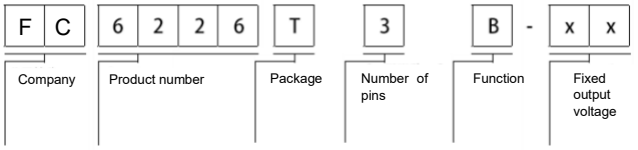
5.5V 300mA Low Dropout Linear Regulator

■ Description

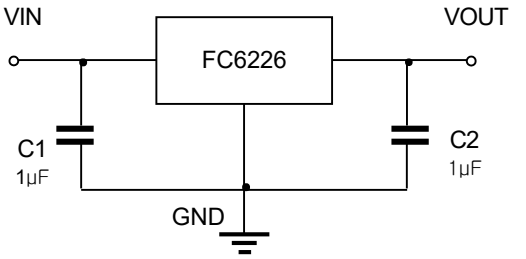
FC6226 is a high ripple rejection, low power consumption, low dropout CMOS voltage regulator with short circuit protection. Its quiescent current at no-load is as low as 0.5uA, and it can provide 300mA output current under the condition that the input and output voltage difference is extremely small, and still maintain a good regulation rate, which is very suitable for portable battery-powered products, voice and imaging equipment products.

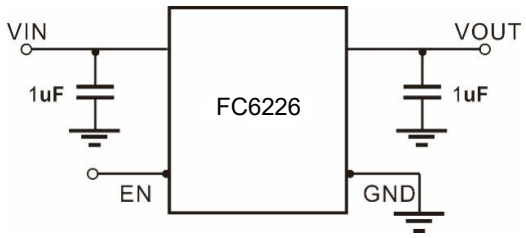
FC6226 retains all common features of low dropout regulators, including low dropout PMOS pass devices, short circuit protection and thermal shutdown.

■ Naming convention



■ Typical Application Circuit





■ Features

- ±2% output voltage tolerance over temperature
- V_{IN} range up to 5.5V
- Ultra-low quiescent current 0.5uA
- Dropout voltage typically 500mV at I_{OUT} = 300mA
- Built-in Thermal Protection
- Built-in Overcurrent Protection

■ Application

- Portable battery powered devices (wearable watches, body fat scales, etc.)
- Security (cameras, dash cams, etc.)
- Mobile terminals (POS machines, power banks, etc.)
- Smart meters (electricity, gas, etc.)
- Sensors

■ Package (RoHS Compliant)

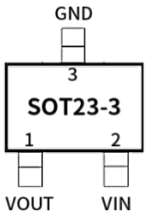
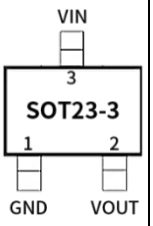
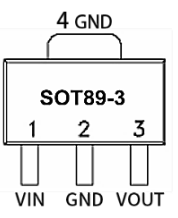
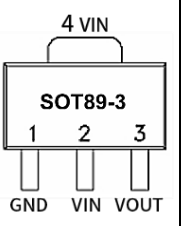
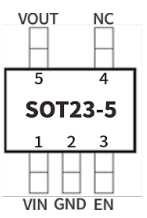
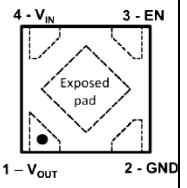
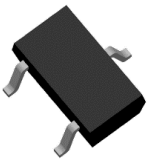
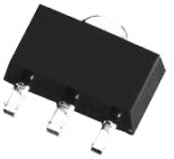
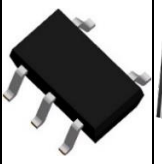
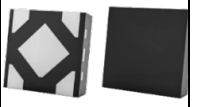
- SOT23-3
- SOT23-5
- SOT89-3
- DFN1X1-4L

