

**Features**

- Provides bias for GaAs and HEMT FETs
- Drives up to four FETs
- Dynamic FET protection
- Drain current set by external resistor
- Regulated negative rail generator requires only 2 external capacitors
- Choice in drain voltage
- Wide supply voltage range
- SSOP surface mount package

**Applications**

- Satellite receiver LNBS
- Private mobile radio (PMR)
- Cellular telephones

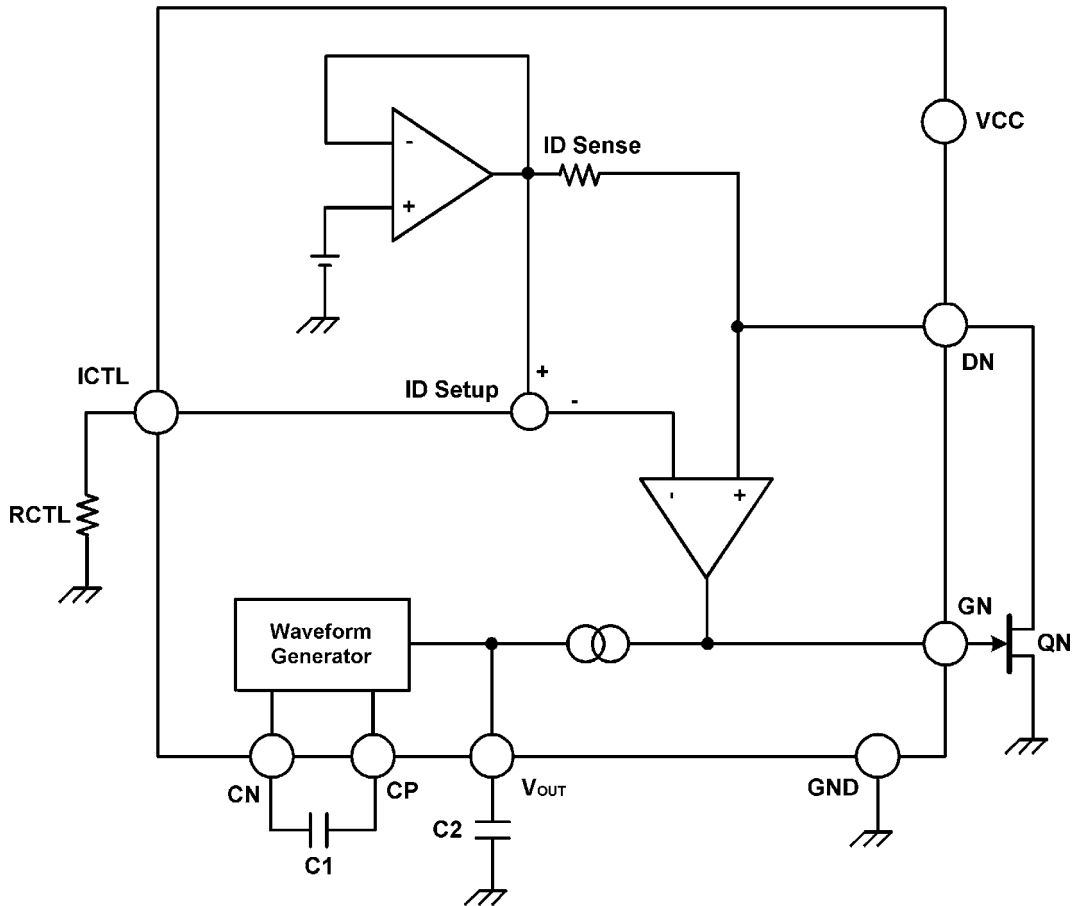
**Block Diagram**

**Description**

The AT1504 is designed to meet the bias requirements of GaAs and HEMT FETs commonly used in satellite receiver LNBS, PMR, cellular telephones etc. with a minimum of external components.

With the addition of two capacitors and resistors the devices provide drain voltage and current control for a number of external grounded source FETs.

The AT1504 is available in SSOP16 pin packages respectively for the minimum in devices size. Device operating temperature is -40 to 70°C to suit a wide range of environmental conditions.

