

FEATURES

- 127-note ROM memory
- 1.35V to 3.3V power supply and low power consumption
- RC oscillator on chip
- One shot or level hold mode
- Sound range: 4 octaves, 2 series
- Tempo: 16 kinds (presto-largo)
- Direct piezo drive

FUNCTIONS

- Solution of automatic stop or repeat of the melody
- Dynamic speaker can be driven with external NPN transistor
- Two or three times repeat of melody (mask option)
- Each note can be individually programmed to be staccato or legato (mask option)
- Changing the contents of melody is possible by reprogramming the maskable ROM
- Power on reset; melody begins from the first note
- Start from the head of melody
- Bare chip or TO-92 are available

FUNCTIONAL DESCRIPTION

The BT8028C is a CMOS LSI chip which electronically plays a prearranged melody. Selection of melody start signal is possible by mask option: orders specification suffix "L" indicate Level Hold Mode, and suffix "S" indicate One Shot Mode.

The Universal version (as One Shot or Level Hold Mode) is possible also (suffix "U"), but this version starts by power, only.

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Characteristic	Symbol	Value	Unit
DC Supply Voltage	$V_{CC} - V_{SS}$	-0.3 ~ 3.5	V
Input Voltage	V_{IN}	$V_{SS} - 0.3 \sim V_{CC} - 0.3$	V
Operating Temperature	T_{opr}	-20 ~ +65	°C
Storage Temperature	T_{stg}	-55 ~ +125	°C

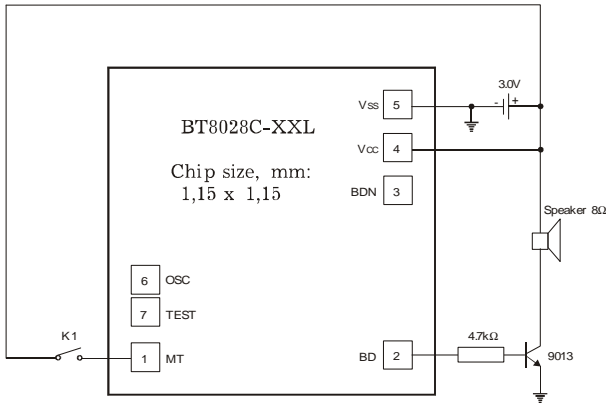
ELECTRICAL CHARACTERISTICS (Ta = 25°C, VCC = 1.5V ; unless otherwise specified)

Characteristic		Symbol	Test Condition	Min	Typ	Max	Unit
Operating Voltage		V_{CC}		1.35	1.5	3.3	V
Supply Current	Stand-by	I_S			0.1	1	μA
	Operating	I_{CC}	Output open			60	
Output Drive Current		I_{OH}	$V_{CC} = 1.35V, V_O = 0.8V$	0.6	1.5		mA
Output Sink Current		I_{OL}	$V_{CC} = 1.35V, V_O = 0.5V$	0.6	1.5		mA