■ Ordering Information

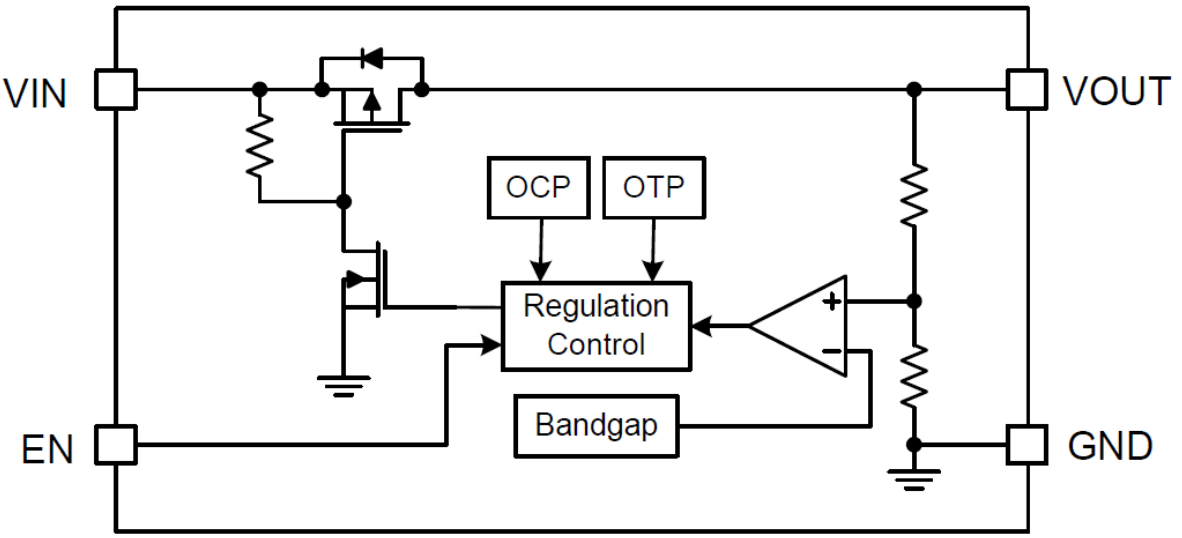
Order Code	V_{IN} (V)	V_{OUT} (V)	I_{OUT} max (mA)	I_Q (uA)	Output Precision	PSRR (dB@1KHz)	Dropout Voltage (mV)	Enable	Package
FC6226T3-XX	2.5~5.5	1.8/2.5/2.8/3.0/3.3	300	0.5	± 2%	45	150@100mA	—	SOT23-3
FC6226T3B-XX								—	SOT23-3
FC6226N3-XX								—	SOT89-3
FC6226N3B-XX								—	SOT89-3
FC6226T5-XX								√	SOT23-5
FC6226D4-XX								√	DFN1X1-4L

Note: XX represents output voltage, 1.8V/2.5V/2.8V/3.0V/3.3V optional

■ Pin Configuration

Pin Name	FC6226T3	FC6226T3B	FC6226N3	FC6226N3B	FC6226T5	FC6226D4	Pin Function
VOUT	1	2	3	3	5	1	Output Voltage Pin
GND	3	1	2、4	1	2	2	Ground
VIN	2	3	1	2、4	1	4	Input Voltage Pin
EN	—	—	—	—	3	3	Enable Pin
NC	—	—	—	—	4	—	Not Connected
Picture							
Rendering							
Package	SOT23-3		SOT89-3		SOT23-5	DFN1X1-4L	

■ Functional Block Diagram



■ Absolute Maximum Ratings

Project	Symbol	Value		Units
Input Voltage	V_{IN}	-0.3 ~ +6.5		V
Junction Temperature	T_J	125		℃
Power Dissipation	P_D	SOT23-3	0.29	W
		SOT23-5	0.29	
		SOT89-3	0.5	
		DFN1X1	0.4	
Thermal Resistance	$R_{\theta JA}$	SOT23-3	350	℃/W
		SOT23-5	350	
		SOT89-3	200	
		DFN1X1	250	
Lead Temperature (Soldering, 10 sec.)	—	300		℃
Storage Temperature	Tstg	-65 ~ +150		℃

(1) Absolute maximum ratings indicate that exceeding these ratings may cause damage to the component. The operating rating is the specified operating conditions of the device.Running the rated value does not imply a validated performance limit. For performance limits and related testing conditions, please refer to the electrical characteristics table.

(2) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

(3) $R_{\theta JA}$ is measured at T_A = 25℃ on a high effective thermal conductivity four-layer test board per JEDEC 51-7.

