

GENERAL DESCRIPTION

The EM92217A is a voice synthesizer which can receive serial data from dialer IC ,by decoding data and announce dialing signal to speaker . There are 17 kinds of words provided by EM92217A. The data format is compatible with EM91400/EM91200 series and EM91810A/B .

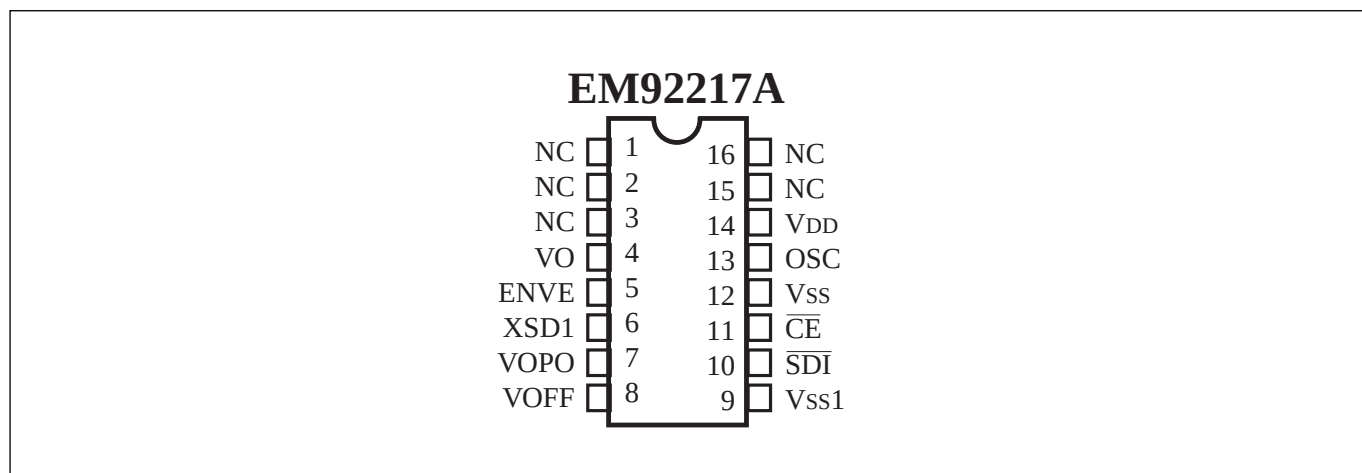
FEATURES

- Announce dialing signal data up to 17 words by woman in chinese .
- Operating voltage: $V_{dd} = 2.4 \sim 5 \text{ V}$.
- Operating current is under 250 μA (at $V_{dd}=3.0\text{V}$,no load)
- Standby current under 1 μA at $V_{dd}=3.0\text{V}$
- Built-in serial data receiver interface.
- Rapidly synthesizes dialing number.
- Mute signal output by ENVE pin to control speech network.
- Voice output indicated signal provided
- Use inexpensive RC oscillator
- Supplied in PDIP 16 pins package.
- Power saving mode provided.

APPLICATIONS

- Speech Telephone
- Announce number system
- Toy

PIN ASSIGNMENTS



PIN DESCRIPTIONS

Symbol	Function
VO	Voice signal output pin.
ENVE	CMOS output pin structure
	Normal “low”, active “high”. When there is voice signal output , this pin will be from “low” to “high”,until the voice signal output finished,then back to “low”.
	This pin is used for mute voice signal , keep the dialing signal from interference.
XSDI	CMOS output pin structure.
	Copy the receiving SDI signal and transfer output pin
	This pin is used for drive next stage,such as the other voice synthesizer,or LCD driver (EM32100,EM32116),.....etc.
VOPO	CMOS output pin structure.
	Voice output indicated signal.Normal “low”,active “high”
	When there is voice output,this pin will become from “low” to “high” about 10 ms ,and back to “low”.This pin can be used to drive LED to indicate voice output.
VOFF	Input pin structure .
	This pin is used to turn off voice output by connect this pin to “high”.
	Connect this pin to “low”,the voice output normally.
SDI	Input pin structure. Need to be pulled up by 10k Ω resistor to V_{DD} .
	Serial data input pin.
$\overline{CE}$	Input pin structure. Need to be pulled up by 10k Ω .resistor to V_{DD} .
	Chip enable input pin ,active “low”.
	When this pin detect “low” signal , it will wake up system ; detect “high” signal ,force the system into sleep.
V_{DD}, V_{SS}	Power supply input pin
OSC	Oscillator input pin. Pull this pin to V_{DD} by 1M Ω resistor will create the RC oscillation about 1MHz for system.
$V_{SS}1$	Connect to V_{SS}

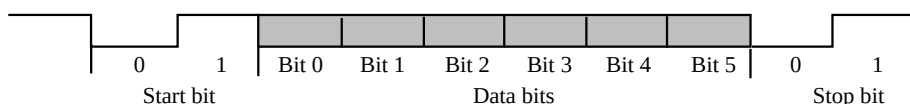
FUNCTION DESCRIPTION

Standby mode:

1. When CE pin = “high” ,the system enter standby mode , and all functions are disabled
2. When CE pin = “ low” ,the system enter active mode ,and the system can receive data by SDI pin,after decoding , output the voice.

