

SK6019

Low Noise, High PSRR, High Speed, CMOS LDO

GENERAL DESCRIPTION

The SK6019 is a high accuracy, low noise, high speed, low dropout CMOS Linear regulator with high ripple rejection and fast discharge function. The device offers a new level of cost-effective performance in cellular phones, surveillance system, Bluetooth, wireless and other portable electronic devices.

The SK6019 can provide product selections of output value in the range of 1.2V~3.6V by every 0.1V step. SK6019 offer over temperature protection to ensure the device working in safe conditions.

The SK6019 regulators are available in standard DFN1x1-4L package.

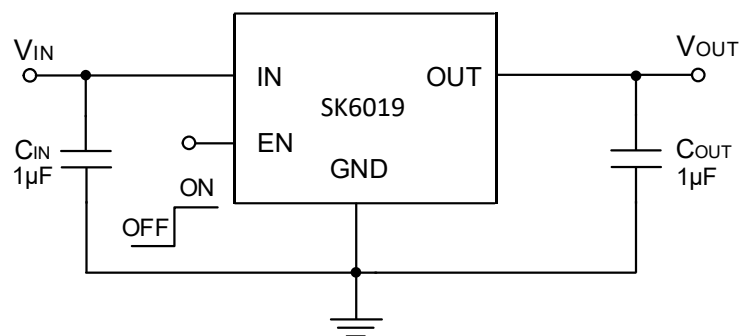
FEATURES

- Input voltage: 2.5V~6.5V
- Output range: 1.2V~3.6V (customized by every 0.1V step)
- Maximum output current: 750mA @ $V_{IN}-V_{OUT}=0.5V$
- PSRR: 75dB@1KHz, 50dB@100KHz
- Dropout voltage: 100mV@ $I_{OUT}=200mA$
- Quiescent current: 50 μA Typ.@ $V_{IN}=5V$
- Shut-down current: < 1 μA
- Recommend input capacitor: 1 μF
- Ultra-low output noise: 25 μV_{RMS}

APPLICATIONS

- Digital cameras
- Cellphones
- Bluetooth and wireless handsets
- Other portable electronic devices

TYPICAL APPLICATION CIRCUIT

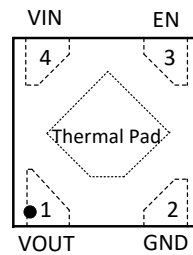


PIN CONFIGURATION



DFN1x1-4L

TOP VIEW



DFN1x1-4L

PIN DESCRIPTION

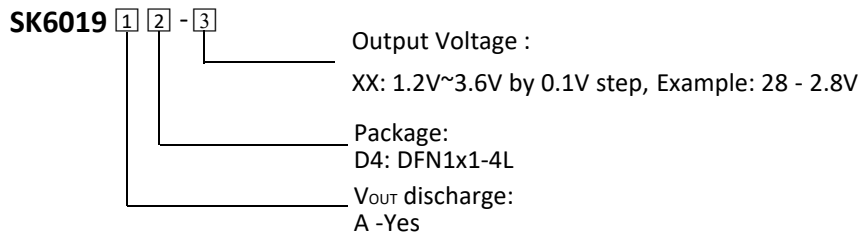
PIN NO	SYMBOL	I/O	DESCRIPTION
DFN1x1-4L			
1	VOUT	O	Output
2	GND	G	Ground
3	EN	I	Chip Enable, active high, do not float
4	VIN	P	Input power supply
Thermal Pad	-	/	Thermal pad, connect to GND

ORDER INFORMATION

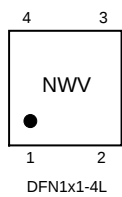
PART NO	PACKAGE	TEMPERATURE	TAPE & REEL
SK6019AD4-XX ^{Note}	DFN1x1-4L	-40 ~ +85°C	10000/REEL

Note: XX indicates 1.2V~3.6V by 0.1V step. For example, 28 means product outputs 2.8V.
SK6019 devices are Pb-free and RoHS compliant.

PART NUMBER RULES



MARKING DESCRIPTION



“N”: Product code, stands for “SK6019”.