■ Recommended Operating Conditions

Project	Symbol	Value	Units
Input Voltage	V_{IN}	2.5 ~ 5.5	V
Operating Temperature	T_A	-40 ~ +85	℃
Junction Temperature	T_J	-40 ~ +125	℃

■ Electrical Characteristics

V_{IN}= V_{OUT} +1V, I_{OUT}=1mA, C_{IN}=C_{OUT}=1uF, T_J=25℃, unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_{OUT}	Output Voltage Accuracy		-2%		2%	V
$\triangle V_{LINE}$	Line Regulation	V_{IN} = V_{OUT} + 1V ~5.5V		20	50	mV
$\triangle V_{LOAD}$	Load Regulation	I_{OUT} = 1mA ~300mA		1.5		%
V_{DROP}	Dropout Voltage	I_{OUT} = 100mA, V_{OUT} = 3.3V		150		mV

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_{DROP}	Dropout Voltage	I_{OUT} = 300mA, V_{OUT} = 3.3V		500		
		I_{OUT} = 100mA, V_{OUT} =1.8V		180		
		I_{OUT} = 300mA, V_{OUT} =1.8V		600		
I_Q	Quiescent Current			0.5	1	uA
I_{CL}	Current Limit		360	560		mA
V_{ENHI}	Enable High Level		0.6			V
V_{ENLO}	Enable Low Level				0.2	V
PSRR	Power-supply Rejection Ratio	f=1KHz		45		dB
T_{SD}	Thermal Shutdown			150		℃
T_{SDHY}	Thermal Shutdown Hysteresis			20		℃

■ Typical Characteristics

V_{IN}= V_{OUT} +1V, I_{OUT}=1mA, V_{OUT}=3.3V, C_{IN}=C_{OUT}=1uF, T_J=25℃, unless otherwise specified