The receiving data format

When the EM92217A senses the falling edge of the Start bit, it will sample the input data . The received bit will then be assembled and decoded, and corresponding pattern will be announced to speaker. The serial data format is as follows:



The frequency of every bit is 256Hz (about 3.9 ms)

(b5b4 = 00) Digit key

Key	1	2	3	4	5	6	7	8	9	0	*	#	P	P→T
b3b2b1b0	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110
Announce (English)	one	two	three	four	five	six	seven	eight	nine	zero	star	pound	pause	tone
Announce (Chinese)	一	二	三	四	五	六	七	八	九	零	星	磅	暂停	tones

(b5b4 = 10) function key

Key	ST	(Lock state)	F
b3b2b1b0	0000	0001	1111
Announce (English)	store	lock	flash
Announc (Chinese)	存储	锁	闪光

Reference table:

Keypad	bit5	bit4	bit3	bit2	bit1	bit0	Announce (English)	Announce (Chinese)
1	0	0	0	0	0	1	one	一
2	0	0	0	0	1	0	two	二
3	0	0	0	0	1	1	three	三
4	0	0	0	1	0	0	four	四
5	0	0	0	1	0	1	five	五
6	0	0	0	1	1	0	six	六
7	0	0	0	1	1	1	seven	七
8	0	0	1	0	0	0	eight	八
9	0	0	1	0	0	1	nine	九
0	0	0	1	0	1	0	zero	零
*	0	0	1	0	1	1	star	星
#	0	0	1	1	0	0	pound	磅
P	0	0	1	1	0	1	pause	暂停
*/T(P→T)	0	0	1	1	1	0	tone	tones
ST	1	0	0	0	0	0	store	存储
(Lock state)	1	0	0	0	0	1	lock	锁
F	1	0	1	1	1	1	flash	闪光

Signal output:

When the SDI pin receive the correct format data , then VO pin output the corresponding voice.The voice length is according to the recorded situation.

When voice signal output , the ENVE pin will output a “high” signal to mute control speech network,for not interference dialing signal.

Power saving mode:

When there is no data input from dialer after 4 sec. the VO pin will from "High" to "Low", to save power consumption.

ABSOLUTE MAXIMUM RATINGS

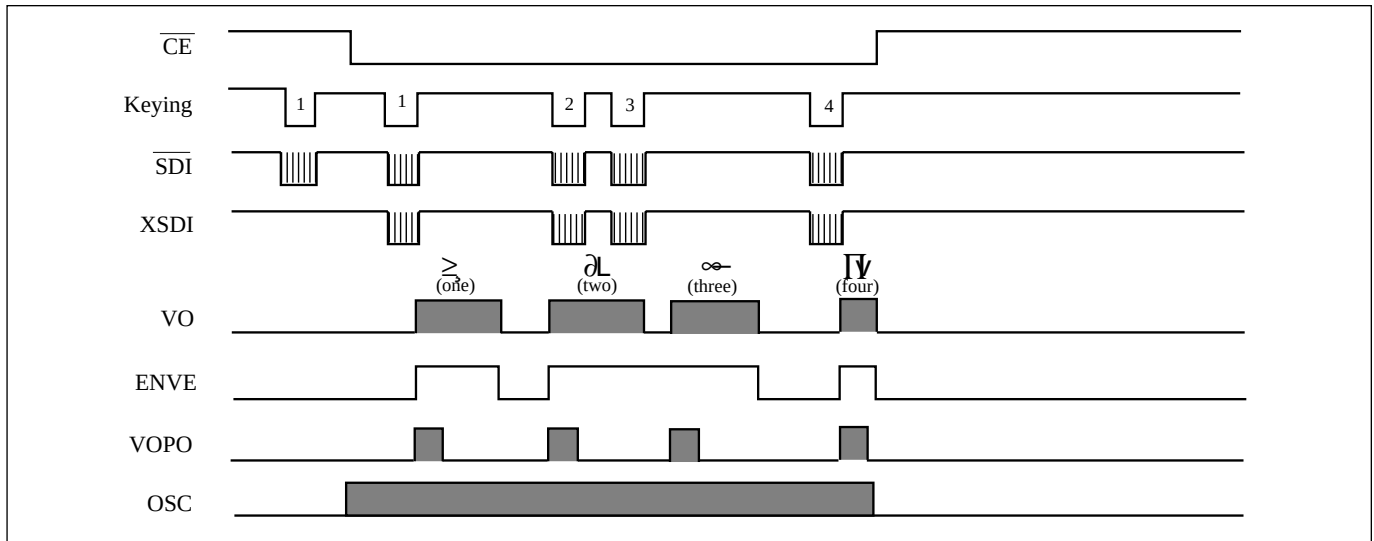
Items	Sym.	Rating	Condition
Supply voltage	V_{DD}	-0.3V to 6.0V	
Input voltage	V_{in}	$V_{SS} - 0.3V$ to $V_{DD} + 0.3V$	
Operating temperature	T_{OPR}	0°C to 50°C	
Storage temperature	T_{STR}	-55°C to 125°C	

