SK6018

300mA Low Consumption, Low Dropout CMOS LDO

GENERAL DESCRIPTION

The SK6018 series are low dropout linear regulators and optimized to provide a high-performance solution for battery power system to delivery low quiescent current. The device offers a new level of cost-effective performance in cellular phones, laptop and notebook computers, and other portable devices.

SK6018 can provide output value in the range of 1.2V~3.6V by every 0.1V step.

The SK6018 series are designed to make use of low-cost ceramic capacitors which ensure the stability of the output current, and enhance the efficiency in order to prolong the battery life of those portable devices.

The SK6018 is available in DFN1x1-4L and TDFN1x1-4L packages. Standard products are Pb-free and Halogen-free.

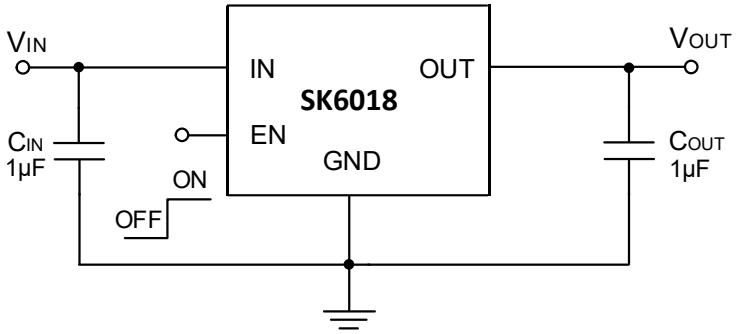
FEATURES

- Input Voltage : 2.5V~6.5V
- Output Range: 1.2V~3.6V (customized by every 0.1V step)
- Output Current: 300mA@V_{IN}-V_{OUT}=0.5V
- Dropout Voltage: 100mV@I_{OUT}=100mA
- Quiescent Current : 1μA Typ.
- Recommend Capacitor: 1μF
- Optional Output Discharge Function

APPLICATIONS

- Reference voltage source
- Toys
- Bluetooth, wireless handsets
- Low Consumption Device
- Others portable electronic device

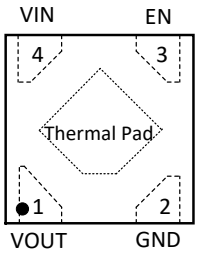
TYPICAL APPLICATION CIRCUIT



PIN CONFIGURATION

DFN1x1-4L

TOP VIEW



DFN1x1-4L

PIN DESCRIPTION

PIN NO	SYMBOL	I/O	DESCRIPTTION
1	VOUT	O	Output
2	GND	GND	Ground
3	EN	I	Enable (Active high, do not float)
4	VIN	Power	Input
Thermal Pad	-	/	Thermal pad, connect to GND

ORDER INFORMATION

PART NO	Vout Discharge	ACCURACY	PACKAGE	TEMPERATURE	TAPE & REEL
SK6018D4-XX	N	2%	DFN1x1-4L	-40 ~ +85℃	10000/REEL
SK6018AD4-XX	Y	2%	DFN1x1-4L	-40 ~ +85℃	10000/REEL
SK6018TD4-XX	N	2%	TDFN1x1-4L	-40 ~ +85℃	10000/REEL
SK6018ATD4-XX	Y	2%	TDFN1x1-4L	-40 ~ +85℃	10000/REEL

Note: *XX indicates 1.2V~3.6V by 0.1V step. For example, 33 means product outputs 3.3V.*

PART NUMBER RULES

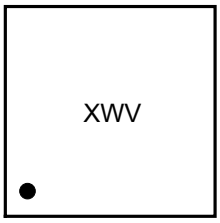
SK6018 [1] [2] - [3]

Output Voltage :
XX: 1.2V~3.6V by 0.1V step, Example: 28 - 2.8V

Package:
D4: DFN1x1-4L; TD4: TDFN1x1-4L

V_{OUT} discharge:
A -Yes
Blank-No

MARKING DESCRIPTION:



"**X**": Product code, here "U" stands for "SK6018", and "T" stands for "SK6018A"

"**W**": The week of manufacturing. "A" stands for week 1,"Z" stands for week 26, "a" stands for week 27, "z" stands for week 52.