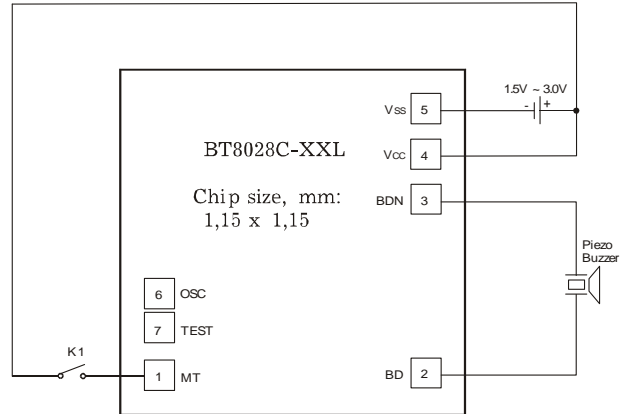


APPLICATION CIRCUITS

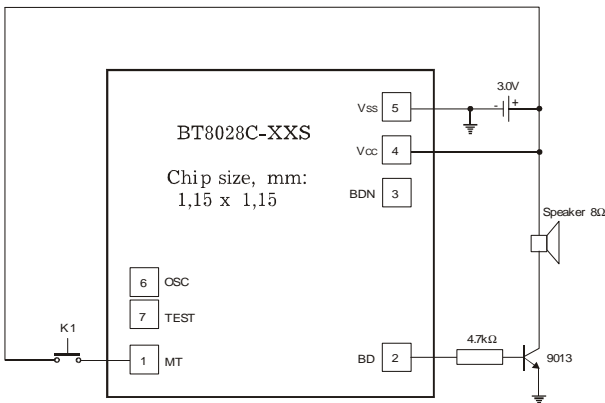
LEVEL HOLD FOR SPEAKER



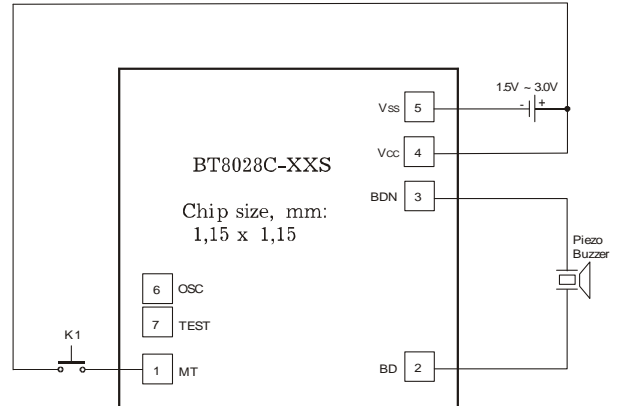
LEVEL HOLD FOR PIEZO



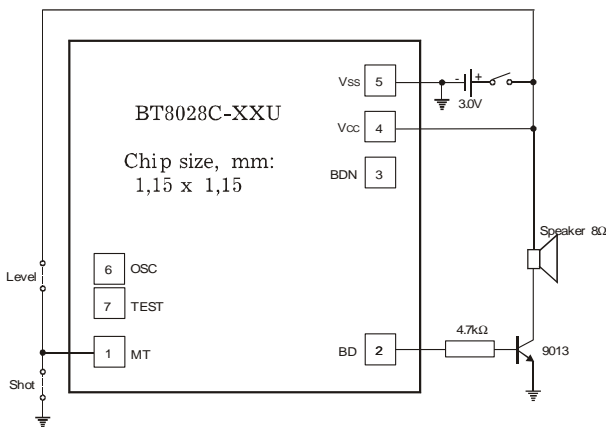
ONE SHOT FOR SPEAKER



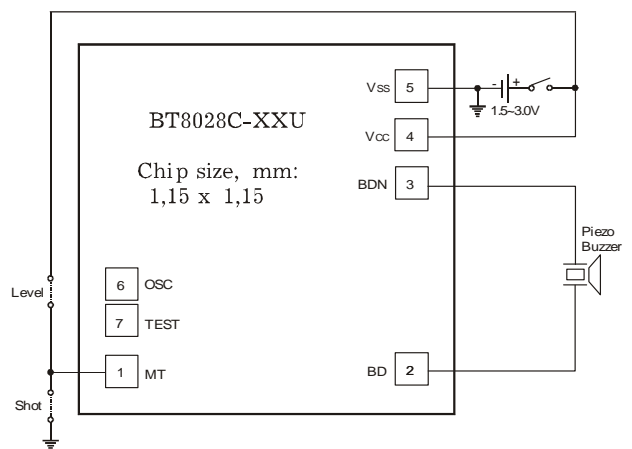
ONE SHOT FOR PIEZO



UNIVERSAL FOR SPEAKER

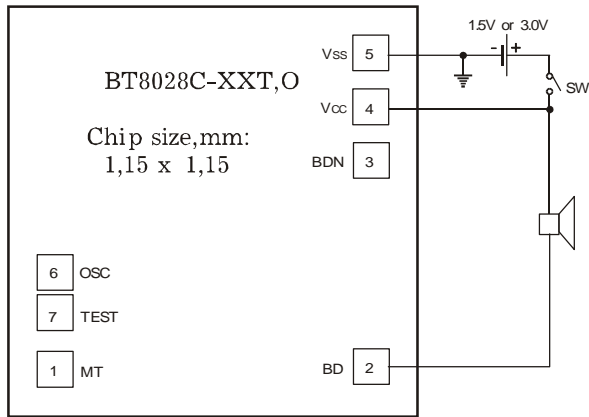


UNIVERSAL FOR PIEZO