DC ELECTRICAL CHARACTERISTICS

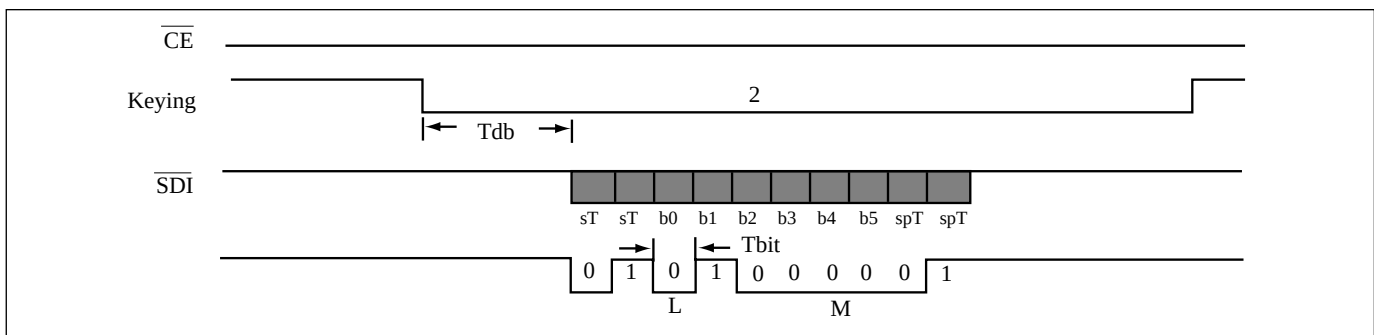
Parameter	Sym.	Condition	Min.	Typ.	Max.	Unit
Operating voltage	Vdd		2.4	3	5.1	V
Operating current (no load)	Idd	Vdd = 3 V	-	-	250	μA
Standby current	Istby	Vdd = 3 V	-	-	1	μA
Drive current (ENVE,XSDI, VOPO pins)	Iod	Vdd=3V,Vo=2.4V	1.0	-	-	mA
Sink current(ENVE,XSDI, VOPO,VOFF,SDI,CE pins)	Ios	Vdd=3V,Vo=0.4V	1.6	-	-	mA
Output current of VO pin	Ivo	Vdd=3V, Vo=0.7V	2.0	3.0	4.0	mA
SDI input data every bit time	Tbit		3.8	3.9	4.1	mS
Oscillation resistor	R	Vdd=3V	-	1.0		MΩ
Oscillator frequency	fosc.	Vdd=3V	-	1	-	MHz

TIMING DIAGRAM

Keying and corresponding Voice output :

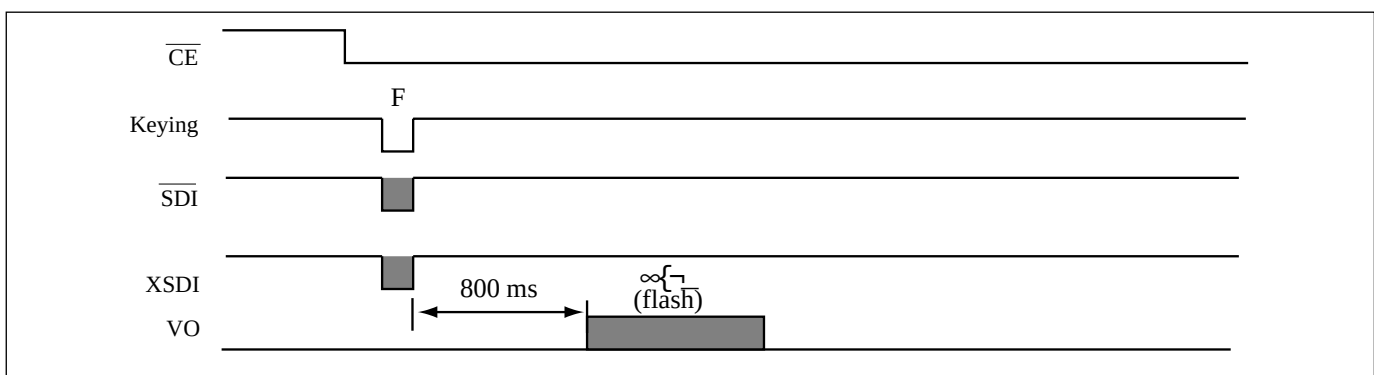


SDO operating timing :