“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)

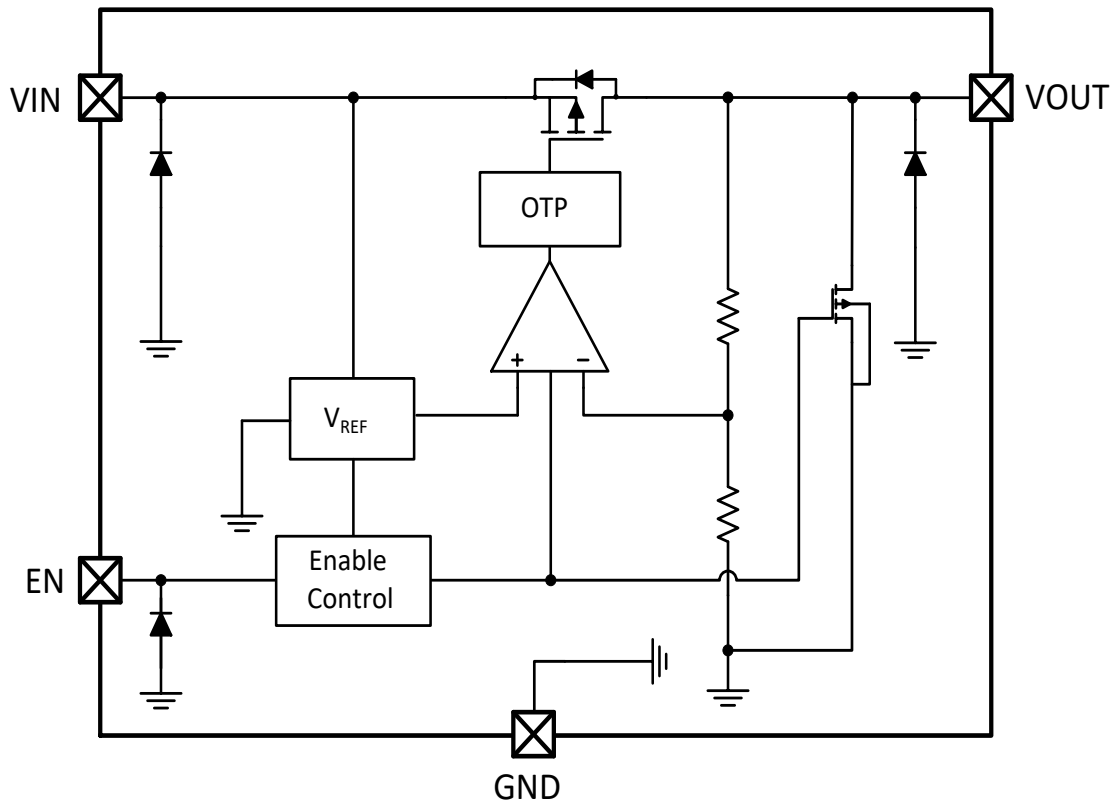
SYMBOL	ITEMS	VALUE	UNIT
V _{IN}	Input Voltage	-0.3~8	V
I _{OUT}	Output Current	750	mA
P _{DMAX}	Power Dissipation	0.5	W
R _{θJA}	Thermal resistance	220	°C/W
T _J	Junction Temperature	-40~150	°C
T _A	Ambient Temperature	-40~85	°C
T _{STG}	Storage Temperature	-55~150	°C
T _{SOLDER}	Package Lead Soldering Temperature	260°C, 10s	
ESD	HBM	±5.5	KV
LU	Latch up	±500	mA

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

RECOMMENDED OPERATING RANGE

SYMBOL	ITEMS	VALUE	UNIT
V _{IN}	Supply Voltage	2.5~6.5	V
C _{IN}	Input capacitor	1~10	μF
C _O	Output capacitor	1~10	μF
I _{OUT}	Output Current	<500	mA