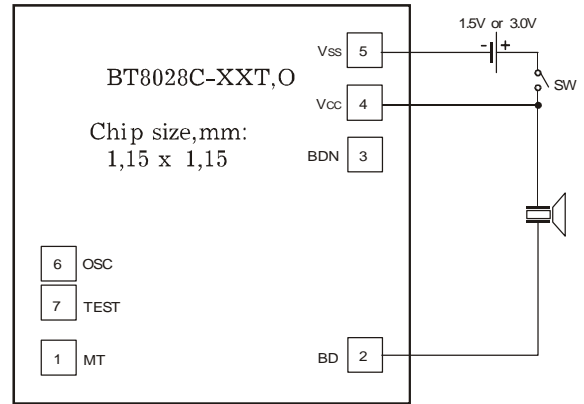


NOTE: The chip substrate is connected to V_{SS}.
UNIVERSAL BT8028C-XXT,O

FOR SPEAKER

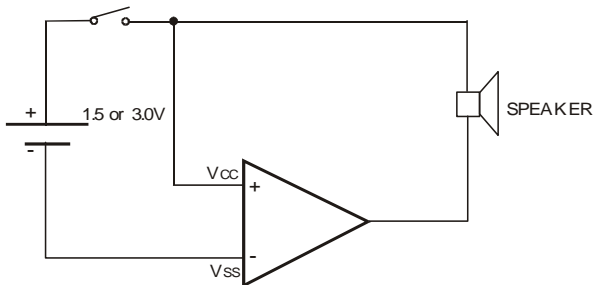


FOR PIEZO

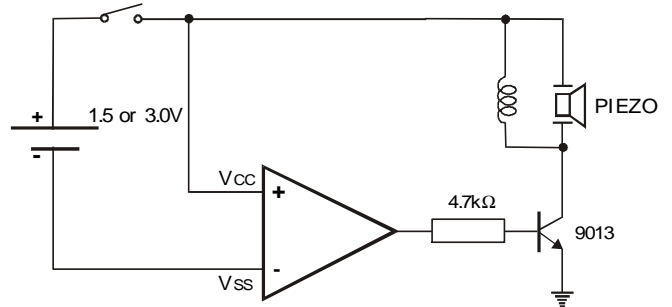


NOTE: The chip substrate is connected to V_{SS}.

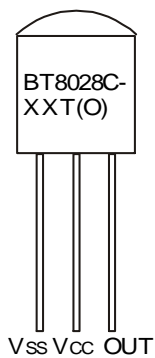
BT8028C (TO-92) FOR SPEAKER



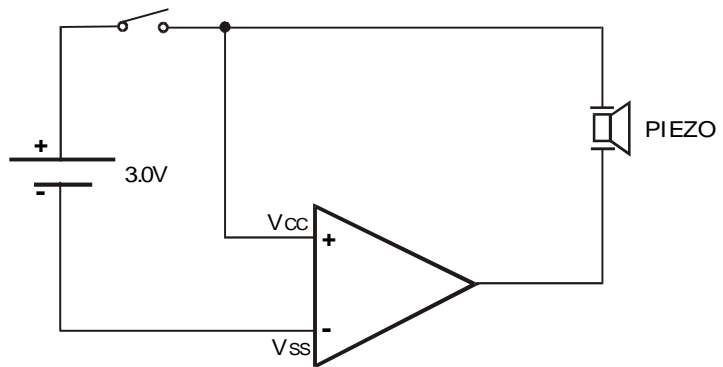
BT8028C (TO-92) FOR PIEZO WITH EXTERNAL TRANSISTOR



