LINEAR SYSTEMS

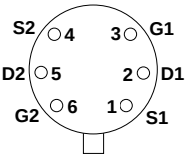
Improved Standard Products®

VCR11N

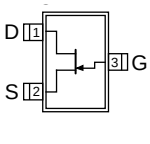
N-Channel JFET, Voltage Controlled Resistor

Simplify your Gain Control and Attenuation Designs Using Fewer Parts

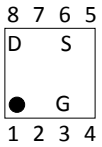
ABSOLUTE MAXIMUM RATINGS[1] @ 25 °C (unless otherwise stated)	
Maximum Temperatures	
Storage Temperature	-65 to +150°C
Junction Operating Temperature	-55 to +135°C
Maximum Power Dissipation	
Continuous Power Dissipation @ Ta= +25°C	300mW
Maximum Currents	
Gate Forward Current	$I_{G(F)}$ = 10mA
Maximum Voltages	
Gate to Source	V_{GSS} = -25V
Gate to Drain	V_{GDS} = -25V



TO-71 6L
Top View



SOT-23 6L
Top View



DFN 8L
Top View

Features

- Continuous Voltage-Controlled Resistance
- High Off-Isolation
- High Input Impedance
- Gain Ranging Capability
- Simplified Drive Voltage Capabilities
- No Circuit Interaction
- Wide Range Signal Attenuation
- Pin-for-Pin Replacement for Siliconix VCR11N

Benefits

- Wide Range Signal Attenuation
- Gain Ranging
- Simplified Gate Drive
- High Breakdown Voltage
- No Circuit Interaction

Applications

- Amplifier Gain Control
- Oscillator Amplitude Control
- Small Signal Attenuations
- Filters

Description

A voltage-controlled resistor (VCR) is a three-terminal variable resistor where the resistance value between two of the terminals is controlled by a voltage potential applied to the third. The VCR is capable of operation as a symmetrical resistor with no dc bias voltage in the signal loop, an ideal characteristic for many applications.

The VCR11N is specially intended for applications where the drain-source voltage is a low-level AC signal with no DC component. The key device performance is the predictable RDS change with no change in V_{GS} voltage. The VCR11N is available in the TO-71 6 lead package.

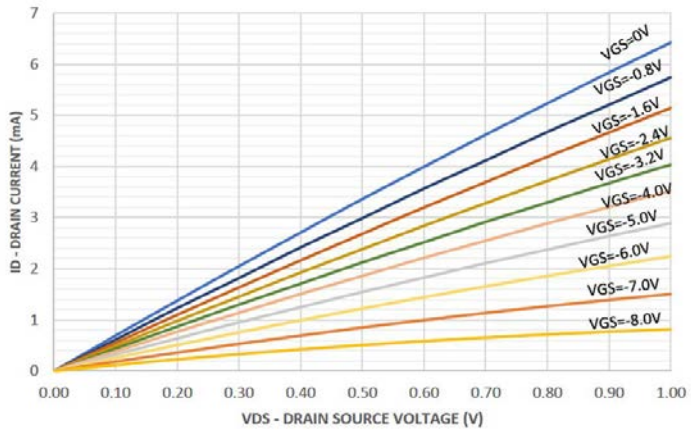
Electrical Characteristics @ Tj= 25°C (unless otherwise stated)

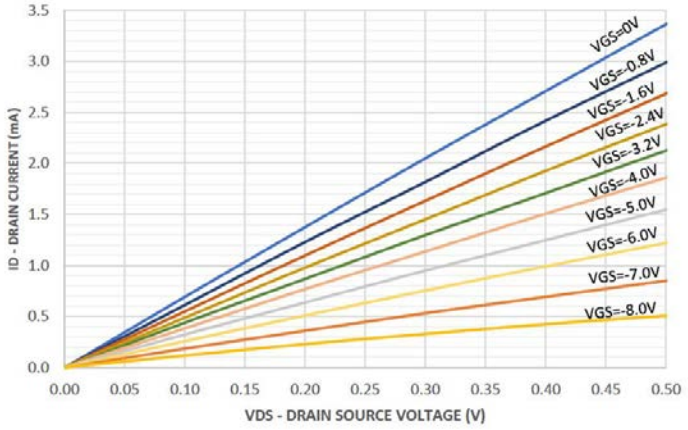
SYMBOL	CHARACTERISTIC	MIN	TYP	MAX	UNITS	CONDITIONS
BV_{GSS}	Gate to Source Breakdown Voltage	-25			V	I_G = -1µA, V_{DS} = 0V
$V_{GS(OFF)}$	Gate to Source Pinch-off Voltage	-8		-12	V	I_D = 1µA, V_{DS} 10V
I_{GSS}	Gate to Source Leakage Current			-0.2	nA	V_{GS} = -15V, V_{DS} = 0V
$r_{DS(on)}$	Dynamic Drain to Source "ON" Resistance	100		200	Ω	V_{GS} =0V, I_D=500µA
		100		200	Ω	V_{GS} =0V, I_D=1mA
r_{DS1}/r_{DS2}	Static Drain to Source "ON" Resistance Ratios	0.95		1		V_{GS} =0V, I_D=500µA
		0.95		1		V_{GS} =0V, I_D=1mA
C_{dgo}	Drain to Gate Capacitance			8	pF	V_{GD} =-10V, I_S=0A, *f*=1MHz
C_{dgo}	Source to Gate Capacitance			8	pF	V_{GS} =-10V, I_D=0A, *f*=1MHz

