

GENERAL DESCRIPTION

The SGM3204 is a charge pump voltage inverter that is designed for operating over an input voltage range of 1.4V to 5.5V. The SGM3204 can provide up to 200mA output current. The typical conversion efficiency exceeds 80% over a wide range of output current. The wide supply voltage is well suited for various applications powered by a 1-cell Li-Ion battery, as well as 2-cell or 3-cell NiCd, NiMH or Alkaline batteries.

The shutdown current is less than 1µA. This device requires one flying capacitor and two small bypass capacitors for a complete charge pump inverter, making it ideal for numerous battery-powered and board level applications.

The SGM3204 is available in a Green SOT-23-6 package. It operates over an ambient temperature range of -40°C to +85°C.

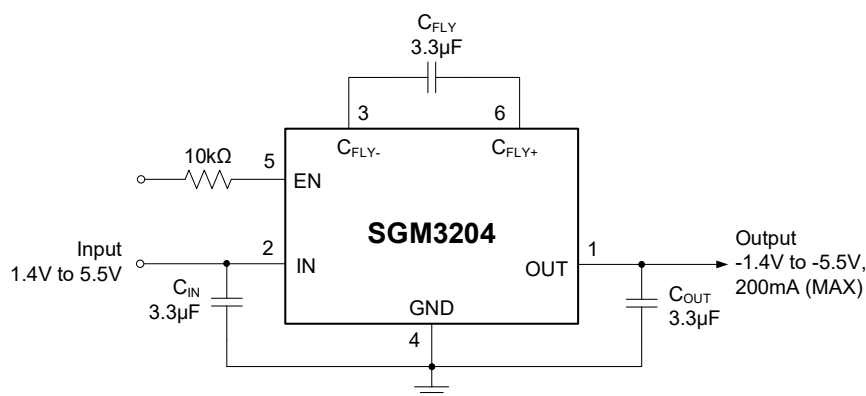
FEATURES

- **Input Voltage Range: 1.4V to 5.5V**
- **Inverts Input Supply Voltage**
- **Output Current: 200mA**
- **Quiescent Current: 1.5mA (TYP)**
- **Switching Frequency: 950kHz**
- **Integrated Active Schottky Diode for Startup into Load**
- **-40°C to +85°C Operating Temperature Range**
- **Available in a Green SOT-23-6 Package**

APPLICATIONS

- LCD Panel Bias
- Bipolar Amplifier Supply
- GaAs Bias for RF Power Amplifier

TYPICAL APPLICATION



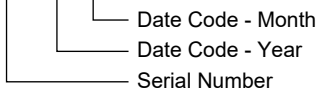
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM3204	SOT-23-6	-40°C to +85°C	SGM3204YN6G/TR	SL6XX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XX = Date Code.

YYY X X



Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

Voltage Range

IN to GND.....	-0.3V to 6V
OUT to GND.....	-6V to 0.3V
C _{FLY-} to GND.....	0.3V to V _{OUT} - 0.3V
C _{FLY+} to GND.....	-0.3V to V _{IN} + 0.3V
Continuous Output Current.....	250mA
Junction Temperature.....	+150°C
Storage Temperature Range.....	-65°C to +150°C
Lead Temperature (Soldering, 10s).....	+260°C

ESD Susceptibility

HBM.....	7000V
MM.....	400V

RECOMMENDED OPERATING CONDITIONS

Input Voltage Range.....	1.4V to 5.5V
Operating Temperature Range.....	-40°C to +85°C