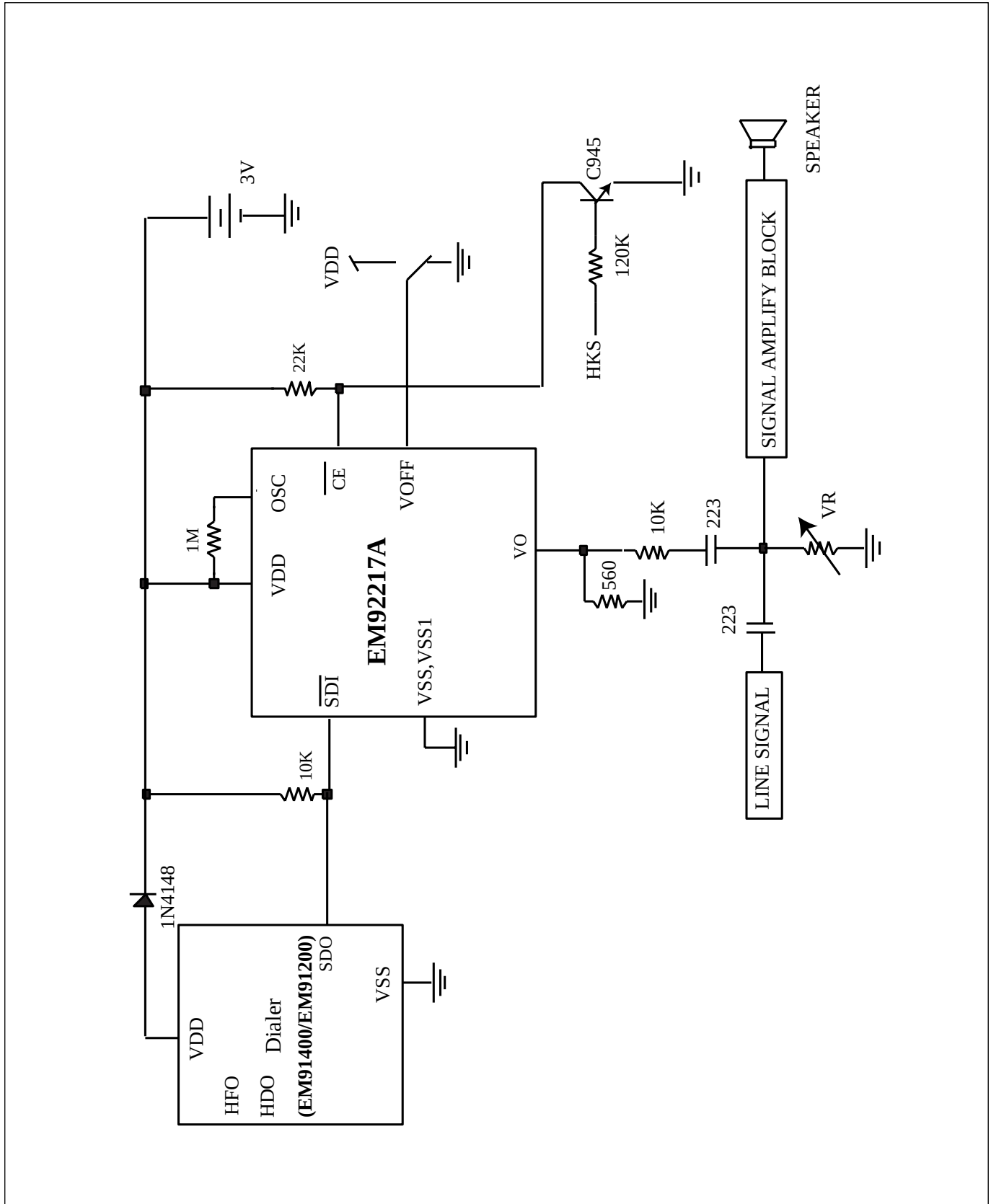
<Note> L=LSB, M=MSB, sT=START bit time, spT=STOP bit time

Flash operating timing :