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

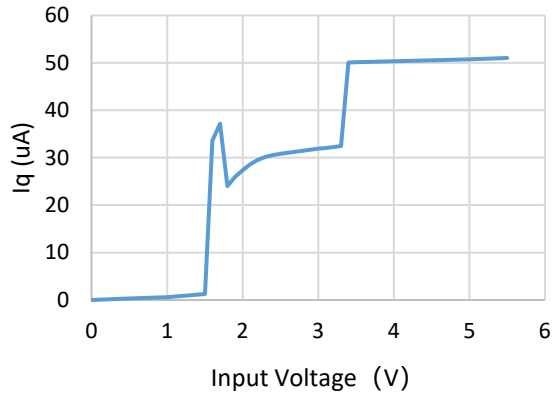
The following specifications apply for $V_{IN}=4.3V$, $V_{OUT}=3.3V$, $C_{IN}=1\mu F$, $C_{OUT}=1\mu F$, $T_A=25^\circ C$, unless specified otherwise.

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Voltage		2.5		6.5	V
V_{OUT}	Output Range	$V_{OUT} \leq 1.5V$, $V_{IN}=2.5V$, $I_{OUT}=1mA$	-30	V_{OUT}	30	mV
		$V_{OUT} > 1.5V$, $V_{IN}=V_{OUT}+1V$, $I_{OUT}=1mA$	-2	V_{OUT}	2	%
I_Q	Quiescent Current	$V_{OUT}=3.3V$, No load		50		μA
I_{LIMIT}	Maximum Output Current Limit	$V_{IN}=V_{EN}=4.3V$		800		mA
V_{DROP}	Dropout Voltage	$V_{OUT}=3.3V$, $I_{OUT}=200mA$		100		mV
		$V_{OUT}=3.3V$, $I_{OUT}=300mA$		150		
I_{SHORT}	V_{OUT} short current	$V_{IN}=V_{EN}=5V$ V_{OUT} Short to GND with 1Ω		0.23		A
ΔV_{LINE}	Line Regulation	$V_{IN}=3.5\sim 5.5V$, $I_{OUT}=1mA$			5	mV
ΔV_{LOAD}	Load Regulation	$V_{OUT}=3.3V$, $I_{OUT}=1\sim 300mA$			30	mV
I_{SHDN}	Shut-down Current	$V_{EN}=0V$			1	μA
PSRR	Power Supply Rejection Rate	$V_{IN}=5V_{DC}+0.2V_{P-P}$ $f=1KHz$, $I_{OUT}=30mA$		75		dB
		$V_{IN}=5V_{DC}+0.2V_{P-P}$ $f=100KHz$, $I_{OUT}=30mA$		50		
V_{ENH}	EN logic high voltage	$V_{IN}=5.5V$, $I_{OUT}=1mA$	1.2			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
e_{NO}	Output Noise Voltage	10Hz to 100KHz, $C_{OUT}=1\mu F$		25		μV_{RMS}
T_{SD}	Thermal Shutdown Protection	$V_{IN}=V_{EN}=4.3V$, $I_{OUT}=1mA$		160		$^\circ C$
R_{DIS}	Output Discharge Resistance (A version only)	$V_{IN}=5V$, $V_{EN}=0V$		160		Ω

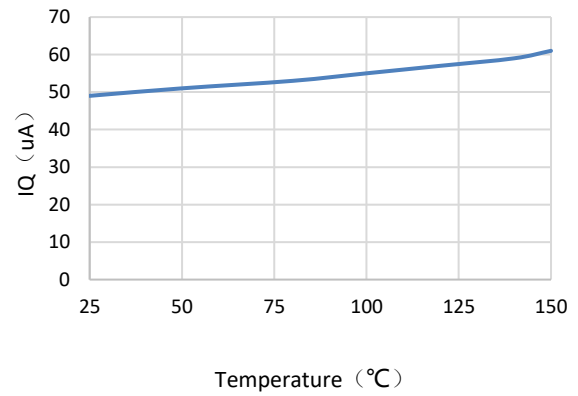
TYPICAL PERFORMANCE CHARACTERISTICS

$C_{IN}=1\mu F$, $C_{OUT}=1\mu F$, $V_{IN}=4.3V$, $V_{OUT}=3.3V$, $T_A=25^\circ C$, unless specified otherwise.

