACOUSTIC RESONATOR DEVICE WITH SINGLE CRYSTAL PIEZO MATERIAL AND CAPACITOR ON A BULK SUBSTRATE	1/3/2017
US 9,571,061	INTEGRATED CIRCUIT CONFIGURED WITH TWO OR MORE SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICES	2/14/2017
CN 206100080 U	MOBILE COMMUNICATION DEVICE CONFIGURED WITH A SINGLE CRYSTAL PIEZO RESONATOR STRUCTURE	4/12/2017
US 9,673,384	RESONANCE CIRCUIT WITH A SINGLE CRYSTAL CAPACITOR DIELECTRIC MATERIAL	6/6/2017
US 9,716,581	MOBILE COMMUNICATION DEVICE CONFIGURED WITH A SINGLE CRYSTAL PIEZO RESONATOR STRUCTURE	7/25/2017
US 9,805,966	WAFER SCALE PACKAGING	10/31/2017
US 9,912,314	SINGLE CRYSTAL ACOUSTIC RESONATOR AND BULK ACOUSTIC WAVE FILTER	3/6/2018
US 9,917,568	MEMBRANE SUBSTATE STRUCTURE FOR SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICE	3/13/2018
US 10,084,588	MOBILE COMMUNICATION DEVICE CONFIGURED WITH A SINGLE CRYSTAL PIEZO RESONATOR STRUCTURE	9/25/2018
US 10,110,188B2	STRUCTURE AND METHOD OF MANUFACTURE FOR ACOUSTIC RESONATOR OR FILTER DEVICES USING IMPROVED FABRICATION CONDITIONS AND PERIMETER STRUCTURE MODIFICATIONS	10/23/2018
US 10,110,189B2	STRUCTURE AND METHOD OF MANUFACTURE FOR ACOUSTIC RESONATOR OR FILTER DEVICES USING IMPROVED FABRICATION CONDITIONS AND PERIMETER STRUCTURE MODIFICATIONS	10/23/2018
US 10,110,190B2	STRUCTURE AND METHOD OF MANUFACTURE FOR ACOUSTIC RESONATOR OR FILTER DEVICES USING IMPROVED FABRICATION CONDITIONS AND PERIMETER STRUCTURE MODIFICATIONS	10/23/2018
US 10,211,804	METHOD OF MANUFACTURING INTEGRATED CIRCUIT CONFIGURED WITH TWO OR MORE SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICES	2/19/2019
US 10,217,930	METHOD OF MANUFACTURE FOR SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICES USING MICRO-VIAS	2/26/2019

Patent Detail (Cont'd)

Patent Number	Title	Issue Date
US 10,256,786	COMMUNICATION FILTER USING SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICES	4/9/2019
US 10,319,898	RESONANCE CIRCUIT WITH A SINGLE CRYSTAL CAPACITOR DIELECTRIC MATERIAL	6/11/2019
US 10,355,659	PIEZOELECTRIC ACOUSTIC RESONATOR MANUFACTURED WITH PIEZOELECTRIC THIN FILM TRANSFER PROCESS	7/16/2019
US 10,431,490	WAFER SCALE PACKAGING	10/1/2019
US 10,431,580	MONOLITHIC SINGLE CHIP INTEGRATED RADIO FREQUENCY FRONT END MODULE CONFIGURED WITH SINGLE CRYSTAL ACOUSTIC FILTER DEVICES	10/1/2019
CN 106575957 B	INTEGRATED CIRCUIT CONFIGURED WITH A CRYSTAL ACOUSTIC RESONATOR DEVICE	12/17/2019
US 10,516,377	METHOD OF MANUFACTURE FOR SINGLE CRYSTAL CAPACITOR DIELECTRIC FOR A RESONANCE CIRCUIT	12/24/2019
US 10,523,180	METHOD AND STRUCTURE FOR SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICES USING THERMAL RECRYSTALLIZATION	12/31/2019
US 10,581,398	METHOD OF MANUFACTURE FOR SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICES USING MICRO-VIAS	3/3/2020
US 10,615,773	WIRELESS COMMUNICATION INFRASTRUCTURE SYSTEM CONFIGURED WITH A SINGLE CRYSTAL PIEZO RESONATOR AND FILTER STRUCTURE	4/7/2020
US 10,673,513	FRONT END MODULE FOR 5.2 GHZ WI-FI ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT	6/2/2020
US 10,727,811	IMPROVED EFFECTIVE COUPLING COEFFICIENTS FOR STRAINED SINGLE CRYSTAL EPITAXIAL FILM BULK ACOUSTIC RESONATORS	7/28/2020
US 10,855,243	MOBILE COMMUNICATION DEVICE CONFIGURED WITH A SINGLE CRYSTAL PIEZO RESONATOR STRUCTURE	12/1/2020
US 10,855,250	COMMUNICATION FILTER FOR LTE BAND 41	12/1/2020
US 10,855,247	ELLIPTICAL STRUCTURE FOR BULK ACOUSTIC WAVE RESONATOR	12/1/2020
US 10,873,317	BULK ACOUSTIC WAVE RESONATOR FILTERS INCLUDING REJECTION-BAND RESONATORS	12/22/2020
US 10,879,872	BAW RESONATORS WITH ANTISYMMETRIC THICK ELECTRODES	12/29/2020
US 10,931,251	STRUCTURE AND METHOD OF MANUFACTURE FOR ACOUSTIC RESONATOR OR FILTER DEVICES USING IMPROVED FABRICATION CONDITIONS AND PERIMETER STRUCTURE MODIFICATIONS	2/23/2021
US 10,957,688	MONOLITHIC SINGLE CHIP INTEGRATED RADIO FREQUENCY FRONT END MODULE CONFIGURED WITH SINGLE CRYSTAL ACOUSTIC FILTER DEVICES	3/23/2021
US 10,979,011	STRUCTURE AND METHOD OF MANUFACTURE FOR ACOUSTIC RESONATOR OR FILTER DEVICES USING IMPROVED FABRICATION CONDITIONS AND PERIMETER STRUCTURE MODIFICATIONS	4/13/2021