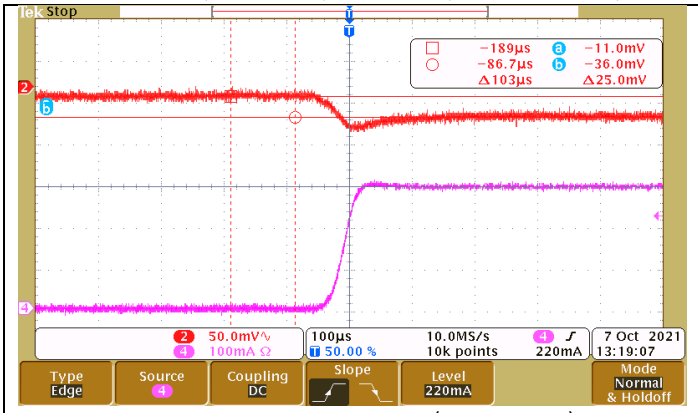


Fig 1. Load Transient （1mA~300mA）

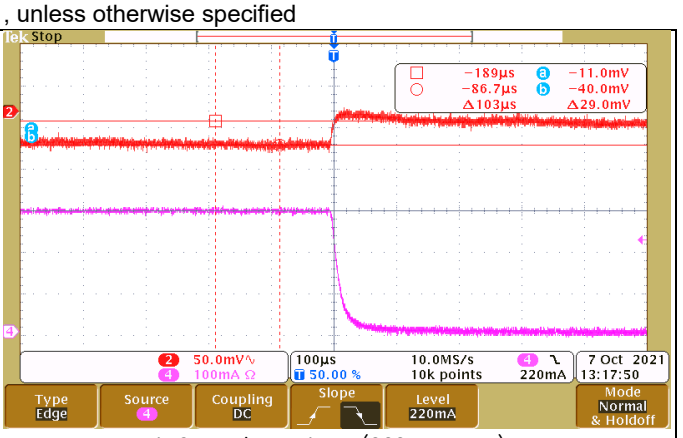


Fig 2. Load Transient （300mA~1mA）

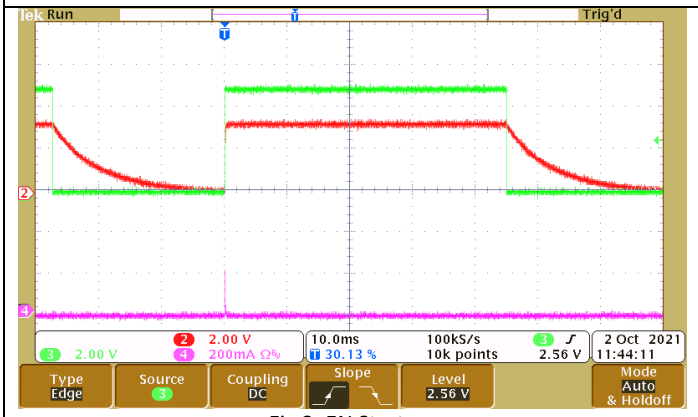


Fig 3. EN Start up

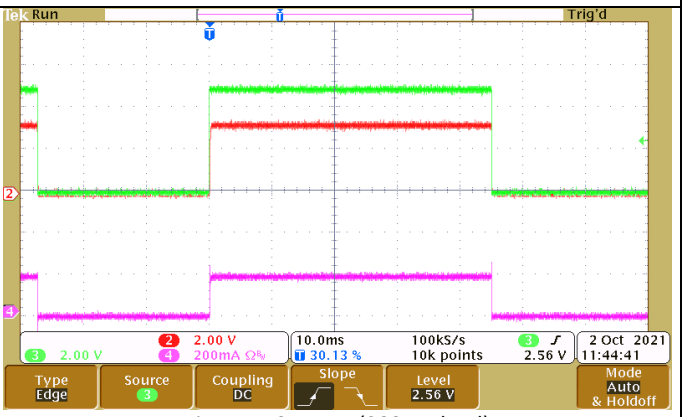


Fig 4. EN Start up (200mA load)

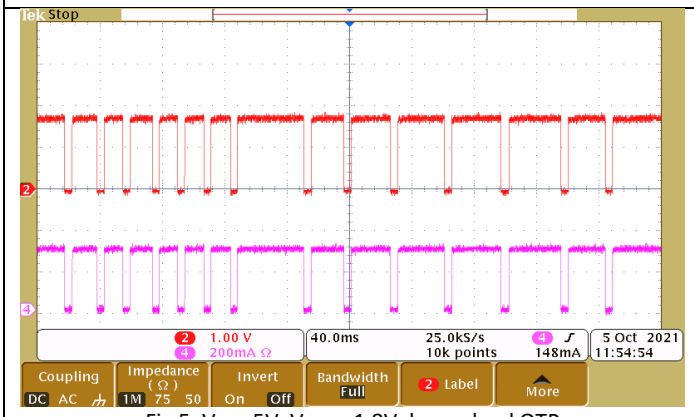


Fig 5. V_{IN} = 5V, V_{OUT} = 1.8V, heavy load OTP

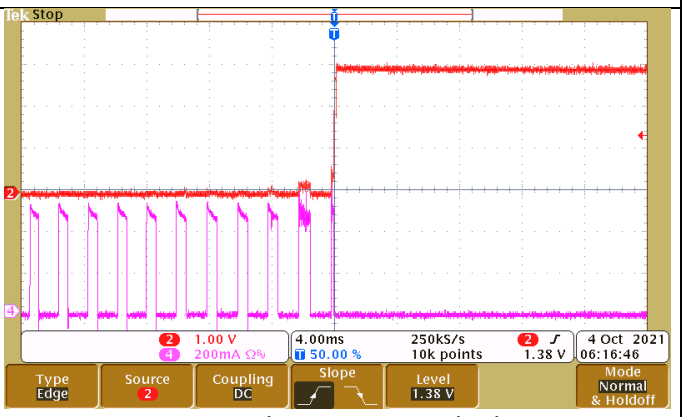


Fig 6. VOUT short to GND and release

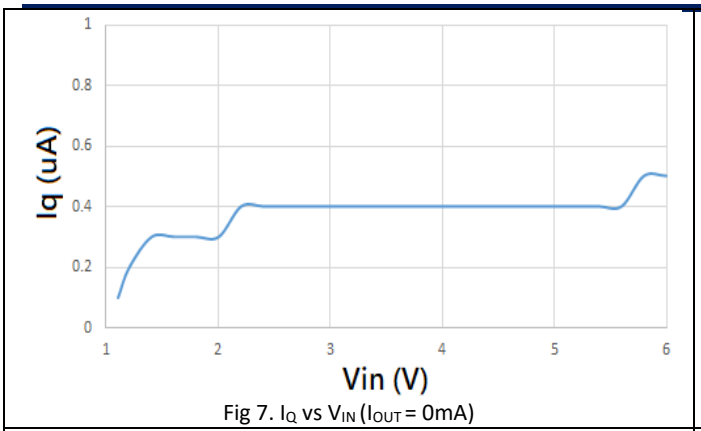


Fig 7. I_Q vs V_{IN} (I_{OUT} = 0mA)