PIN CONFIGURATION



BT8028C (TO-92) FOR DIRECT PIEZO

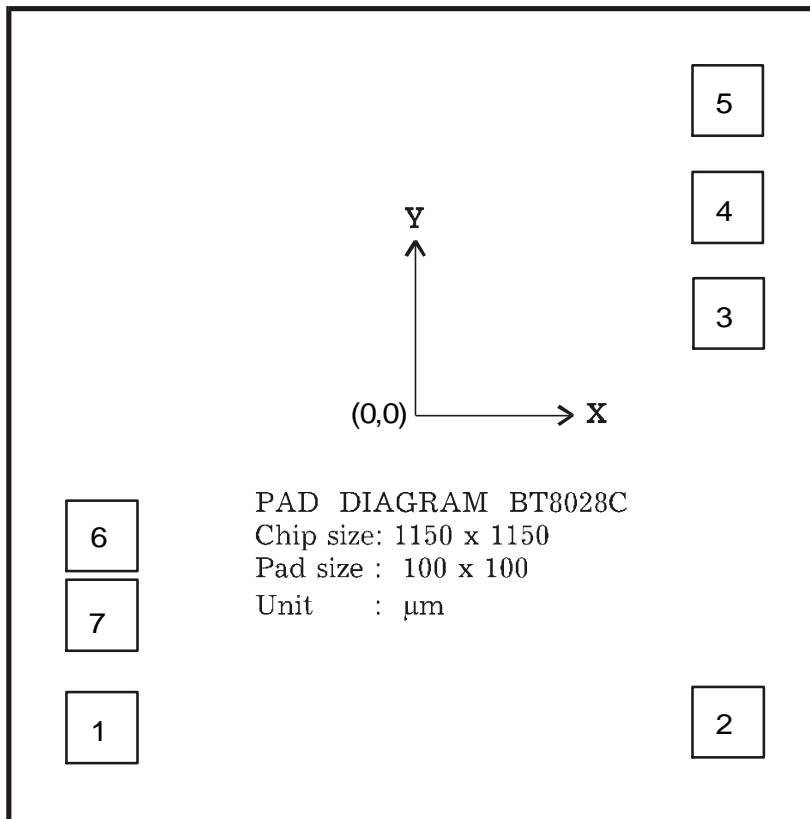


AVAILABLE SONG LIST

NEW EXT No.	SONG LIST	SEC $\pm 20\%$
BT8028C-001	For Elise	13
BT8028C-002	Staff WRK	
BT8028C-003	Happy Birthday	13
BT8028C-004	Jingle Bell	12
BT8028C-005	It's Small World	22
BT8028C-006	3 Children Song	13
BT8028C-007	Cuocoo Waltz	10
BT8028C-008	London Bridge is Falling Down	16
BT8028C-009	Trainis Running Fast	12
BT8028C-010	Love Me Tender Love Me True	34
BT8028C-011	Love Story	24
BT8028C-012	Old McDonald Had a Farm	25
BT8028C-013	Jingle Bell/Santa Claus Is Coming to Town/ We Wish You a Merry X'mas	28
BT8028C-014	You are My Sunshine	20
BT8028C-015	Santa Claus is Coming To Town	20
BT8028C-016	Silent Night	26
BT8028C-017	Twinkle Twinkle Little Star	14
BT8028C-018	Custom Made	27
BT8028C-023	Home Sweet Home	39
BT8028C-026	Custom Made	14
BT8028C-028	Custom Made	24
BT8028C-030	Custom Made	37
BT8028C-035	Custom Made	
BT8028C-045	For Elise 2	15



PAD LAYOUT



NOTE: Substrate is connected to V_{SS} .

PAD LOCATION

Pad No.	Designation	X	Y	Description
1	MT	-445	-445	Melody Start Input
2	BD	445	-435	Melody Output 1
3	BDN	445	145	Melody Output 2
4	V_{CC}	445	295	Positive Power Supply
5	V_{SS}	445	445	Negative Power Supply
6	OSC	-445	-282	Test Pad
7	TEST	-445	-169	Test Pad



AVAILABLE SONG LIST

NEW EXT No.	МАРКИР.	SONG LIST	SEC ±20%
BT8028C-001L	BT66T-19L	For Elise	13
BT8028C-002L		Staff WRK	
BT8028C-003L	BT66T-8L	Happy Birthday	13
BT8028C-003L	BT66T-8S	Happy Birthday	13
BT8028C-004L	BT66T-2L	Jingle Bell	12
BT8028C-004L	BT66T-4-T	Jingle Bell	12
BT8028C-005L	BT66T-68L	It's Small World	22
BT8028C-006L	BT66T-3CS	3 Children Song	13
BT8028C-007L	BT66T-32L	Cuckoo Waltz	10
BT8028C-008L	BT66T-30L	London Bridge is Falling Down	16
BT8028C-009L	BT66T-34L	Trainis Running Fast	12
BT8028C-010L	BT66T-11L	Love Me Tender Love Me True	39
BT8028C-011L	BT66T-12L	Love Story	24
BT8028C-012L		Old McDonald Had a Farm	25
BT8028C-013L	BT66T-13L	Jingle Bell/Santa Claus Is Coming to Town/ We Wish You a Merry X'mas	28
BT8028C-014L	BT66T-6L	You are My Sunshine	20
BT8028C-015L		Santa Claus is Coming To Town	20
BT8028C-016L	BT66T-16L	Silent Night	26
BT8028C-017L		Twinkle Twinkle Little Star	14
BT8028C-018L		Arier	27
BT8028C-019L	BT66T-PR	Phone ringer	12
BT8028C-020L	BT66T-20L	Tree Little Pigs	19
BT8028C-021L	BT66T-MNA	MNA	38
BT8028C-022L		NOV 24 (Cuckoo Waltz 2)	20
BT8028C-023L	BT66T-5L	Home Sweet Home	39
BT8028C-024L	BT66T-24L	Cuckoo Waltz 2	21
BT8028C-025L	BT66T-25S	AZ2	28
BT8028C-026L	BT66T-26L	AZ1	47
BT8028C-027L		7- 40	32
BT8028C-028L	BT66T-28L	AZ3	24
BT8028C-029L	BT66T-AZ4	AZ4	29
BT8028C-030L	BT66T-ALI	IR1	34
BT8028C-030S	BT66T-ALI-S	IR1	34
BT8028C-031L		Hymn of St. Petersburg(in Russian)	53
BT8028C-032L		Russian Anthem (in Russian)	55
BT8028C-033L		My Moskow (in Russian)	27