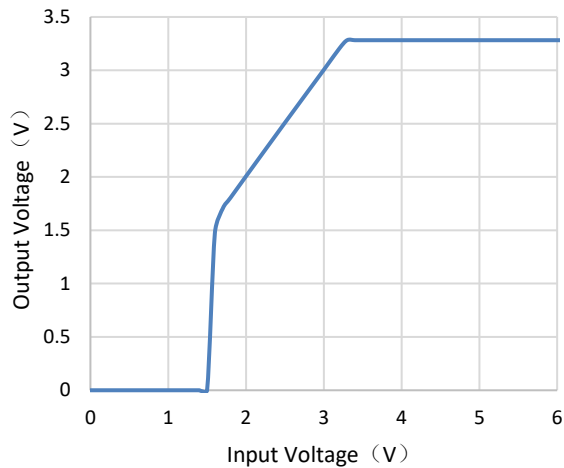
IQ vs. Input Voltage



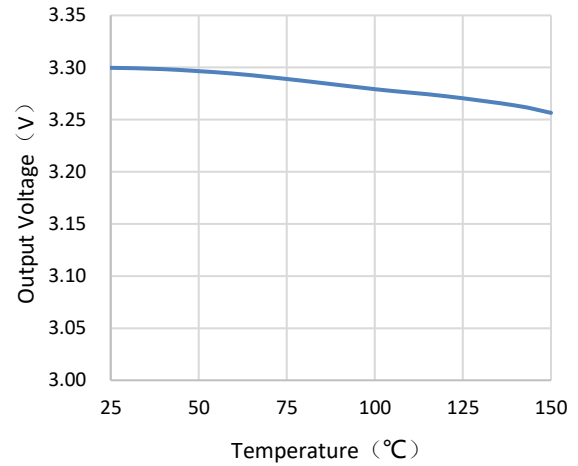
IQ vs. Temperature



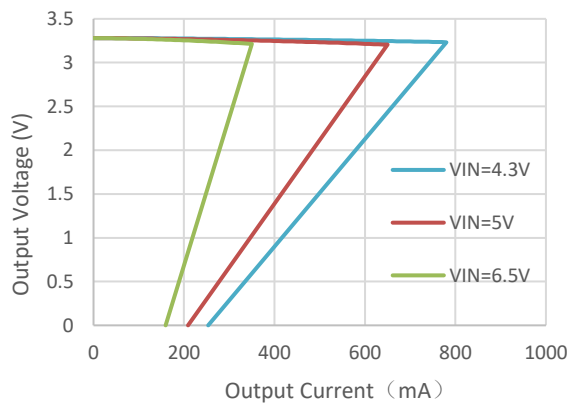
Output Voltage vs. Input Voltage



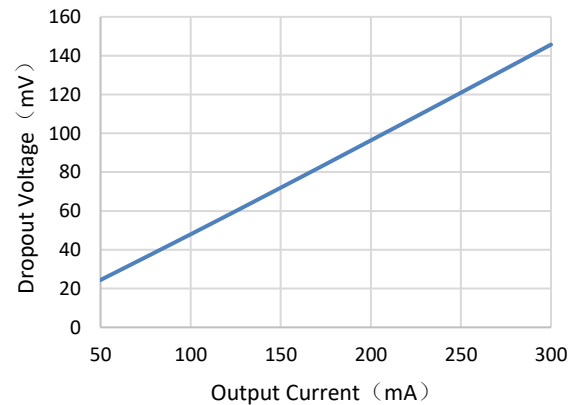
Output Voltage vs. Temperature

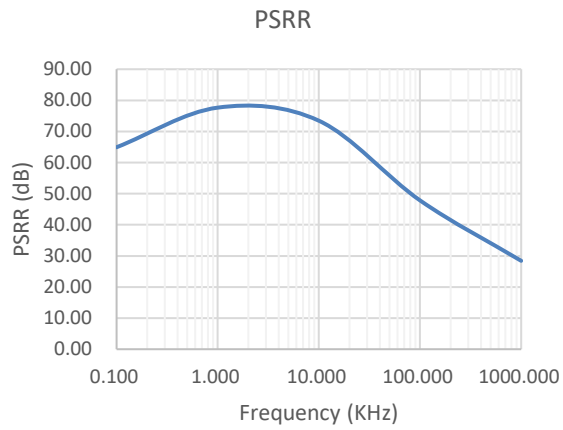


Output voltage vs. Output current