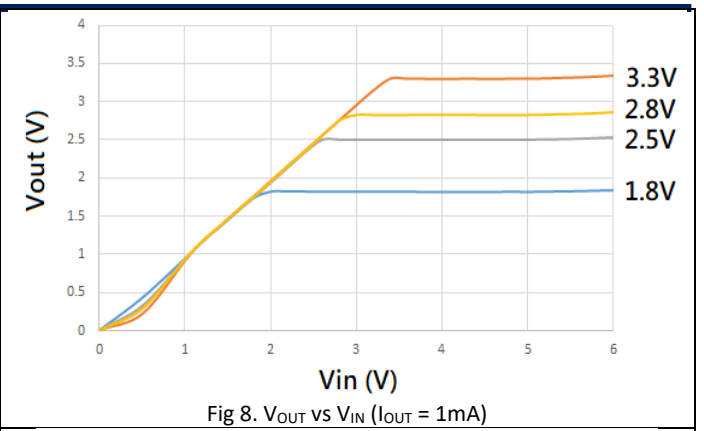


Fig 8. V_{OUT} vs V_{IN} (I_{OUT} = 1mA)

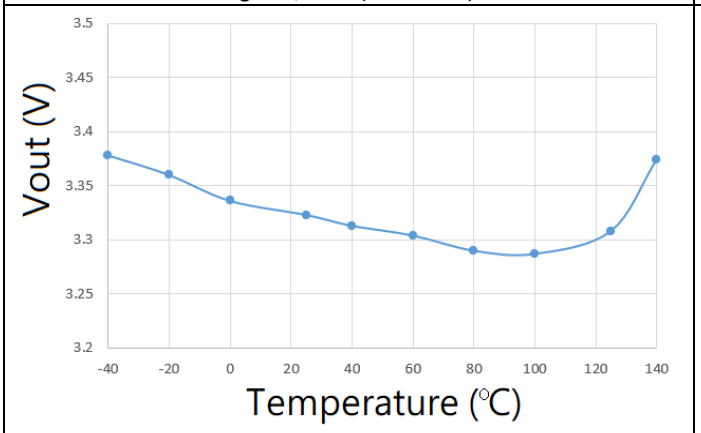


Fig 11. V_{OUT} vs Temperature (I_{OUT} = 1mA)

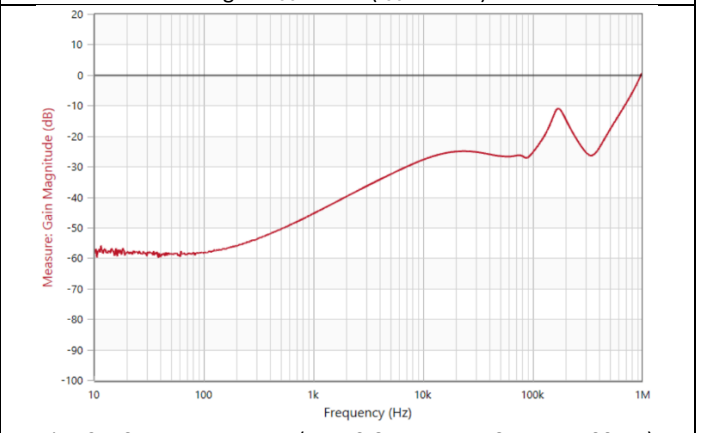


Fig 12. PSRR vs Frequency (V_{IN} = 3.8V, V_{OUT} = 1.8V, I_{OUT}=100mA)