"**V**": Output voltage code.

TYPICAL OUTPUT VOLTAGE CODE TABLE

V_{OUT}	CODE	V_{OUT}	CODE
1.2V	B	1.5V	C
1.8V	D	2.5V	E
2.8V	M	3.0V	G
3.3V	H	3.6V	I

ABSOLUTE MAXIMUM RATINGS (Note)

SYMBOL	ITEMS	VALUE	UNIT
V_{IN}	Input Voltage	-0.3~8	V
I_{OUT}	Output Current	350	mA
P_{DMAX}	Power Dissipation	0.6	W
$R_{\theta JA}$	Thermal Resistance	250	℃/W
T_J	Junction Temperature	-40~+125	℃
T_A	Ambient Temperature	-40~+85	℃
T_{STG}	Storage Temperature	-55~+150	℃
T_{SOLDER}	Package Lead Soldering Temperature (10s)	260	℃
ESD	HBM	±8	KV

Note: *Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.*

$P_{DMAX} = (V_{IN} - V_{OUT}) * I_{OUTMAX}$

RECOMMENDED OPERATING RANGE

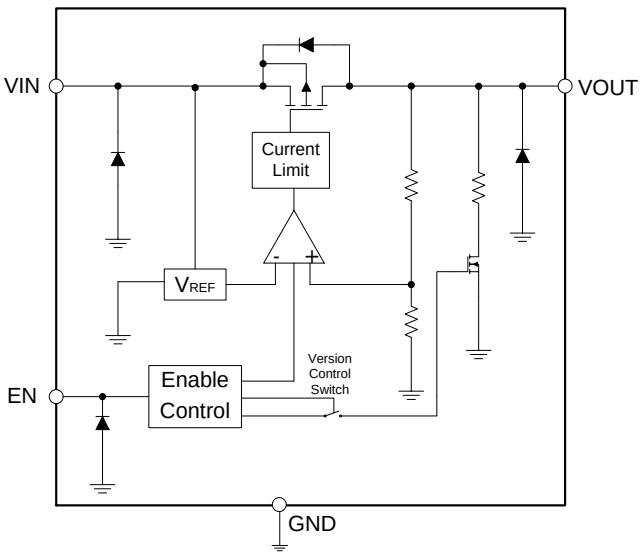
SYMBOL	ITEMS	VALUE	UNIT
V_{IN}	Supply Voltage	2.5 to 6.5	V
T_{OPT}	Operating Temperature	-40 to +85	℃

ELECTRICAL CHARACTERISTICS

The following specifications apply for V_{OUT}=3.3V, T_A=25℃, unless otherwise noted.

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Voltage		2.5		6.5	V
V_{OUT}	Output Voltage	I_{OUT}=1mA	-2		2	%
I_Q	Quiescent Current	V_{OUT}=3.3V, I_{OUT}=0		1	2	μA
I_{LIMIT}	Current Limit	V_{IN}-V_{OUT}=0.5V		350		mA
V_{DROP}	Dropout Voltage	V_{OUT}=3.3V, I_{OUT}=100mA		110		mV
		V_{OUT}=3.3V, I_{OUT}=200mA		230		
ΔV_{LINE}	Line Regulation	V_{IN}=2.7~5.5V, I_{OUT}=1mA		0.01	0.15	%/V
ΔV_{LOAD}	Load Regulation	V_{OUT}=3.3V, V_{IN}=4.3V, I_{OUT}=1~300mA V_{OUT}=1.8V, V_{IN}=2.8V, I_{OUT}=1~250mA			36	mV
I_{SHORT}	Short Current	V_{EN}=V_{IN}, V_{OUT} Short to GND with 1Ω		90		mA
I_{SHDN}	Shut-down Current	V_{EN}=0V		0.1	1	μA
V_{ENH}	EN Logic High Voltage	V_{IN}=5.5V, I_{OUT}=1mA	1.2		V_{IN}	V
V_{ENL}	EN Logic Low Voltage	V_{IN}=5.5V, V_{OUT}=0V			0.4	V
I_{EN}	EN Input Current	V_{EN}= 0 to 5.5V			1.0	μA
R_{DIS}	Output Discharge Resistance (A versions only)	V_{IN}=5.0V, V_{EN}= 0V		500		ß
PSRR	Power Supply Ripple Rejection	V_{IN}=5V+0.5Vp-p, F=100Hz ,I_{OUT}=100mA		45		dB
		V_{IN}=5V+0.5Vp-p, F=500KHz ,I_{OUT}=100mA		35		dB
e_{NO}	Output Noise Voltage	V_{IN}=5V , 10Hz to 100KHz, C_{OUT}=1μF I_{OUT}=10mA		165		uV_{RMS}