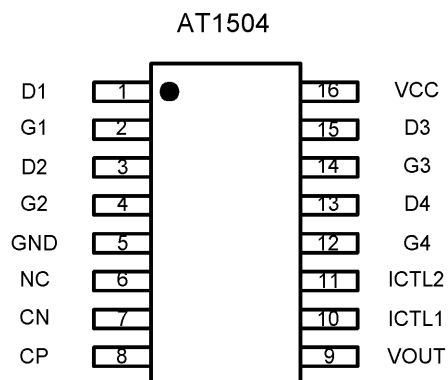


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### Pin Descriptions

Pin No.	Pin name	Function
1	D1	1st Drain output voltage Pin
2	G1	1st Gate output voltage Pin
3	D2	2nd Drain output voltage Pin
4	G2	2nd Gate output voltage Pin
5	GND	Ground Pin
6	NC	No connect Pin
7	CN	Negative OSC output Pin
8	CP	Positive OSC output Pin
9	VOUT	Negative voltage output Pin
10	ICTL1	VD1/VD2 Current set Resistor connect Pin
11	ICTL2	VD3/VD4 Current set Resistor connect Pin
12	G4	4th Gate output voltage Pin
13	D4	4th Drain output Pin
14	G3	3rd Gate output voltage Pin
15	D3	3rd Drain output voltage Pin
16	VCC	Supply voltage Pin

### Pin Configuration



### Ordering Information

Part number	Package	Marking
AT1504R	SSOP16	AT1504R
AT1504R GRE	SSOP16,Green	AT1504R, date code with one bottom line

**Absolute maximum ratings (Ta = 25°C)**

Parameter	Symbol	Limits	unit
Power supply voltage	V <sub>CC</sub>	-0.6~15	V
Supply Current	I <sub>CC</sub>	100	mA
Drain Current	V <sub>D</sub>	0~15	mA
Operating temperature	T <sub>opr</sub>	-40~+70	°C
Storage temperature	T <sub>stg</sub>	-50~+85	°C
Power dissipation	P <sub>d</sub>	500	mW

**Recommended operating conditions (Ta = 25°C)**

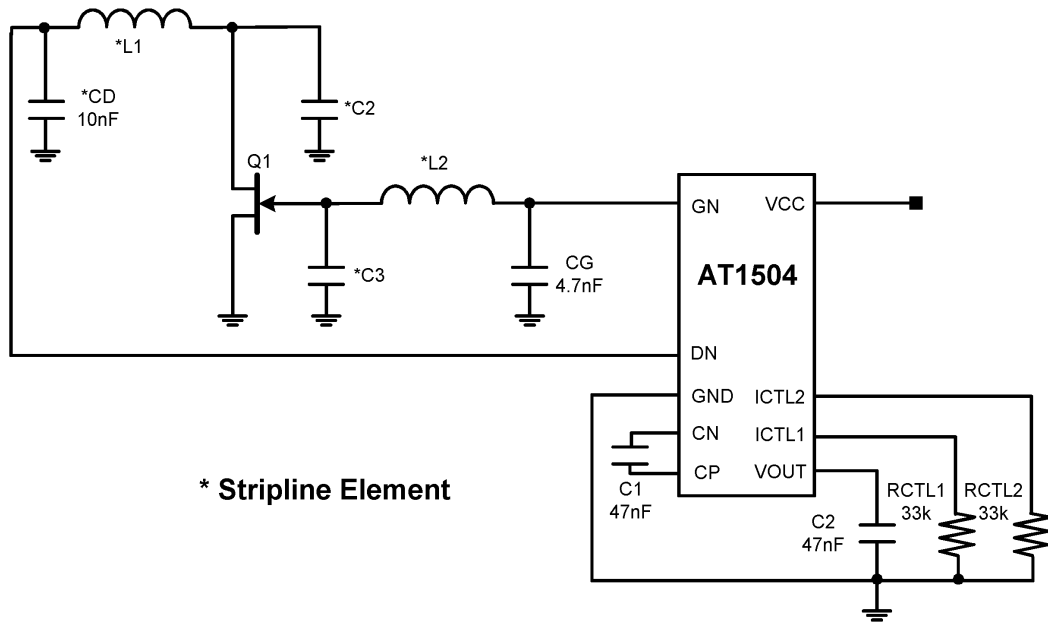
Parameter	Symbol	Limits	unit
Power supply voltage	V <sub>CC</sub>	5~12	V

**Electrical characteristics**

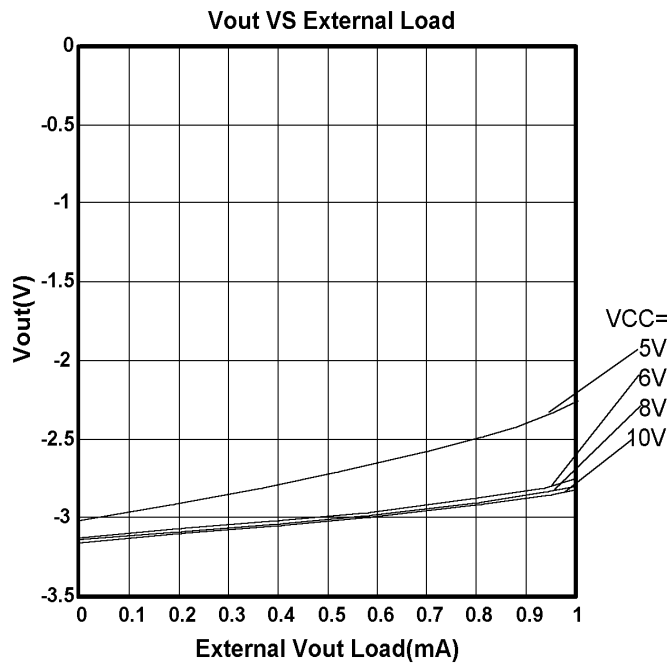
(Unless otherwise stated, Ta=25°C, V<sub>CC</sub>=5V, I<sub>D</sub>=10mA, R<sub>CTL1</sub>=33kΩ, R<sub>CTL2</sub>=33kΩ)