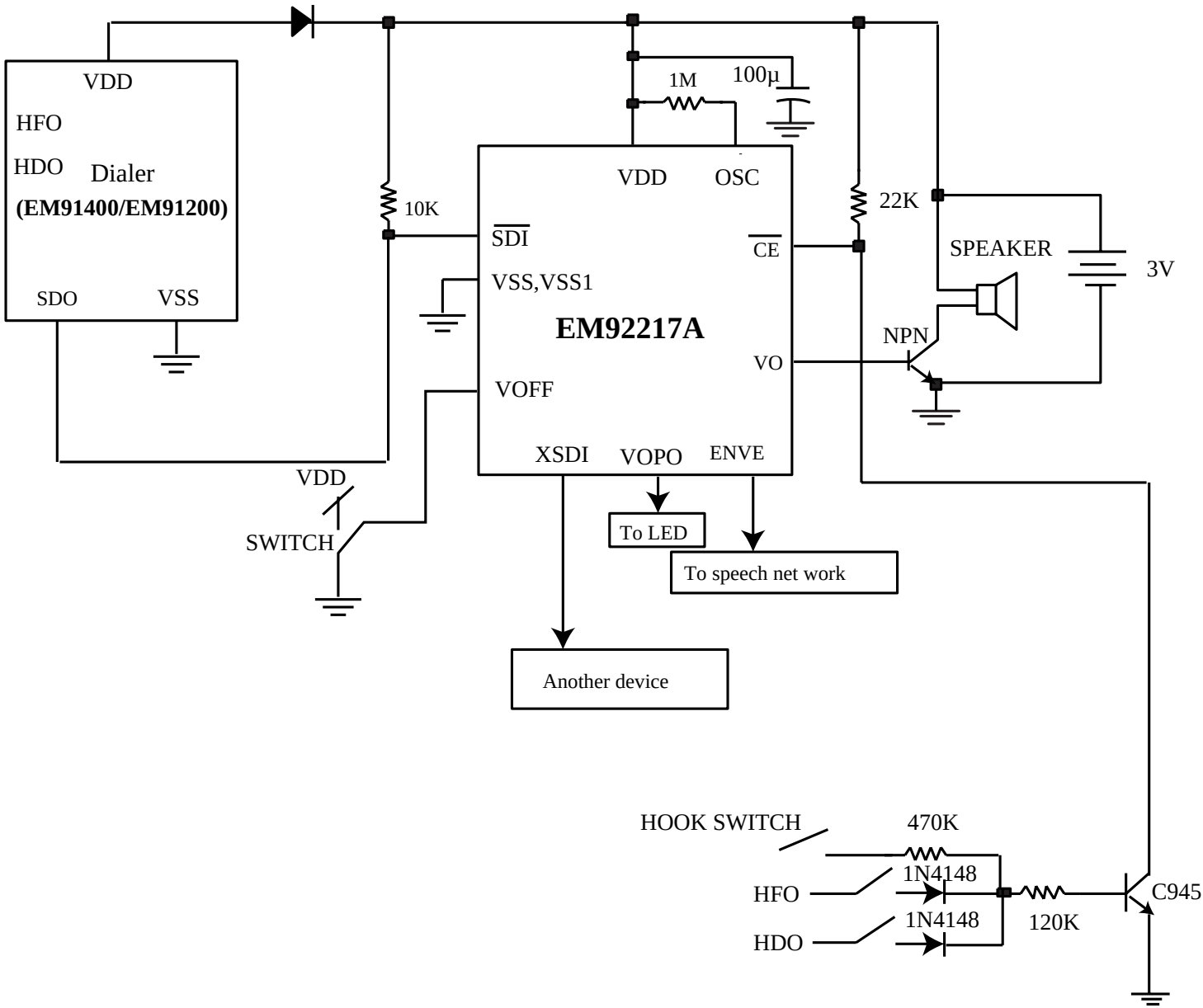


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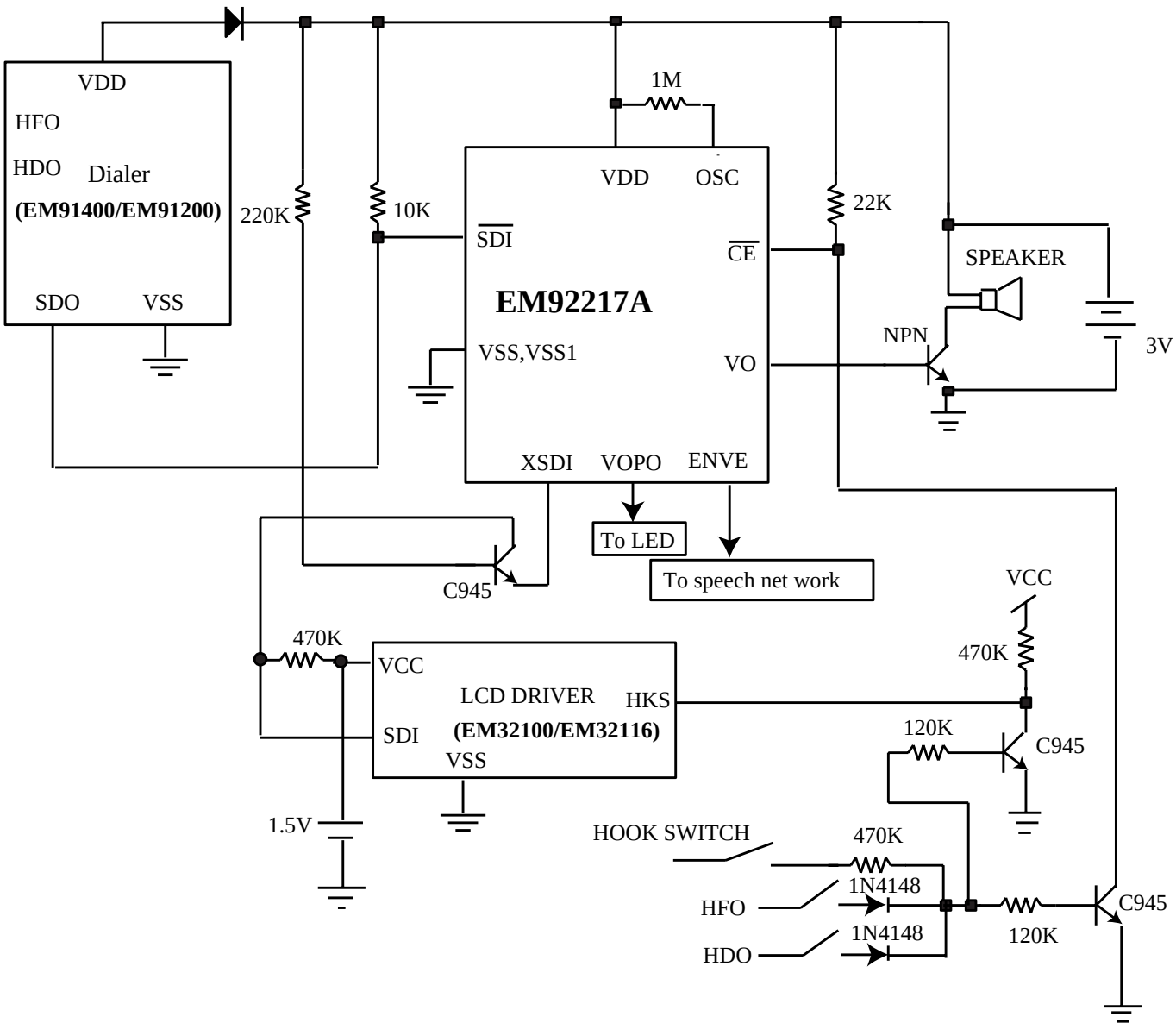
APPLICATION CIRCUIT (①②③④⑤⑥⑦⑧⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛㉜㉝㉞㉟㊱㊲㊳㊴㊵㊶㊷㊸㊹㊺㊻㊼㊽㊾㊿)



APPLICATION CIRCUIT (SETI@E, z; @E#E@Sj^ay#u`HlT)



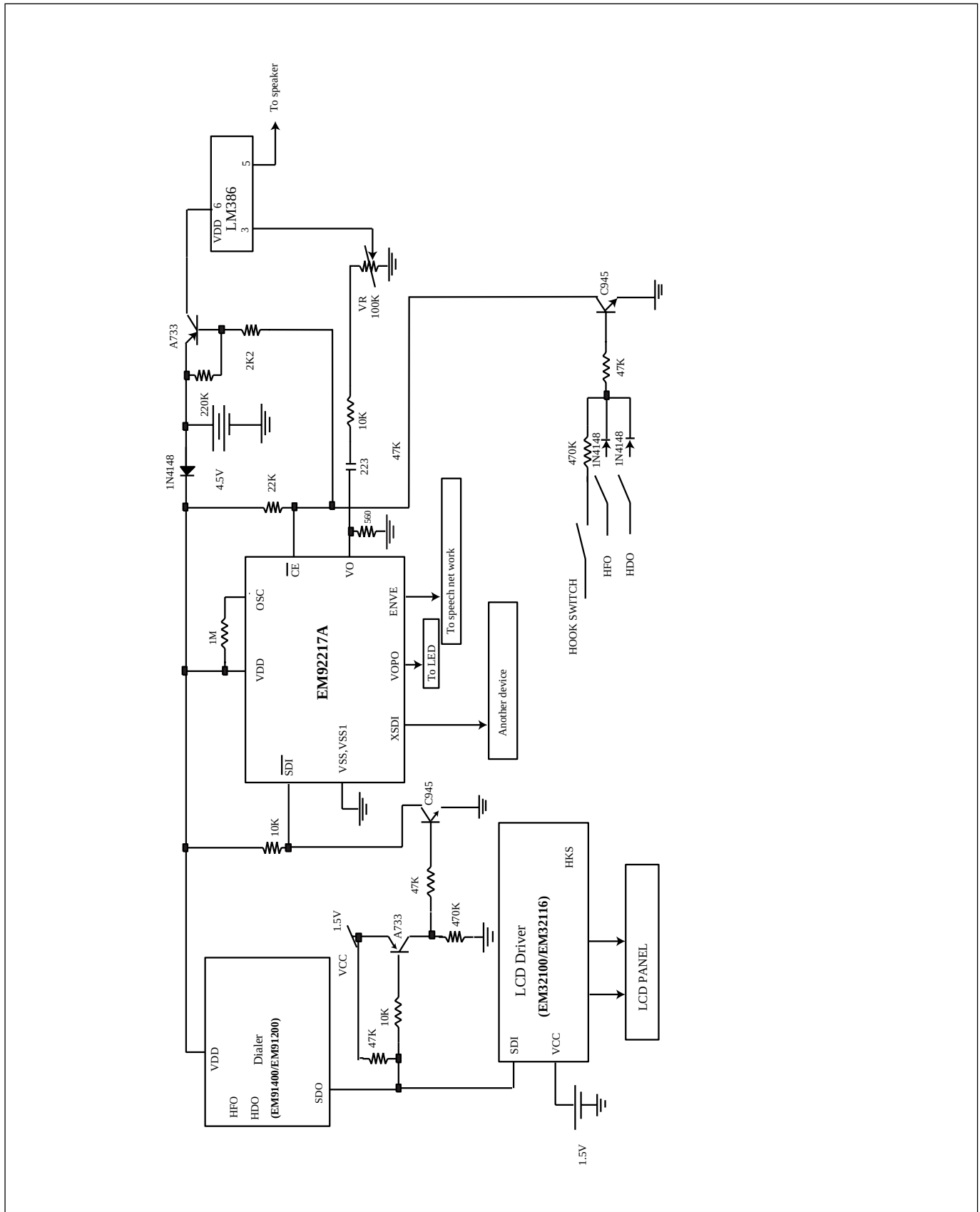
APPLICATION CIRCUIT (SET @ • E₂, • z ; 11 11 speech IC driver LCD driver)