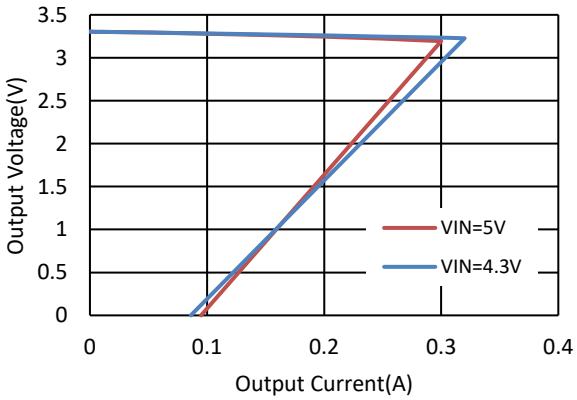
SIMPLIFIED BLOCK DIAGRAM



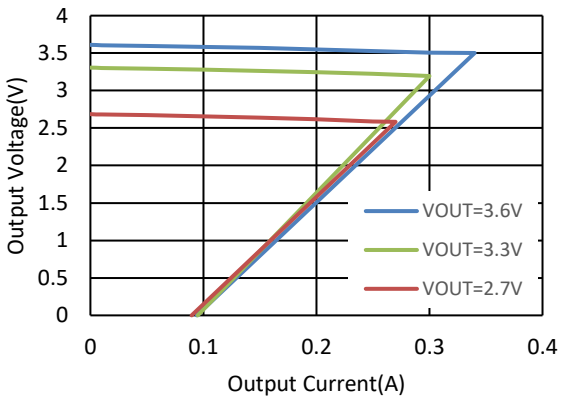
TYPICAL PERFORMANCE CHARACTERISTICS

C_{IN}=1μF, C_{OUT}=1μF, T_{OPT}=25℃, V_{IN}=5V, V_{OUT}=3.3V, unless otherwise

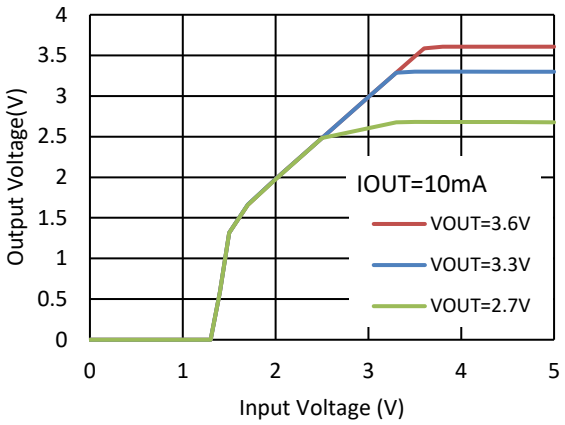
Output Voltage vs. Output Current



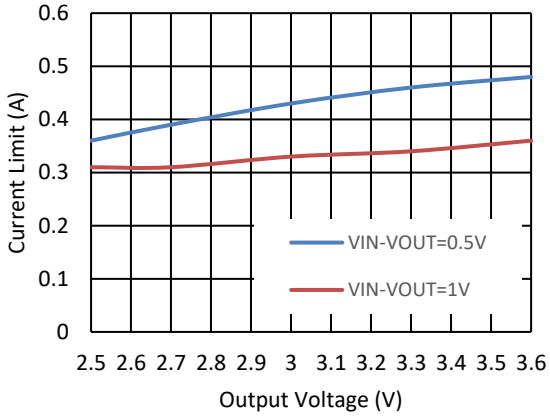
Output Voltage vs. Output Current