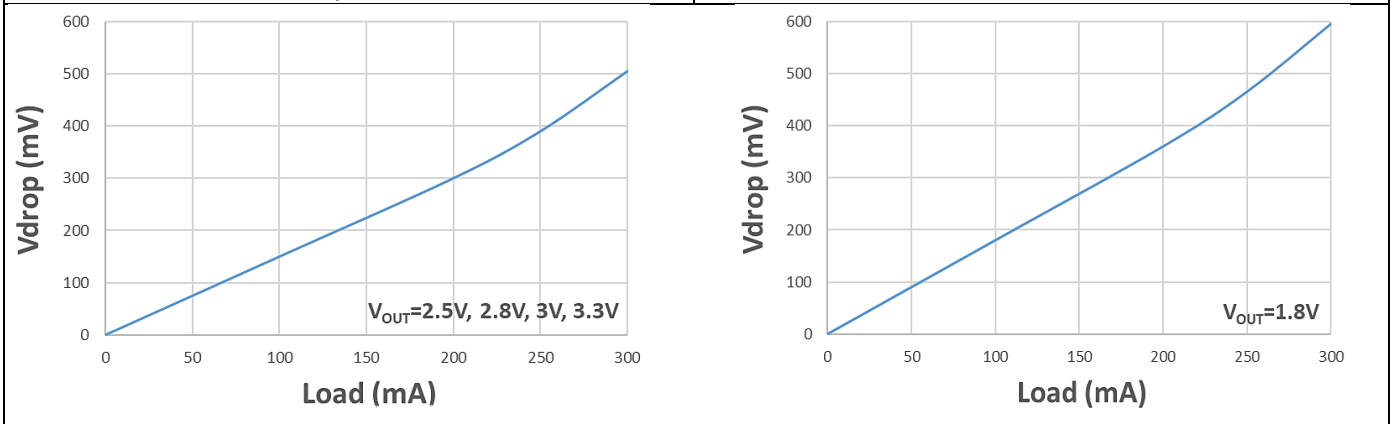


Fig 11. V_{DROP} vs Load

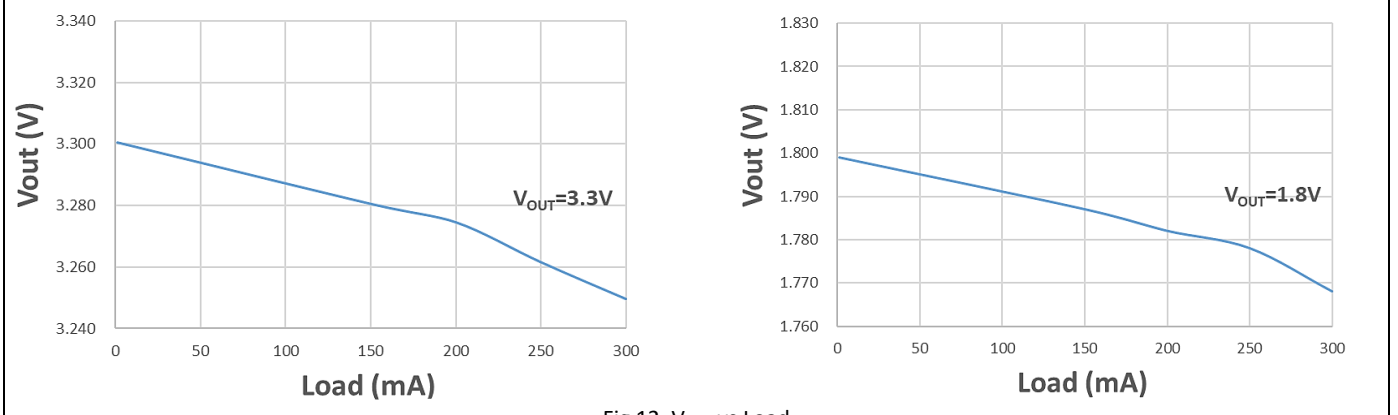
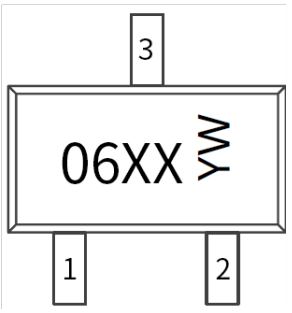
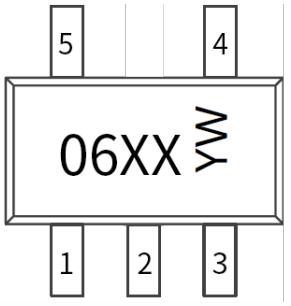