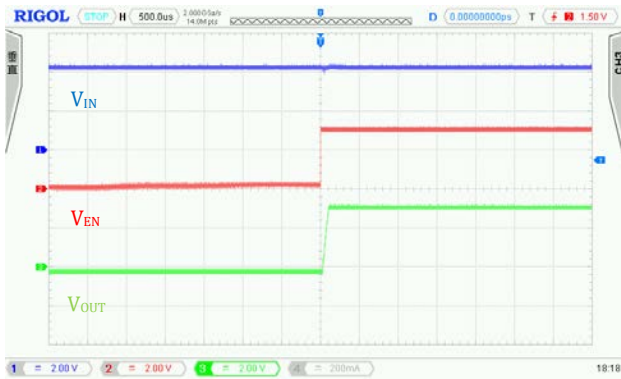
Dropout Voltage vs. Output Current





EN ON/OFF

EN=0V to 3V, $I_{OUT}=10mA$

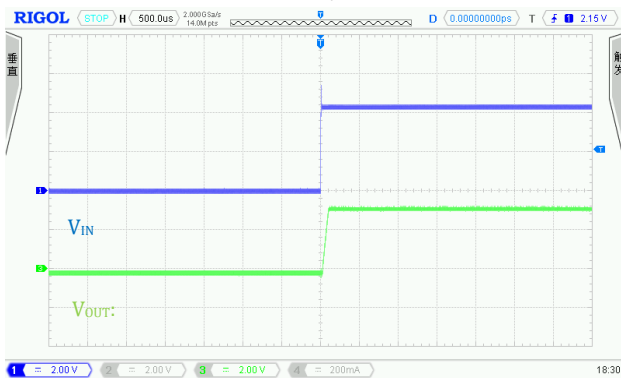


EN=3V to 0V, $I_{OUT}=10mA$



POWER ON/OFF

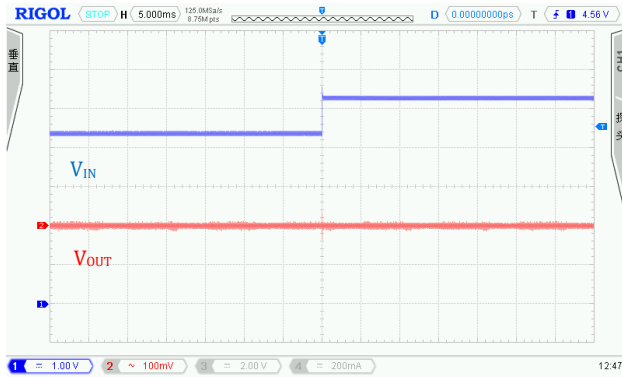
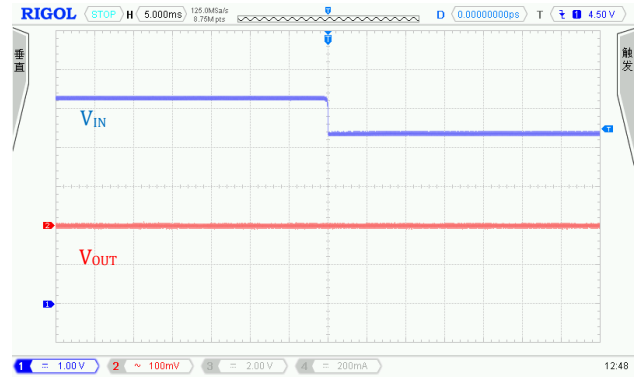
$V_{IN}=0V$ to 4.3V, $I_{OUT}=10mA$