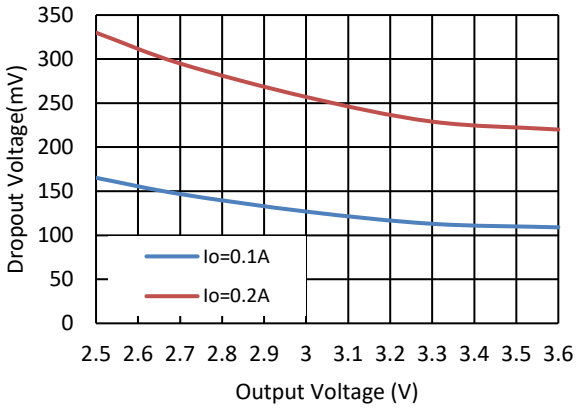
Output Voltage vs. Input Voltage



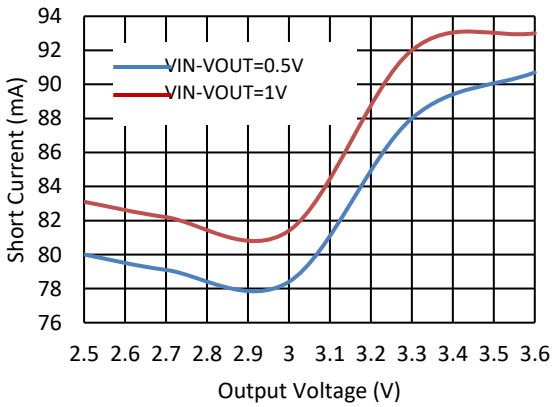
Current Limit vs. Output Voltage



Dropout Voltage vs. Output Voltage

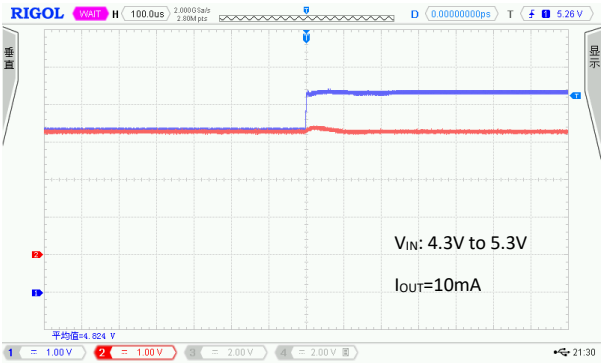


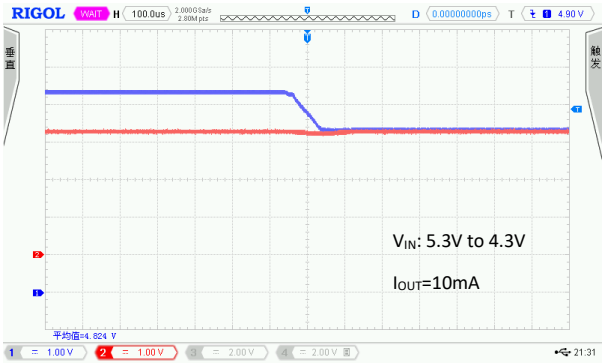
Short Current vs. Output Voltage

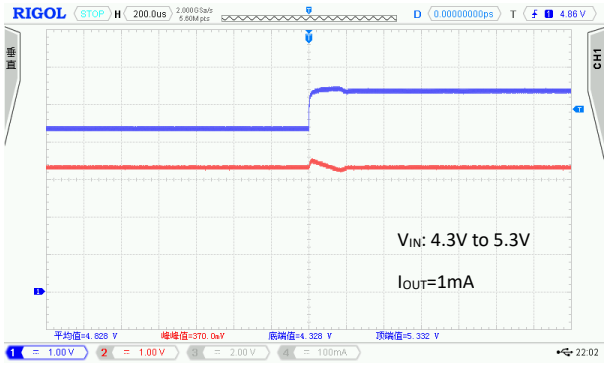


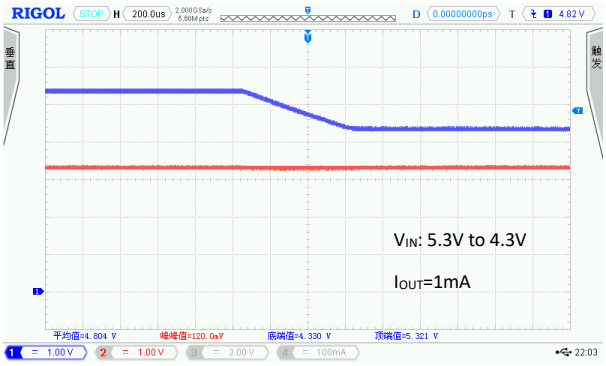