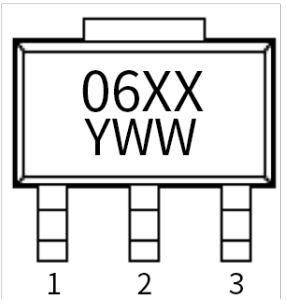
Fig 12. V_{OUT} vs Load

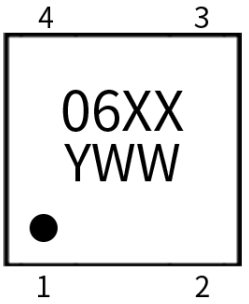
■Silkscreen Instructions



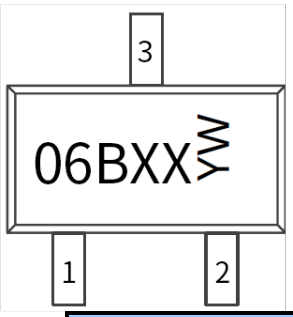


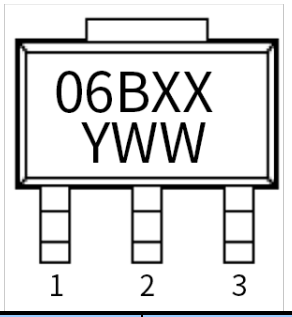
XXXX YW
Y: Year (4=2024)
W: Week (A-Z: 1-26Week)
(a-z : 27-52Week)
The first 2 XX: product series
3rd X: Functional distinction
The last 2 XX: output voltage





XXXX YWW
Y: Year (1=2021)
WW: Week (01~52Week)
The first 2 XX: product series
3rd X: Functional distinction
The last 2 XX: output voltage





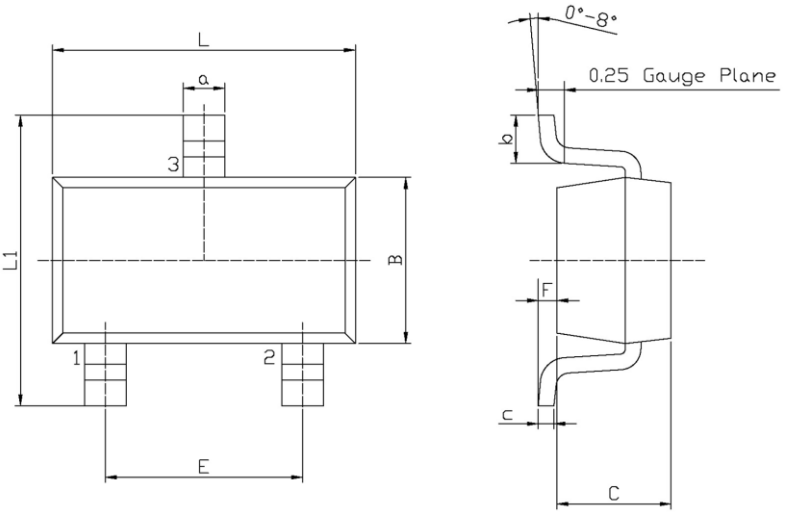
XXXXX YW
Y: Year (1=2021)
W: Week (A-Z: 1-26Week)
(a-z : 27-52Week)
The first 2 XX: product series
3rd X: Functional distinction
The last 2 XX: output voltage (18/25/33)

Chip model	Package	Chip Screen Printing	Character Description
FC6226T3-18	SOT23-3	06XX	XX:Corresponds to output voltage (1.8V/2.5V/ 2.8V/3.0V/3.3V))
FC6226T3-25			
FC6226T3-33			
FC6226N3-18	SOT89-3		
FC6226N3-25			
FC6226N3-33			
FC6226T5-18	SOT23-5		
FC6226T5-25			
FC6226T5-28			
FC6226T5-30			
FC6226T5-33			
FC6226D4-18	DFN1X1-4L		
FC6226D4-25			
FC6226D4-33			
FC6226T3B-18	SOT23-3	06BXX	
FC6226T3B-25			
FC6226T3B-30			
FC6226T3B-33			
FC6226N3B-18	SOT89-3		
FC6226N3B-25			
FC6226N3B-33			