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

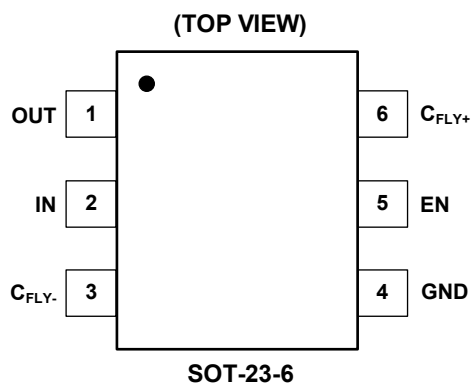
ESD SENSITIVITY CAUTION

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

PIN CONFIGURATION



PIN DESCRIPTION

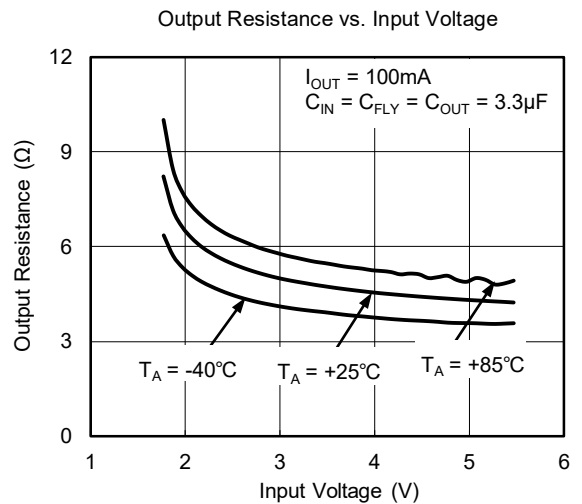
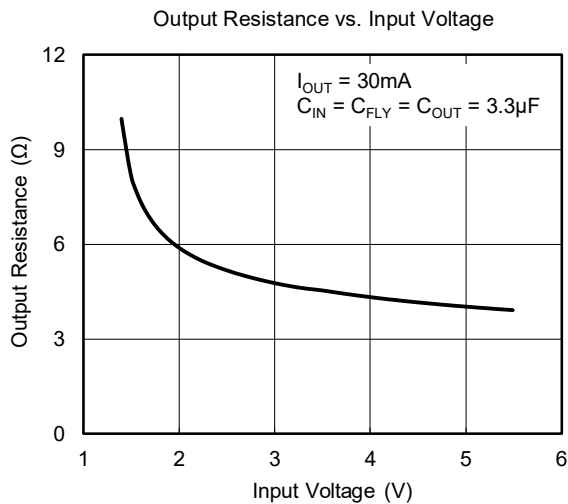
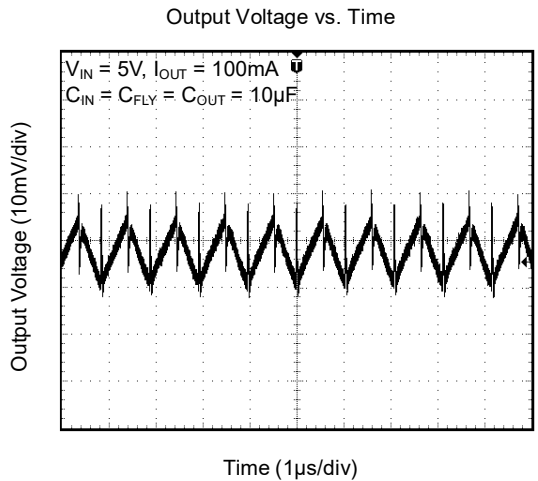
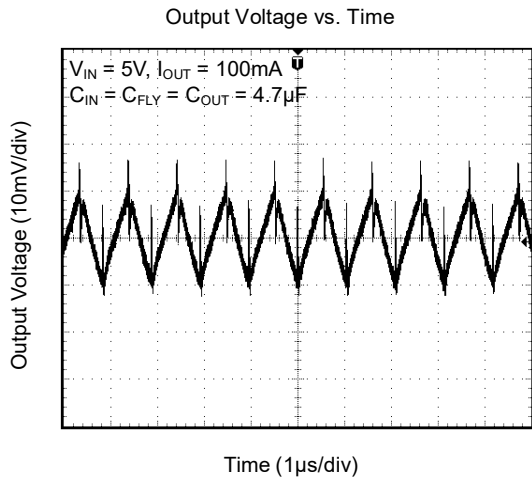
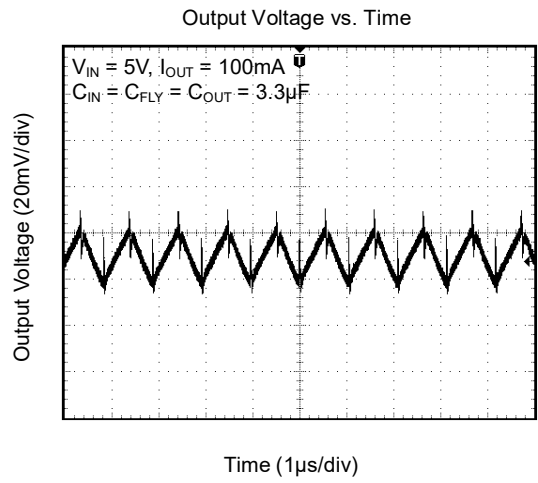
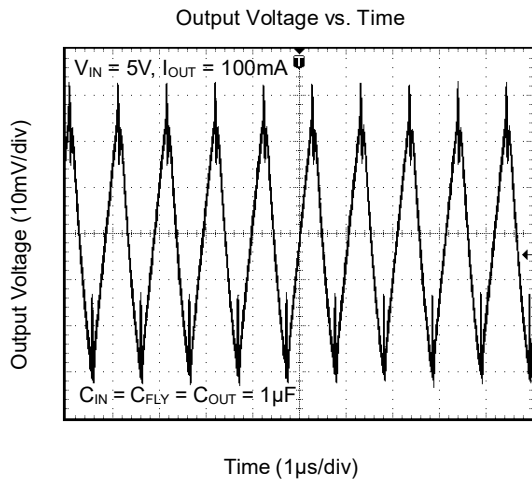
PIN	NAME	FUNCTION
1	OUT	Power Output Pin. It is recommended that the filter capacitor C_{OUT} bypass OUT to GND.
2	IN	Power Input Pin. A ceramic bypass capacitor that has the same value as the flying capacitor to GND is recommended.
3	C_{FLY-}	Flying Capacitor Negative Terminal.
4	GND	Ground.
5	EN	Enable Control Pin. Logic high to enable normal operation and logic low to shut down chip.
6	C_{FLY+}	Flying Capacitor Positive Terminal.