Line Transient Response

CH1: V_{IN} CH2: V_{OUT}



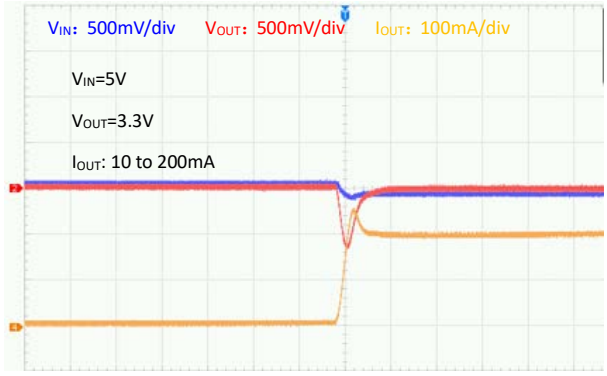


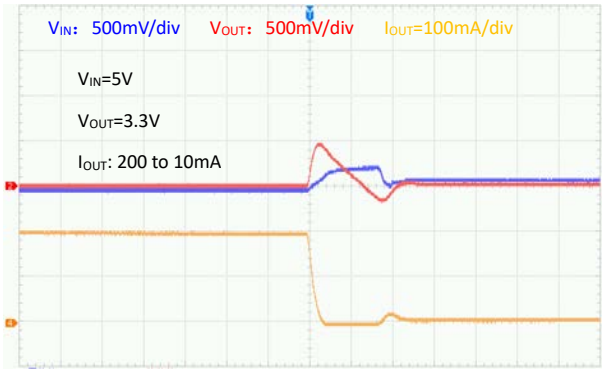


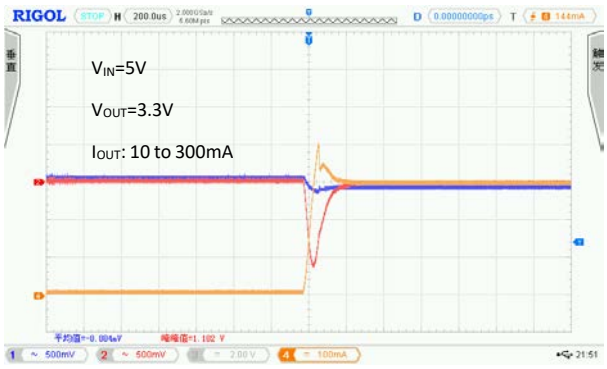


Load Transient Response

CH1: V_{IN} CH2: V_{OUT} CH3: I_{OUT}



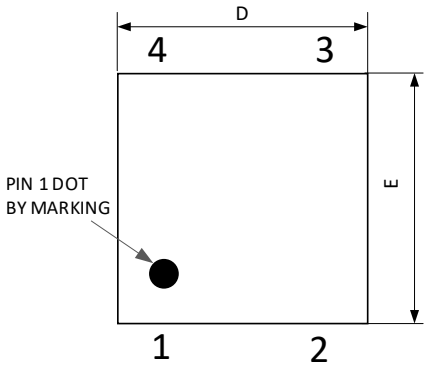




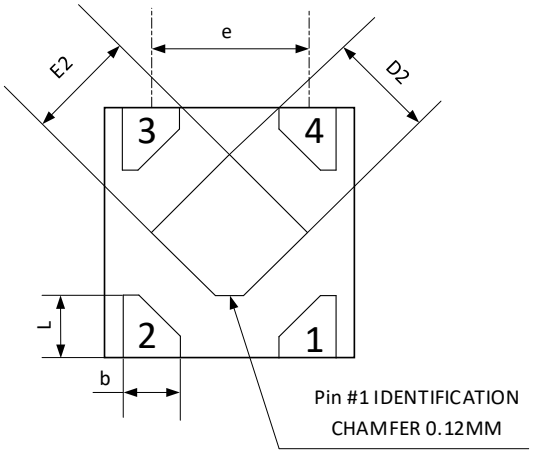
Load Transient Response (Continued)