■ Package Size

Unit：mm

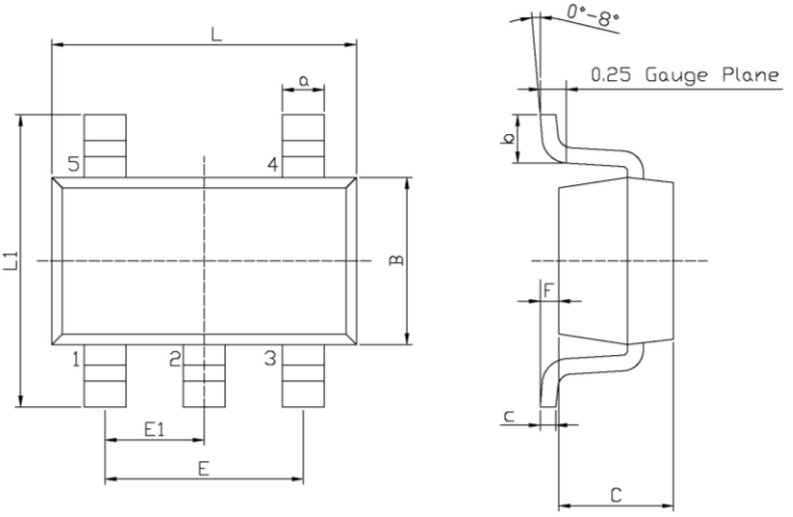
SOT23-3：



Unit: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.82	3.02	a	0.35	0.50
B	1.50	1.70	c	0.10	0.20
C	0.90	1.30	b	0.35	0.55
L1	2.60	3.00	F	0	0.15
E	1.80	2.00			

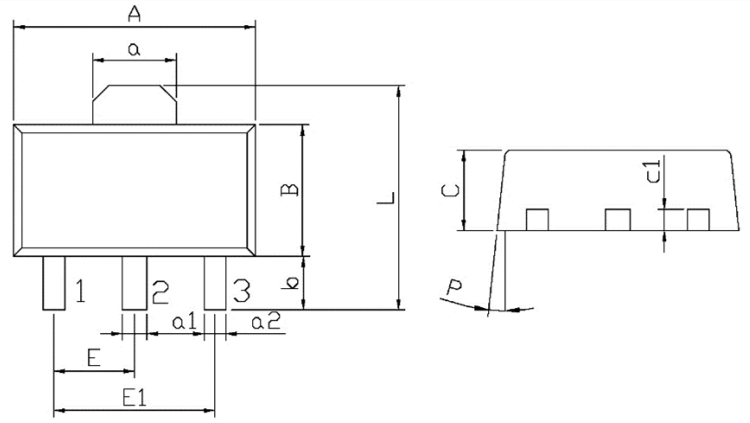
SOT23-5：



Unit: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.82	3.02	E1	0.85	1.05
B	1.50	1.70	a	0.35	0.50
C	0.90	1.30	c	0.10	0.20
L1	2.60	3.00	b	0.35	0.55
E	1.80	2.00	F	0	0.15

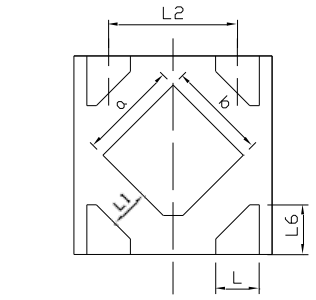
SOT89-3：

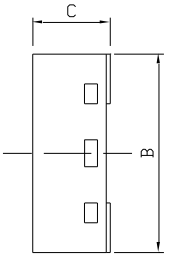


Symbol	Dimensions In Millmeters		Symbol	Dimensions In Millmeters	
	Min	Max		Min	Max
A	4.4	4.7	a1	0.36	0.56
B	2.35	2.65	a2	0.30	0.50
L	3.878	4.478	C	1.40	1.70
a	1.45	1.65	c1	0.35	0.50
E	1.40	1.60	P	6°	
E1	2.80	3.20			
b	0.80	1.20			

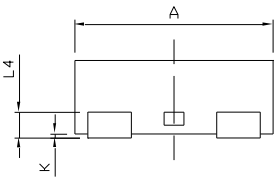
DFN1X1-4L：

Unit : mm





Dimensions In Millimeterer			
Symbol	MIN	TYP	MAX
A	0.95	1.00	1.05
B	0.95	1.00	1.05
C	0.34	0.37	0.40
L	0.17	0.22	0.27
L1	0.15	-	-
L2	-	0.65	-
L4	-	0.10	-
L6	0.20	0.25	0.30
K	0.00	0.02	0.05
a	0.43	0.48	0.53
b	0.43	0.48	0.53



■ Packaging Quantity

Package	Reel	Reel Size	G.W.
SOT89-3	1000 pcs	7 inch	0.14 kg
SOT23-3	3000 pcs	7 inch	0.12 kg
SOT23-5	3000 pcs	7 inch	0.13 kg
DFN1X1-4L	10,000 pcs	7 inch	0.13 kg