ELECTRICAL CHARACTERISTICS(V_{IN} = 5V, C_{IN} = C_{FLY} = C_{OUT} = 3.3μF, Full = -40°C to +85°C. Typical values are at T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS	
Input Voltage Range	V _{IN}	R _L = 5kΩ	Full	1.4		5.5	V	
Maximum Output Current at OUT	I _{OUT}		Full	200			mA	
Output Voltage	V _{OUT}		+25°C		-V _{IN}		V	
Output Voltage Ripple	V _{PP}	I _{OUT} = 100mA, C _{FLY} = C _{OUT} = 3.3μF	+25°C		30		mV _{P-P}	
Quiescent Current (No Load Input Current)	I _Q		+25°C		1.5	1.75	mA	
			Full			1.84		
			Shutdown mode	+25°C		0.7	1	μA
				Full			3	
Internal Switching Frequency	f _{OSC}		+25°C	800	950	1100	kHz	
			Full	750		1150		
Impedance		I _{OUT} = 100mA	+25°C		4.2	5.3	Ω	
			Full			6.2		
Input High Voltage	V _{INH}		Full	1.5			V	
Input Low Voltage	V _{INL}		Full			0.4	V	

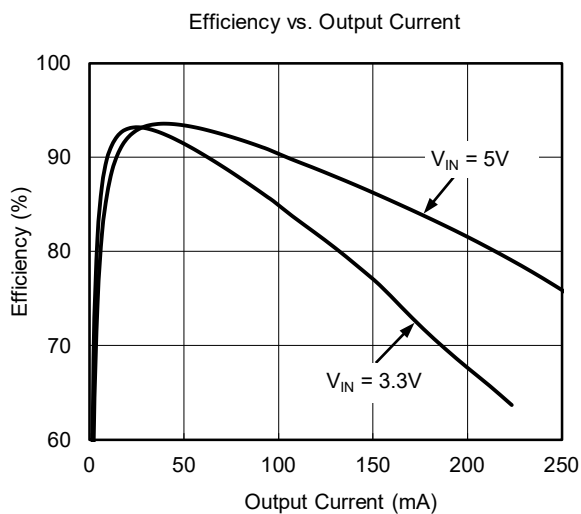
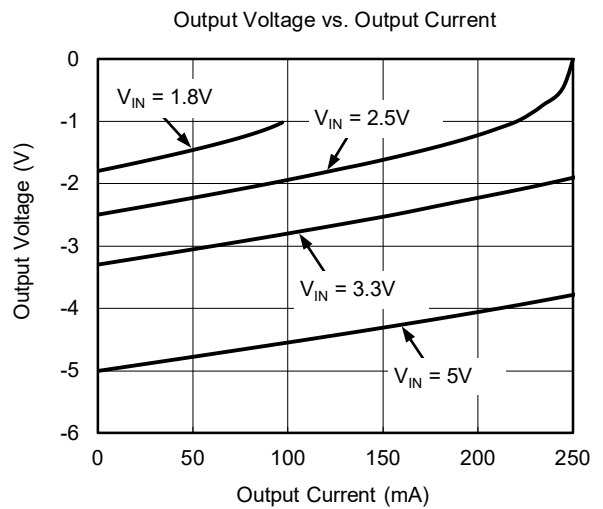
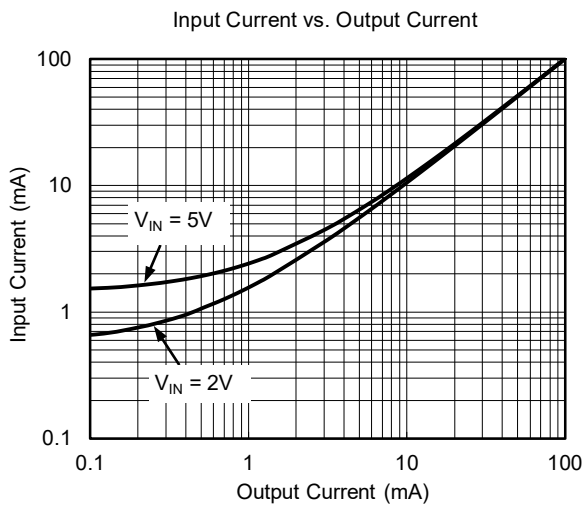
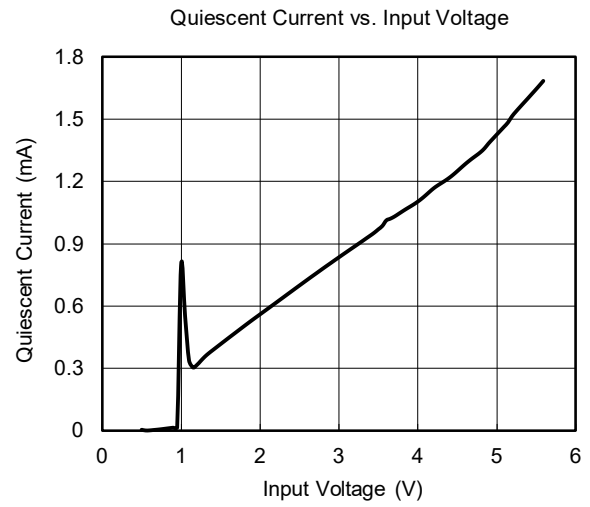
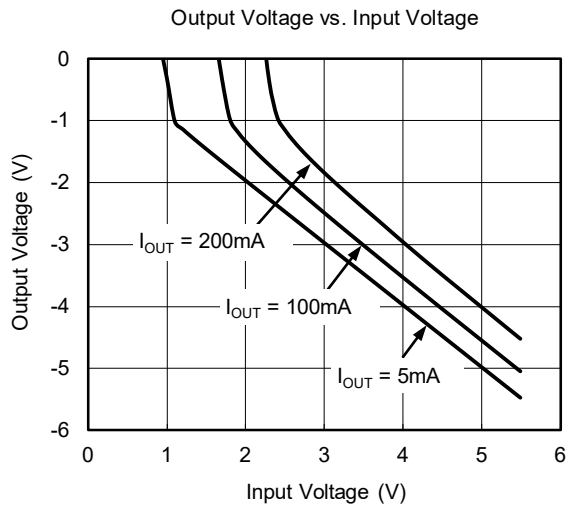
TYPICAL PERFORMANCE CHARACTERISTICS

T_A = +25°C, unless otherwise noted.



TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$T_A = +25^\circ\text{C}$, $C_{IN} = C_{FLY} = C_{OUT} = 3.3\mu\text{F}$, unless otherwise noted.



REVISION HISTORY

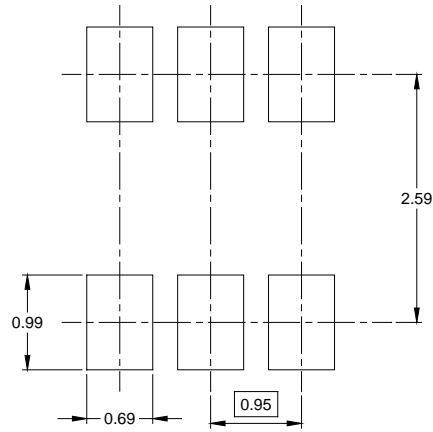
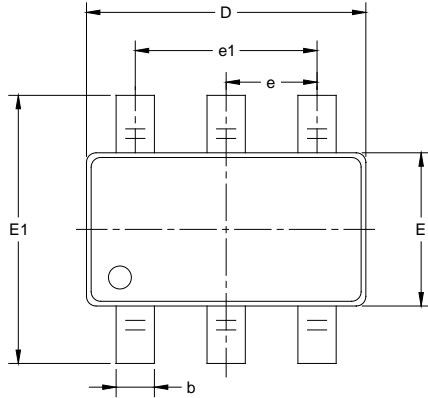
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