CH1: V_{IN} CH2: V_{OUT} CH3: I_{OUT}

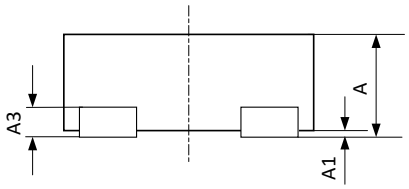
PACKAGE DIMENSIONS: DFN1X1-4L #1



TOP VIEW



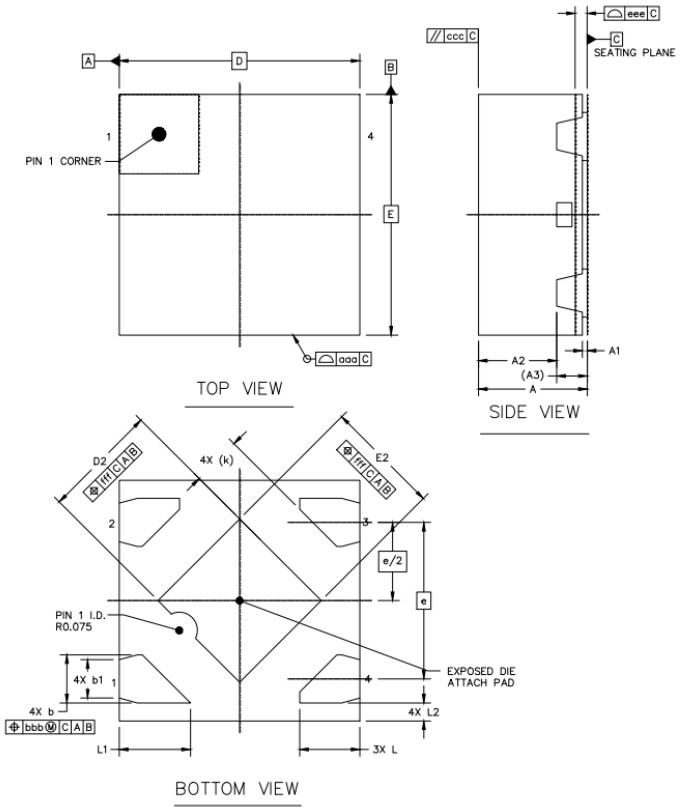
BOTTOM VIEW



SIDE VIEW

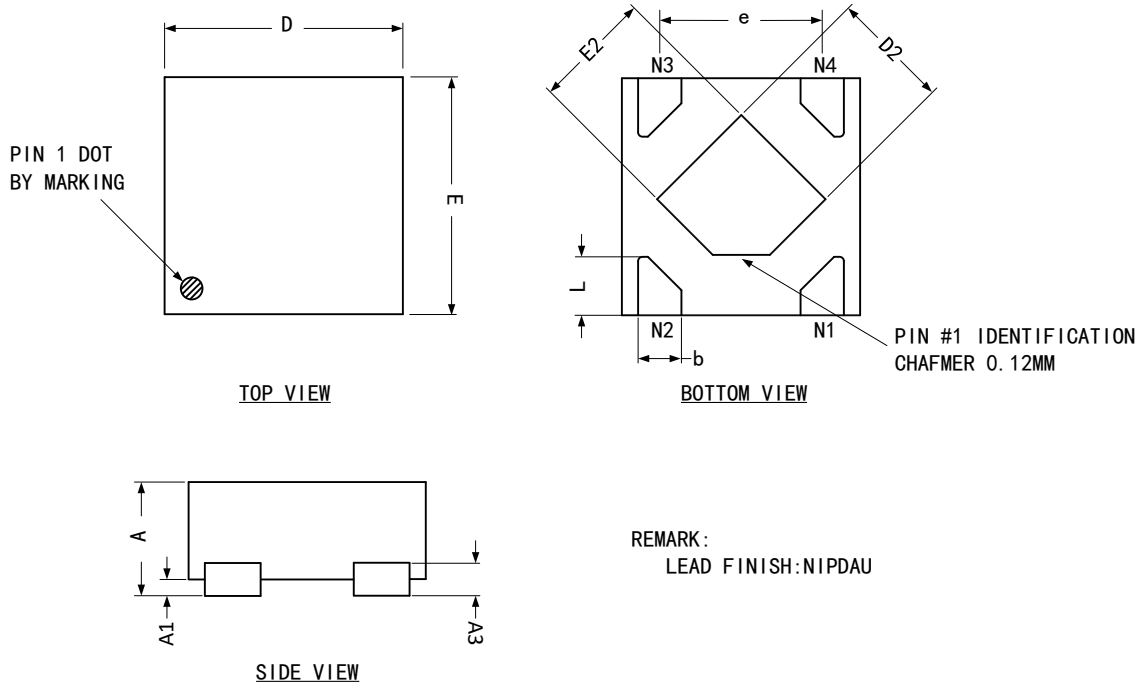
DIMENSIONS IN MILLIMETERS			
Symbol	**Min.**	**Nom.**	**Max.**
A	0.40	-	0.50
A1	0.00	-	0.05
A3		0.125REF.	
D	0.95	1.00	1.05
E	0.95	1.00	1.05
b	0.15	0.20	0.25
L	0.15	0.25	0.35
D2	0.38	0.48	0.58
E2	0.38	0.48	0.58
e		0.65 BSC	

PACKAGE DIMENSIONS: DFN1X1-4L #2



DIMENSIONS IN MILLIMETERS			
Symbol	**Min.**	**Nom.**	**Max.**
A	0.40	0.45	0.50
A1	0.00	0.02	0.05
A2	-	0.325	-
A2		0.127 REF	
b	0.15	0.2	0.25
b1		0.16 REF	
D		1 BSC	
E		1 BSC	
e		0.65 BSC	
D2	0.38	0.48	0.58
E2	0.38	0.48	0.58
L	0.2	0.25	0.3
L1	0.286	0.296	0.306
L2	0.025	0.075	0.125
K		0.205 REF	

PACKAGE DIMENSIONS: TDFN1X1-4L



DIMENSIONS IN MILLIMETERS			
PKG	EXTREME THIN		
Symbol	Min.	Nom.	Max.
A	0.30	-	0.40
A1	0.00	-	0.05
A3	0.125REF.		
D	0.95	1.00	1.05
E	0.95	1.00	1.05
b	0.15	0.20	0.25
L	0.15	0.25	0.35
D2	0.38	0.48	0.58
E2	0.38	0.48	0.58
e	0.65 BSC		