Features

- 64 control button
- 256 key code
- Support double key
- Pulse modulation
- Wide angle
- Green product
- Low power consumption
- Suit for home automatic application
- FCC compatible
- CE compatible

GENERAL DESCRIPTION

ECF300 is designed as remote controller IC for home-use consumer product, usually applied to Home-PC, Setup-Box, TV systems. E-CMOS's advance technology delivers small, reliable, very low power consumption, green and cost-effective keyboard remote controller solution.

Based on the RFID technology, E-CMOS's RFID keyboard remote controller IC can work with very low power consumption and hence increase battery life. This provides a green solution to environment pollution and global warming and let your company become a green solution provider.

PIN DESCRIPTION

Pin name	Direction	Description
RXCLK	I	Define clock input when write mode
RXDATA	I/O	Define data I/O when write mode
TX	O	Modulation Signal
DEV[2:0]	I	Define which device is been controlled
CLK_SEL	I	Select internal clock or external clock
VSS	I	Ground
VIN	I	Power supply
RXFROK	I	Adjust RF output frequency
XIN/XOUT	I	Connect external clock
COL[7:0]	I	Define Column of Remote controller
ROW[7:0]	I	Define ROW of Remote controller

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions
Max storage temperature	$T_{STOREmax}$	+120℃
Min storage temperature	$T_{STOREmin}$	-60℃
Power supply voltage	VIN	-0.1V to +3.6V
Electrostatic discharge	V_{ESD}	1KV

Recommend Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply voltage	VIN	2.5	3	3.6	V
Operating Temperature	T_a	-15	-	+55	℃

ELECTRICAL CHARACTERISTICS

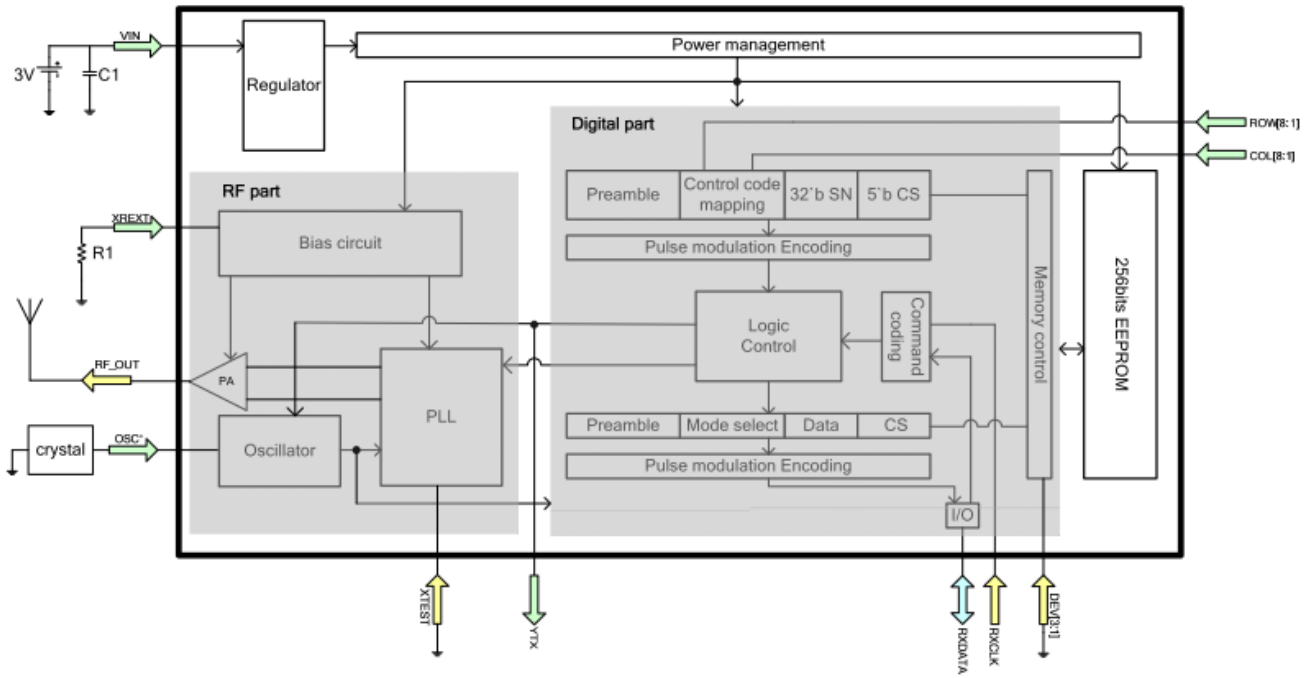
➔AC Electrical Characteristics (Ta =25℃, VIN =3V, VSS = 0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
RF Output Frequency	F_c	-	433.92	-	Mhz
RF Output Power	P_{out}	-20	-	0	dbm
RF Transmission setup time	T_{RF_OUT}	-	-	30	ms
RF Frequency error	F_{error}	-	-	1000	ppm
Interrogator Transmit Spurious Emissions, In-Band	In accordance with local regulations				-
Interrogator Transmit Spurious Emissions, Out of-Band	In accordance with local regulations				-
RF Bandwidth	In accordance with local regulations				-
Transmit data rate	DR_{ate}	-	1: 8K 0: 4K	-	bps
Modulation	ASK				
Modulation Type	PULSE MODULATION				