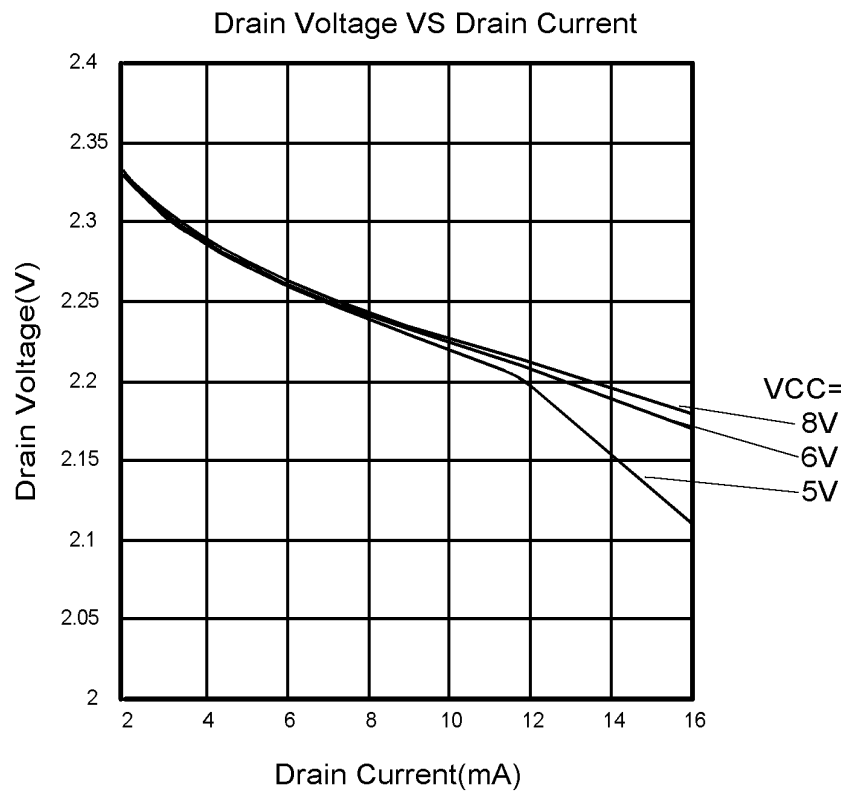
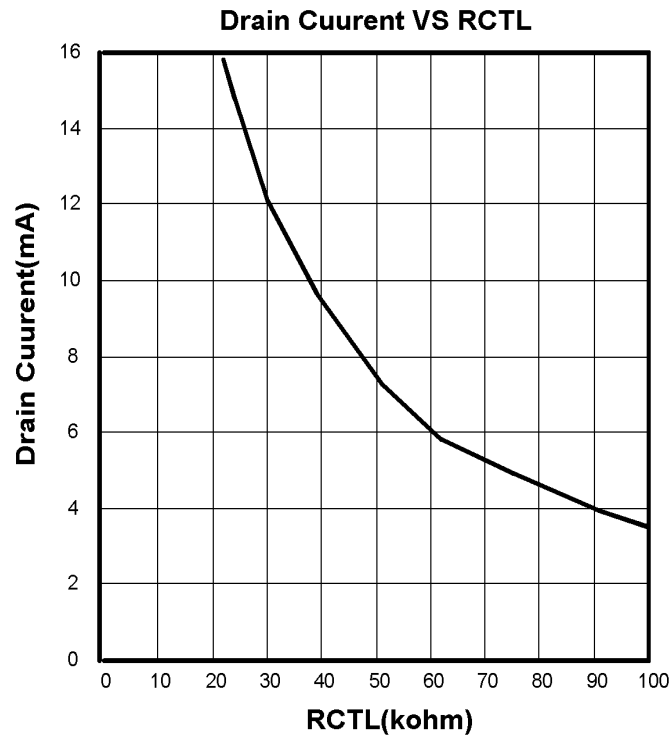
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	V <sub>CC</sub>	5	--	12	V	
Supply Current	I <sub>CC</sub>	--	--	10	mA	I <sub>D1</sub> to I <sub>D4</sub> =0
		--	--	50	mA	I <sub>D1</sub> to I <sub>D4</sub> =10mA
Negative Voltage	V <sub>OUT</sub>	-3.5	-3	-2	V	I <sub>OUT</sub> = 0
		--	--	-2	V	I <sub>OUT</sub> = -200μA
Drain Output Noise Voltage	E <sub>ND</sub>	--	--	0.02	V <sub>PP</sub>	C <sub>G</sub> =4.7nF, C <sub>D</sub> =10nF
Gate Output Noise Voltage	E <sub>NG</sub>	--	--	0.005	V <sub>PP</sub>	C <sub>G</sub> =4.7nF, C <sub>D</sub> =10nF
Oscillator Freq.	f <sub>o</sub>	200	350	800	kHz	
<b>DRAIN</b>						
Drain Current	I <sub>D</sub>	8	10	12	mA	
Drain Current Charge with V <sub>CC</sub>	ΔI <sub>DV</sub>	--	0.02	--	%/V	V <sub>CC</sub> =5 to 12V
Drain Current Charge with T <sub>i</sub>	ΔI <sub>DT</sub>	--	0.05	--	%/°C	T <sub>i</sub> =-40 to +70°C
Drain Voltage	V <sub>D</sub>	2	2.2	2.4	V	
Drain Voltage Charge with V <sub>CC</sub>	ΔV <sub>DV</sub>	--	0.5	--	%/V	V <sub>CC</sub> =5 to 12V
Drain Voltage Charge with T <sub>i</sub>	ΔV <sub>DT</sub>	--	50	--	ppm	T <sub>i</sub> =-40 to +70°C
<b>GATE</b>						
Gate Output Current Range	I <sub>GO</sub>	-30	--	2000	μA	
Gate Output Low Voltage	V <sub>OL</sub>	-3.5	--	-2	V	I <sub>D1</sub> to I <sub>D4</sub> =12mA I <sub>G1</sub> to I <sub>G4</sub> =0
		-3.5	--	-2	V	I <sub>D1</sub> to I <sub>D4</sub> =12mA I <sub>G1</sub> to I <sub>G4</sub> = -10μA
Gate Output High Voltage	V <sub>OH</sub>	0	--	1	V	I <sub>D1</sub> to I <sub>D4</sub> = 8mA I <sub>G1</sub> to I <sub>G4</sub> = 0