Patent Detail (Cont'd)

Patent Number	Title
US 10,979,022	5.2 GHZ WI-FI ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 10,979,023	5.9 GHZ C-V2X AND DSRC ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 10,979,024	5.2 GHZ WI-FI COEXISTENCE ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 10,979,025	5G BAND N79 ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 10,979,026	5.5 GHZ WI-FI 5G COEXISTENCE ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 10,985,732	5.6 GHZ WI-FI ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 10,992,279	STRUCTURE AND METHOD OF MANUFACTURE FOR ACOUSTIC RESONATOR OR FILTER DEVICES USING IMPROVED FABRICATION CONDITIONS AND PERIMETER STRUCTURE
US 11,031,989	FRONT END MODULE FOR 5.2 GHZ WI-FI ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 11,063,576	FRONT END MODULE FOR 5.6 GHZ WI-FI ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 11,063,204	METHOD OF MANUFACTURE FOR SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICES USING MICRO-VIAS
US 11,070,184	PIEZOELECTRIC ACOUSTIC RESONATOR MANUFACTURED WITH PIEZOELECTRIC THIN FILM TRANSFER PROCESS
US 11,165,404	METHOD FOR FABRICATING AN ACOUSTIC RESONATOR DEVICE WITH PERIMETER STRUCTURES
US 11,177,868	FRONT END MODULE FOR 6.5 GHZ WI-FI ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 11,184,079	FRONT END MODULE FOR 5.5 GHZ WI-FI ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT
US 11,211,918	IMPROVED EFFECTIVE COUPLING COEFFICIENTS FOR STRAINED SINGLE CRYSTAL EPITAXIAL FILM BULK ACOUSTIC RESONATORS
US 11,245,376	SINGLE CRYSTAL ACOUSTIC RESONATOR AND BULK ACOUSTIC WAVE FILTER
US 11,245,382	METHOD AND STRUCTURE FOR SINGLE CRYSTAL ACOUSTIC RESONATOR DEVICES USING THERMAL RECRYSTALLIZATION
US 11,316,496	METHOD AND STRUCTURE FOR HIGH PERFORMANCE RESONANCE CIRCUIT WITH SINGLE CRYSTAL PIEZOELECTRIC CAPACITOR DIELECTRIC MATERIAL
US 11,348,798	METHODS OF FORMING INTEGRATED CIRCUIT DEVICES USING CUTTING TOOLS TO EXPOSE METALIZATION PADS THROUGH A CAP STRUCTURE AND RELATED CUTTING DEVICES
US 11,349,453	BULK ACOUSTIC WAVE RESONATOR FILTERS INCLUDING REJECTION-BAND RESONATORS

Patent Detail (Cont'd)

Patent Number	Title	Issue Date
US 11,356,071	PIEZOELECTRIC ACOUSTIC RESONATOR WITH IMPROVED TCF MANUFACTURED WITH PIEZOELECTRIC THIN FILM TRANSFER PROCESS	6/7/2022
US 11,394,451	FRONT END MODULE FOR 6.1 GHz Wi-Fi ACOUSTIC WAVE RESONATOR RF FILTER CIRCUIT	7/19/2022
US 11,398,402	WAFER SCALE PACKAGING	7/26/2022

Licensed/Optioned Patent Detail

Patent Number	Title	Assignee	Patent Issue Date
US 7,250,360	SINGLE STEP, HIGH TEMPERATURE NUCLEATION PROCESS FOR A LATTICE MISMATCHED SUBSTRATE	Cornell Research Foundation, Inc.	7/31/2007