NOVEMBER 2021 – REV.A to REV.A.1	Page
Added Recommended Operating Conditions section	2

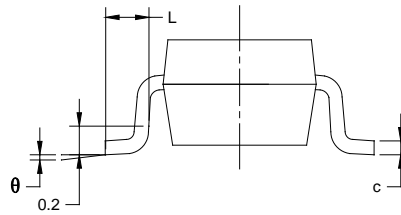
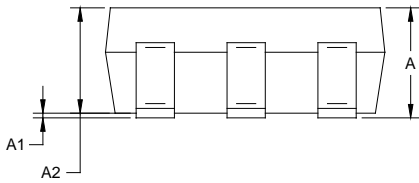
Changes from Original (JANUARY 2014) to REV.A	Page
Changed from product preview to production data.....	All

PACKAGE OUTLINE DIMENSIONS

SOT-23-6



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

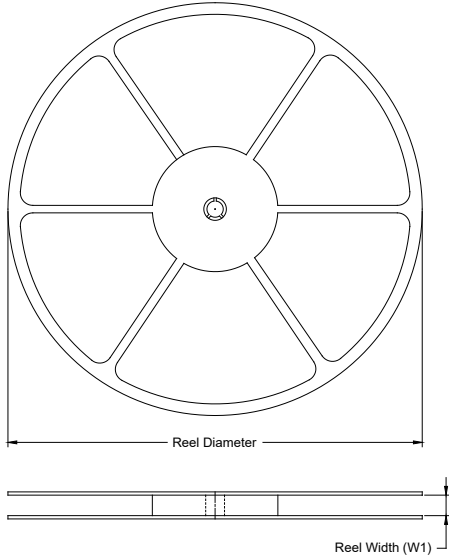
NOTES:

1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

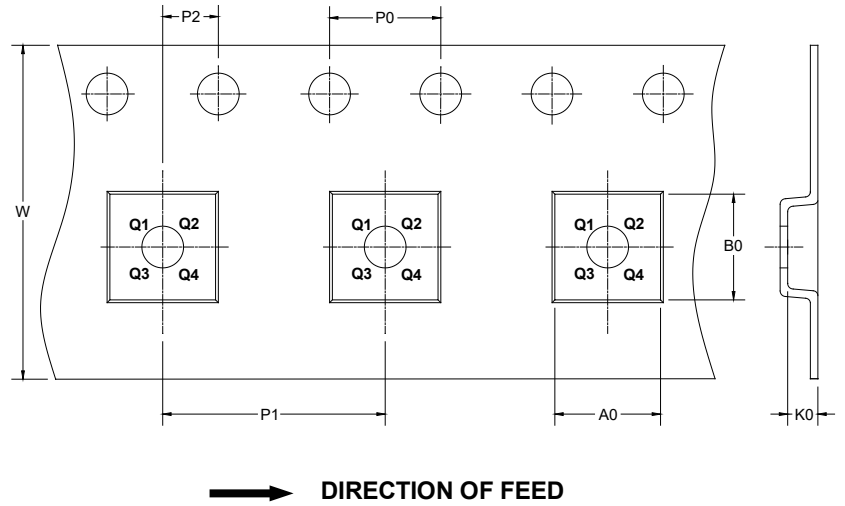
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

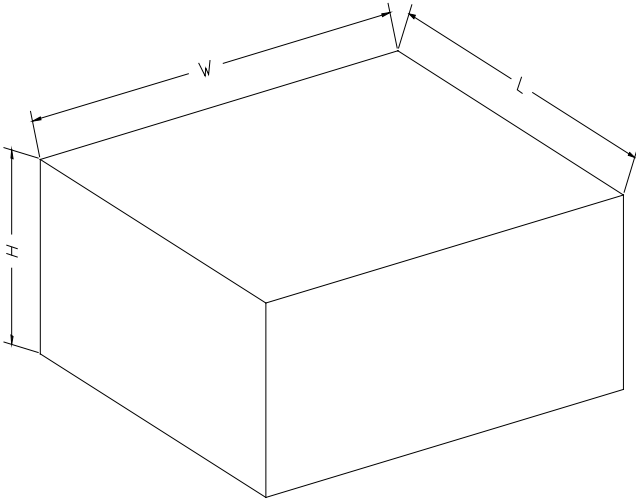
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOT-23-6	7"	9.5	3.23	3.17	1.37	4.0	4.0	2.0	8.0	Q3

DD0001

PACKAGE INFORMATION

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7" (Option)	368	227	224	8
7"	442	410	224	18

DD0002