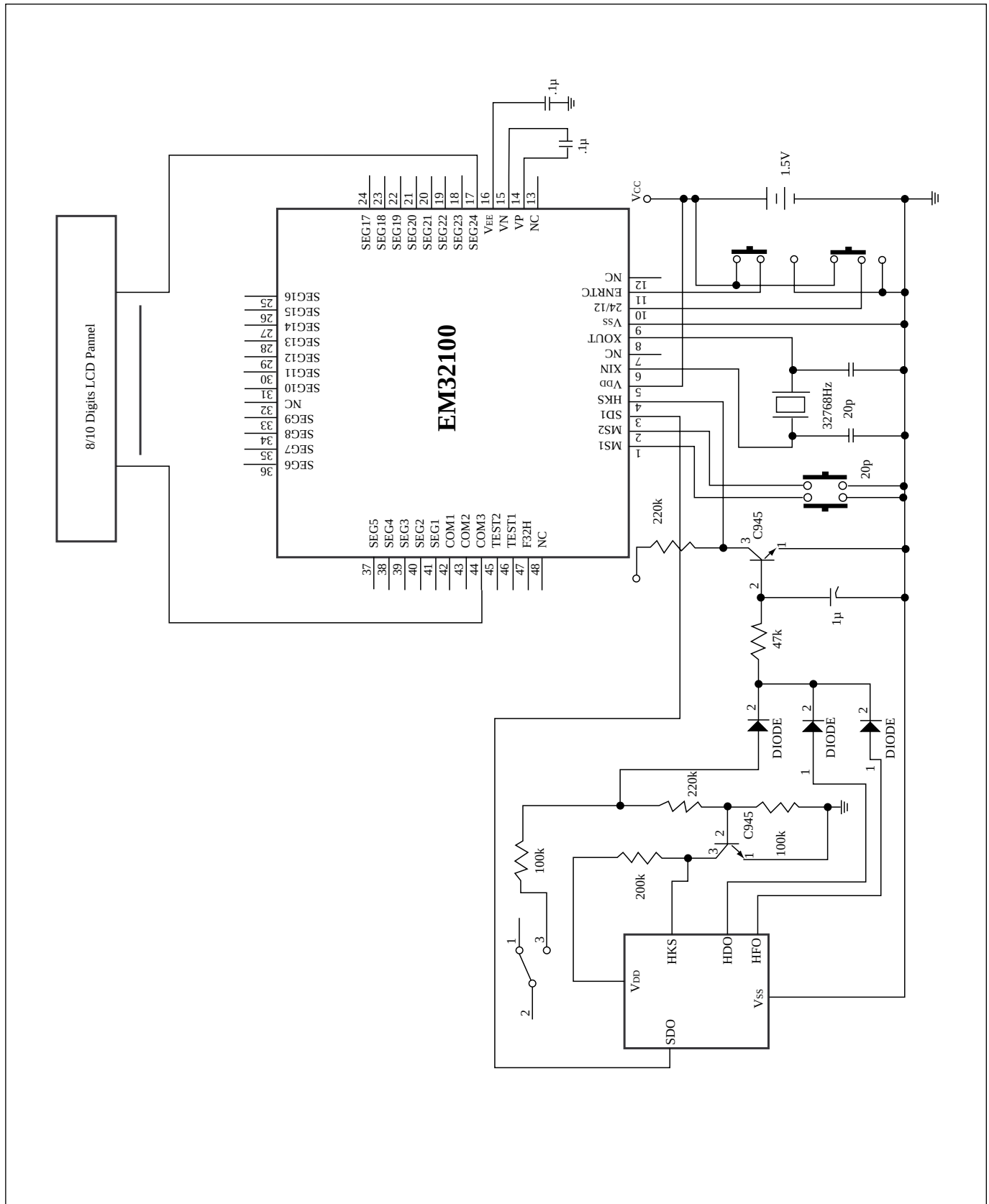
EM92217A
NTHEISIZER



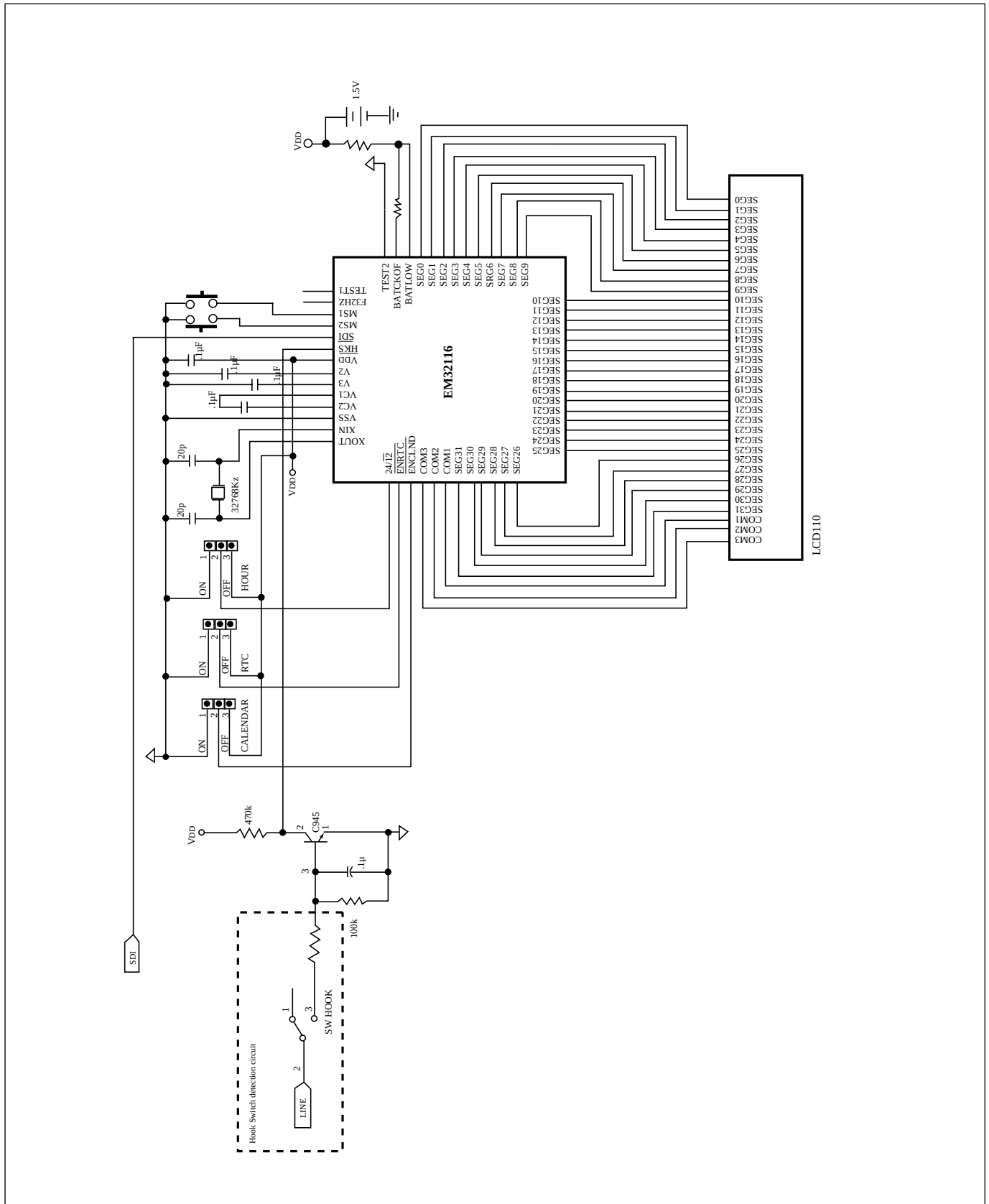
APPLICATION CIRCUIT (SEI@•E, •z ; OP AMP SEI° ; ®√¶ÊSEI°Driver LCD driver)



EM32100 Application Circuit



EM32116 Application Circuit





Product Index :

Product	Version	Status
EM92217A	woman, chinese	ready
EM92217B	woman, english	planning
EM92217C	man, english	planning