$V_{IN}=4.3V$ to 0V, $I_{OUT}=10mA$



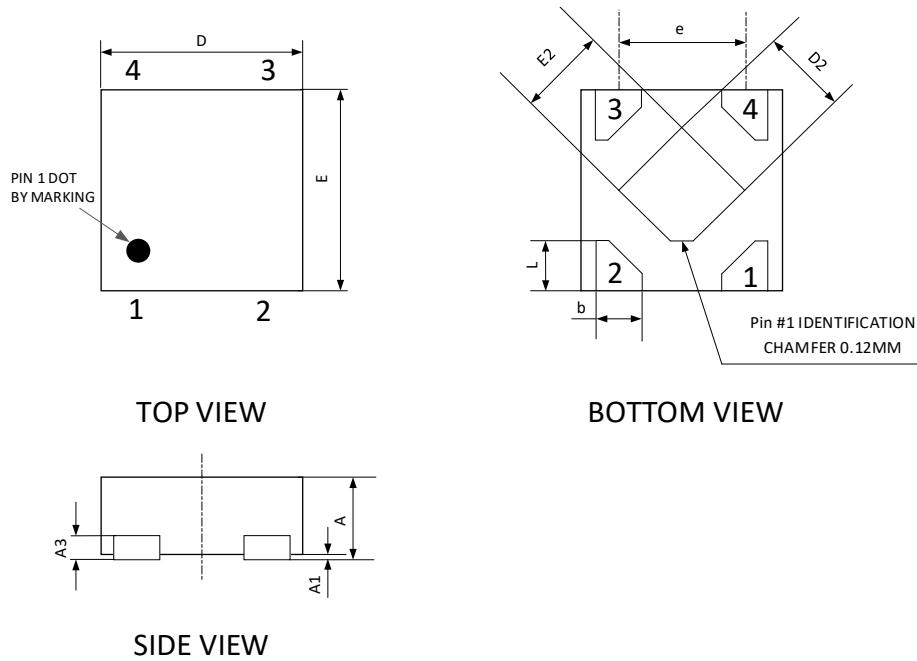
LINE TRANSIENT

 $V_{IN}=4.3V$ to $5.3V$, $I_{OUT}=10mA$  $V_{IN}=5.3V$ to $4.3V$, $I_{OUT}=10mA$ 

LOAD TRANSIENT

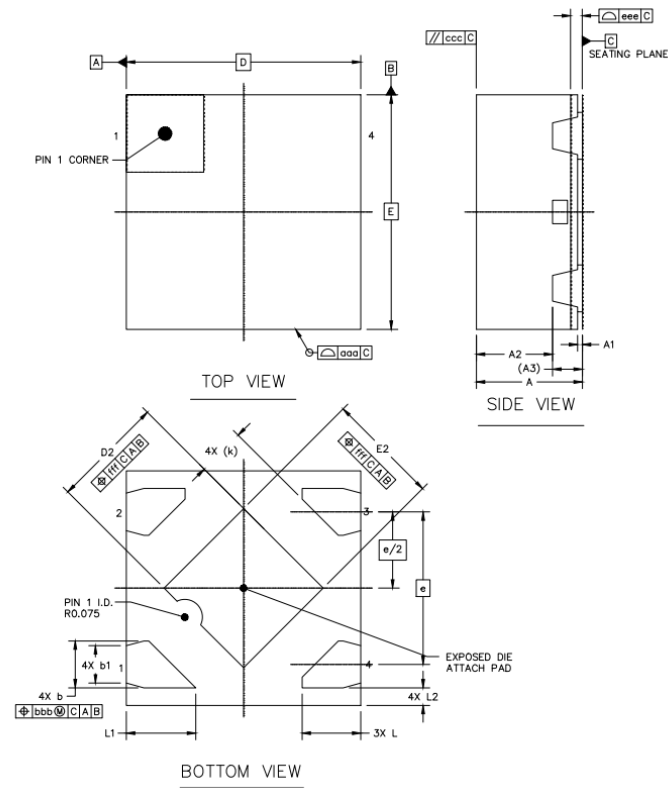
 $V_{IN}=4.3V$, $I_{OUT}=1mA$ to $60mA$  $V_{IN}=4.3V$, $I_{OUT}=1mA$ to $200mA$ 

PACKAGE DIMENSIONS: DFN1X1-4L (#1)



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		