➔DC Electrical Characteristics (VIN =2.5V to 3.6V, VSS= 0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Average operating current	I_{OC}	-	1	-	mA
Standby current	I_{SB}	-	1	-	uA
Peak current	I_{peak}	10	-		mA
input low voltage	V_{IL}	-0.1	-	0.3	V
input high voltage	V_{IH}	1.6	-	2	V
digital output low voltage	V_{OL}	-	-	0.3	V
digital output high voltage	V_{OH}	1.6	-	-	V

Function block diagram



Function description

The ECF300 consists of an power block, digital block and RF block. The power block can be used to support working voltage to the digital and transmitter block. The digital block is to provide a control code and series number to the RF block. The RF block is used to be the carrier generator with command signal which is come from digital part. And it can be adjusted the output power by using different RES(R1) value. The output power is raised if the Res become smaller. There are two operation modes in the ECF300. One is Transmitting mode and the other is Writing mode. The function of transmitting mode is to transmit control code and series number to the device. There are 256 different kinds of control code, included of double key and over 40 billion kinds of series number. The device will work when the series number is matching between the device and remote controller. The process of Transmitting mode is as following:

When user pulls the button then:

1. Access SN data from memory.
2. Creating command form: leading zero + preamble +data +SN +Check sum.
3. Encoding PWM form.
4. Transmit the command by transmitter.

The process of writing SN mode process is as following:

1. RXCLK = 8KHz then the mode is changed to Writing SN mode from Transmitter mode

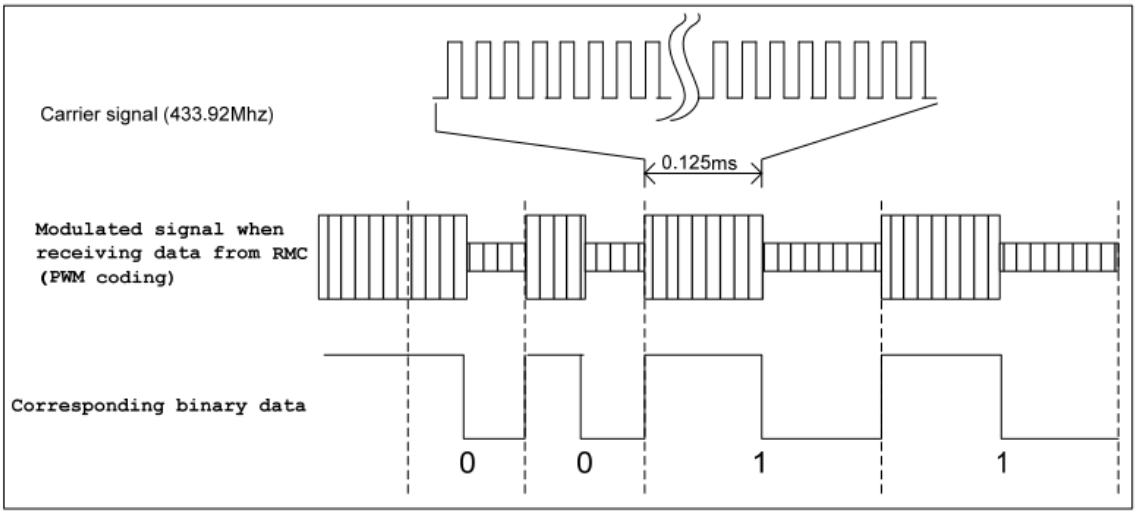
2.After 32 clock cycle, send the Write_SN command by the pin of Data_in to write SN data to memory.