BT8028C-034L		Home Sweet Home 2	39
BT8028C-035L	BT66T-35L	Bip	0.5
BT8028C-035O	BT66T-35-O	Bip	0.5
BT8028C-036L		Warwara (in Russian)	19
BT8028C-037L		"Arise huge country" (Russian)	24
BT8028C-038L		Birch (Russian)	27
BT8028C-039L		Katyusha (Russian)	25
BT8028C-040L		"Dark Night" (Russian)	44
BT8028C-041L		"Nameless Height"(Russian)	39
BT8028C-042L		"Let us light up" (Russian)	52
BT8028C-043L		"ALEXANDRA" (Russian)	45
BT8028C-044L	BT66T-TVM	IR2	27
BT8028C-045L	BT66T-19L	For Elise 2	15
BT8028C-046L		God Bless America	48
BT8028C-047L		"RED MORNING LIGHT GENTLE" (in Russian)	43
BT8028C-048L		"God Save the Tsar" (in Russian)	29
BT8028C-049L		"Hymn to the U.S."	64
BT8028C-050L		Reg Time	
BT8028C-051L		It's Small World 2	21
BT8028C-052L	BT66T-29L	AZ4-2	21
BT8028C-053L	BT66T-53L	Car Alarm	
BT8028C-054L		"ANTHEM OF KAZAKHSTAN"	49
BT8028C-055L	BT66T-25L	AZ2-2	28
BT8028C-056O	BT66T-56-O	"Karelia"	20
BT8028C-057L	BT66T-57L	4Hz	
BT8028C-058L	BT66T-58L	KEPL1	13
BT8028C-059L		"DREAMS" (Russian)	67
BT8028C-060L		"DAY OF VICTORY" (Russian)	44
BT8028C-061L		"BELOVEZHSKAYA PUSHCHA"(Russian)	36
BT8028C-062L		Oh! fighting Korea	34
BT8028C-063L		Champion	24
BT8028C-064L		March	32
BT8028C-065L	BT66T-65L	Generator 1.4 KHz	
BT8028C-066L		"No we are not carpenters, stokers" (Russian)	28
BT8028C-067L		Air Tale (ленты выведены, не сданы)	20
BT8028C-068L			
BT8028C-069L	BT66T-69L	Alarm 2 (three in one)	13
BT8028C-070L		Hymn of Ukraine	55
BT8028C-071L		Metall	67

BT8028C-072L	BT66T-72L	Pong Dan	24
BT8028C-073L		Anthem of Republic of Tatarstan	60
BT8028C-074L		purple Haze	35
BT8028C-075L		Lighthouse 2	14
BT8028C-076L		The small fir-tree was born in a wood	13
BT8028C-077L		The bells are ringing	
BT8028C-078L	BT66T-CC	Chantara	53
BT8028C-079L		Alarm 3 + driver LED 2Hz	
BT8028C-080L	BT66T-CC	Chempion + Chantara	32
BT8028C-081P	FT66T-2P	Pause 72 sec + Jingle Bell	84
BT8028C-082O	BT8028C-082-O	“bip” + “bip”	2
BT8028C-083L	BT8028C-083-L	SOS	12
BT8028C-084O	BT8028C-084-O	17 moments of Spring	22
BT8028C-085O	BT8028C-085-O	Phone Ringer 1	10
BT8028C-086L	BT66T-35L3	Driver LED with deviation	3
BT8028C-087L		108 sec. pause + JB	