**Typical Application Circuit**

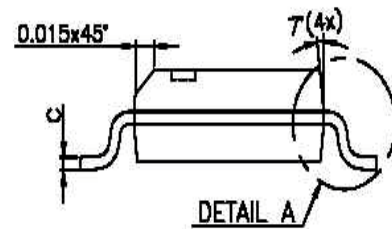
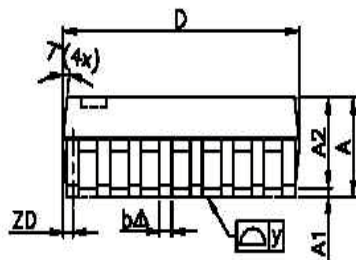
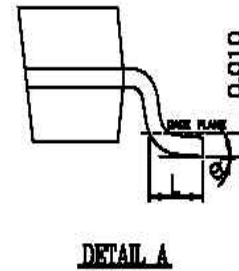
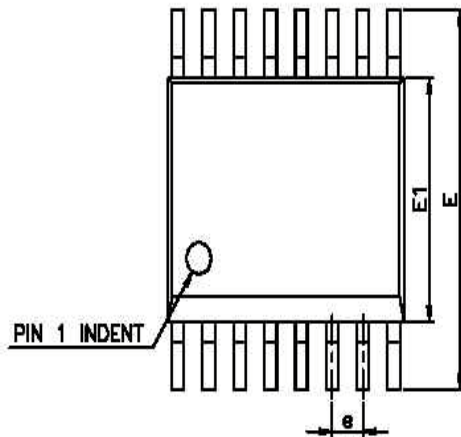


**Typical Characteristics**





Package Outlines : 16-pin SSOP



SYMBOL	MILLIMETERS			INCHES		
	MIN	TYP	MAX	MIN	TYP	MAX
A	1.35	1.60	1.75	0.053	0.063	0.069
A1	0.10	0.15	0.25	0.004	0.006	0.010
A2	-	-	1.50	-	-	0.059
b	0.20	-	0.30	0.008	-	0.012
C	0.18	-	0.25	0.007	-	0.010
D	4.80	4.85	5.00	0.189	0.191	0.197
ZD	-	0.20	-	-	0.008	-
E	5.79	5.99	6.20	0.228	0.236	0.244
E1	3.81	3.91	3.99	0.150	0.154	0.157
L	0.41	0.71	1.27	0.016	0.028	0.050
e	-	0.64	-	-	0.025	-
y	-	-	0.076	-	-	0.003
θ	0°	-	8°	0°	-	8°