3. Checking response signal by the pin of Data_in.

TIMING CHARACTERISTICS

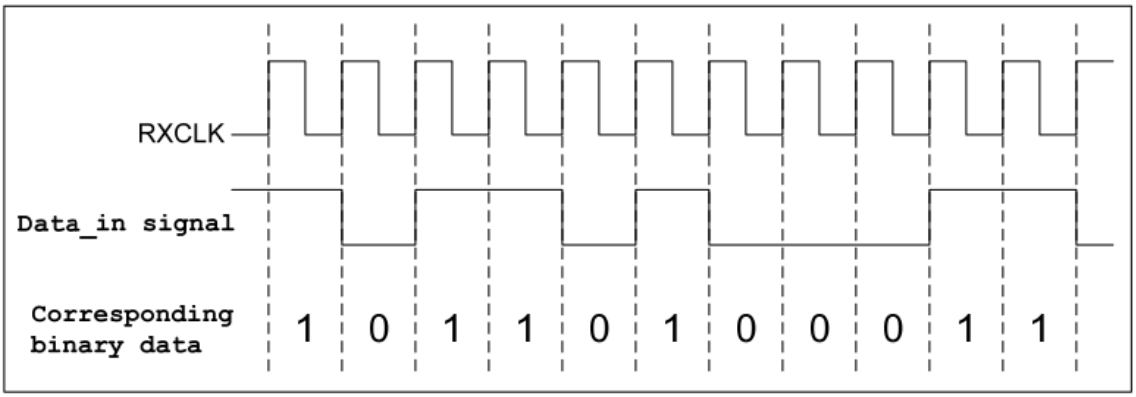
->DECODING OF THE TRANSFER STREAM

According to PWM coding the information read out from the tag is modulated as follows:



->DECODING OF THE WRITE MODE STREAM

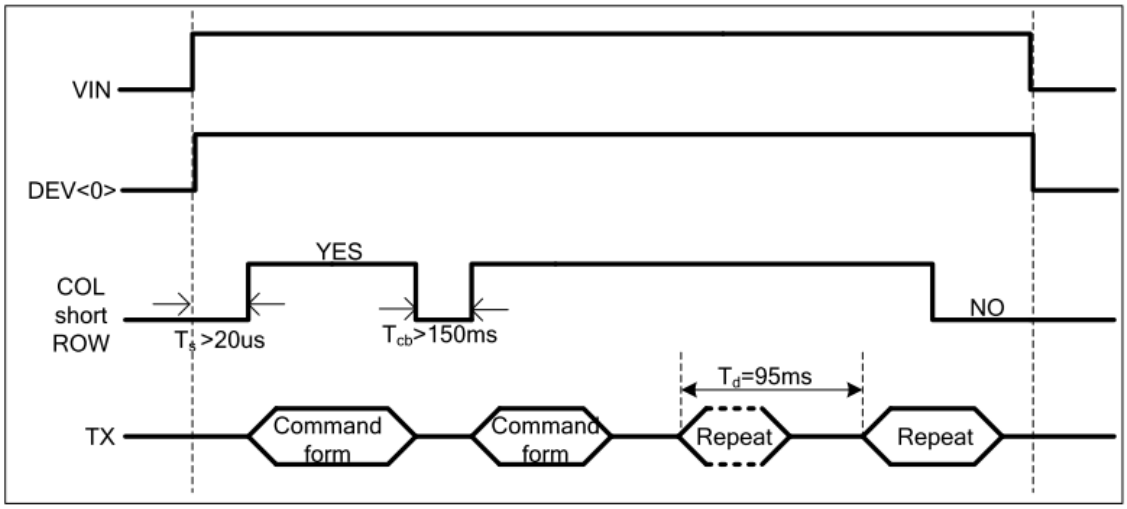
The write mode of coding information is as follows:



DATA TRANSFER PROTOCOL

->Transmitting mode:

Transfer protocol is described below



WRITE MODE PROTOCOL

->SN write mode:

The “SN write” command form and the response form are described as follows and The Checksum helps to check the correctness of the transmission packet. The algorithm of Checksum is each bit added beside the “Preamble”.:

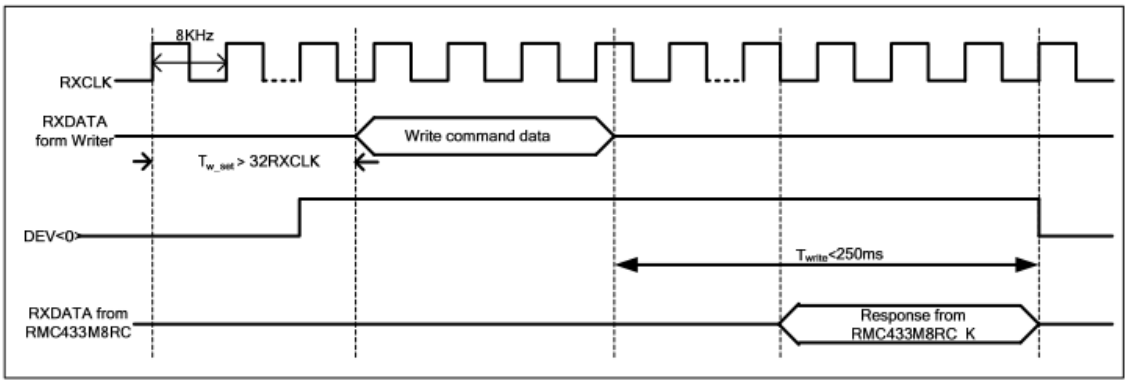
Command form:

Preamble (010110)	Test mode “00”	Data 32bits	Check sum 6bits

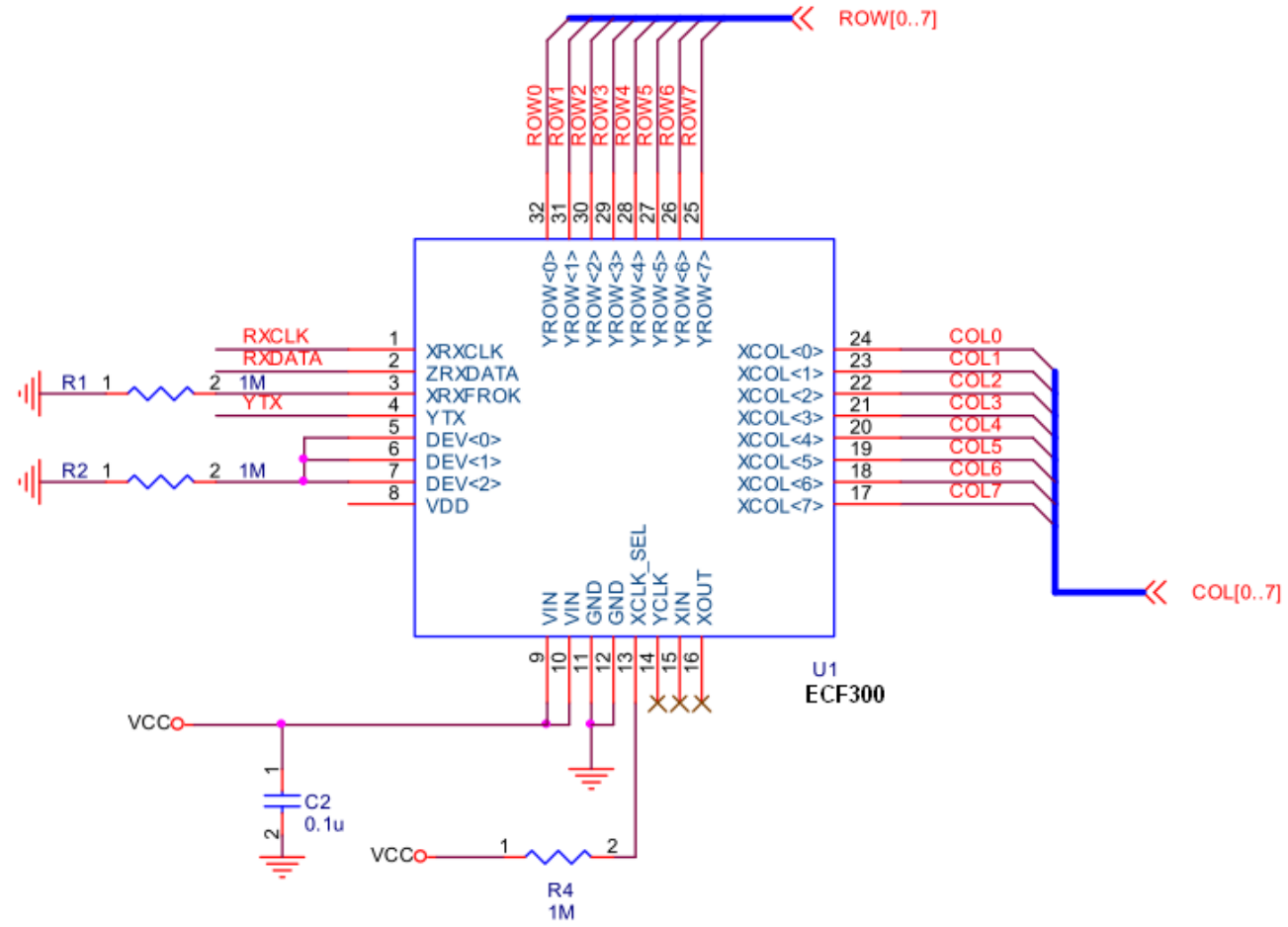
Response form:

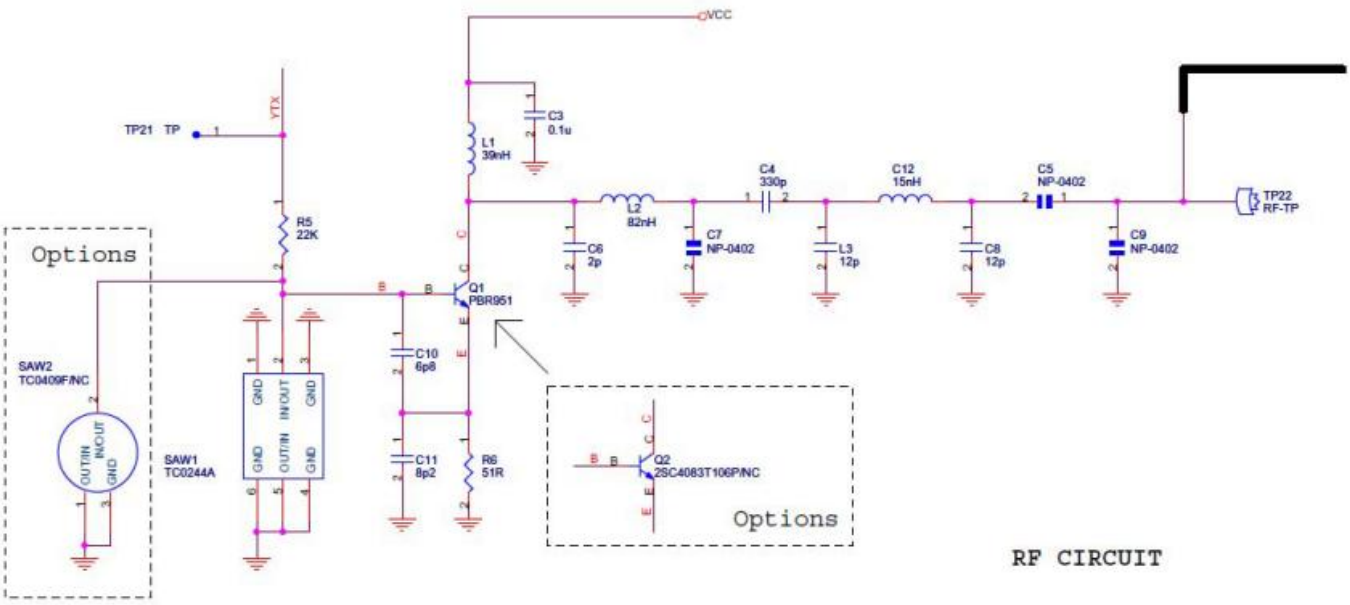
Preamble (010110)	Data 32bits	Check sum 6bits

Transfer protocol is described below



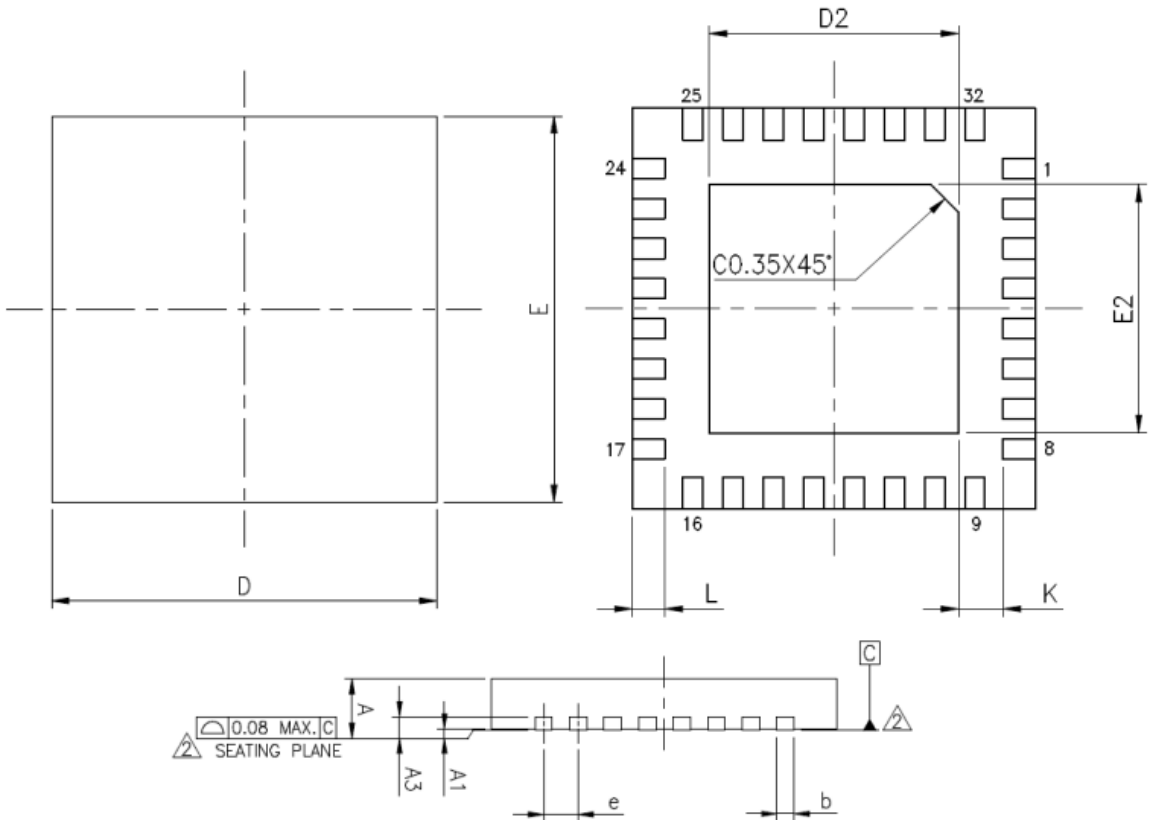
Application Schematic





Mechanical Characteristics

QFN 32 package information



SYMBOLS	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
⚠1 A3		0.203 REF.	
b	0.18	0.25	0.30
D	4.90	5.00	5.10
E	4.90	5.00	5.10
e		0.50 BSC.	
L	0.35	0.40	0.45
K	0.20	—	—

UNIT : mm

	D2			E2		
EXPOSED PAD	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
2.7X2.7	2.60	2.70	2.80	2.60	2.70	2.80
3.2X3.2	3.10	3.20	3.30	3.10	3.20	3.30

UNIT : mm

Chip on Board Information

1.PAD SIZE:75um*75um

2.PAD PITCH:94um

3. DIE SIZE: 1.12mm*0.94mm