N-Channel JFET, Voltage Controlled Resistor

Typical Characteristics

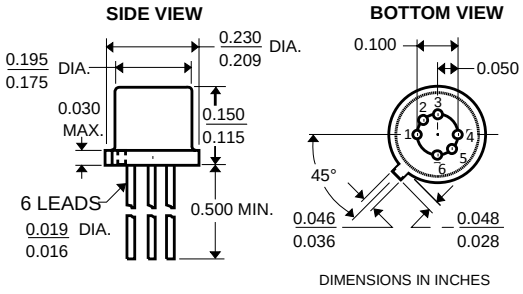
Output Characteristics
VCR11N



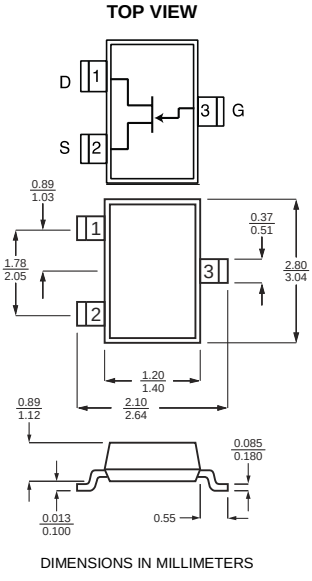


Package Dimensions

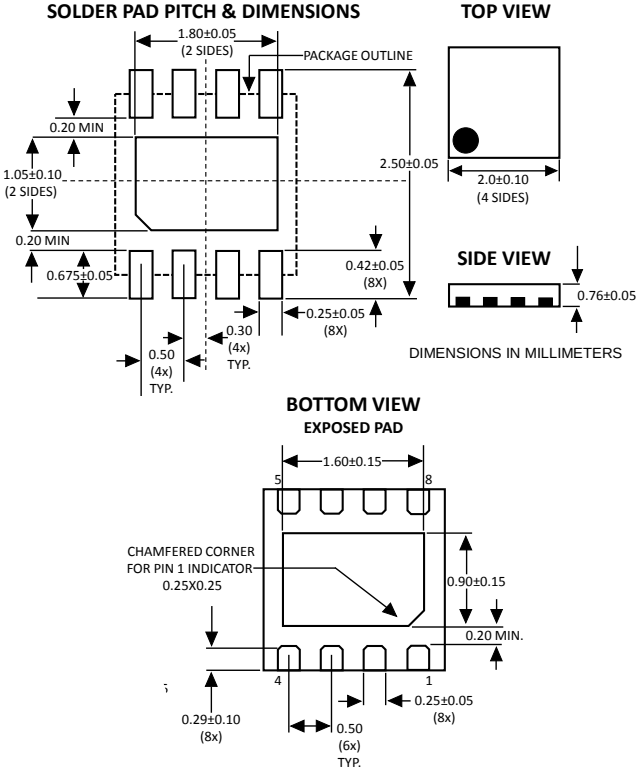
TO-71 6 Lead



SOT-23 6 Lead



DFN 8 Lead



Ordering Information

STANDARD PART CALL-OUT
VCR11N TO-71 6L RoHS
VCR11N SOT-23 6L RoHS
VCR11N DFN 8L RoHS
CUSTOM PART CALL-OUT
(CUSTOM PARTS INCLUDE SEL + 4 DIGIT NUMERIC CODE)
VCR11N TO-71 6L RoHS SELXXXX
VCR11N SOT-23 6L RoHS SELXXXX
VCR11N DFN 8L RoHS SELXXXX

Notes

1. Absolute maximum ratings are limiting values above which serviceability may be impaired.
2. Pulse Test: PW ≤ 300µs, Duty Cycle ≤ 3%
3. All characteristics MIN/TYP/MAX numbers are absolute values. Negative values indicate electrical polarity only.
4. When ordering include the full Linear Systems part number and package type. Linear Systems creates custom parts on a case by case basis. To learn whether Linear Systems can meet your requirements, please send your drawing along with a detailed description of the device specifications to sales@linearsystems.com. One of our qualified representatives will contact you.
5. All standard parts are RoHS compliant. Contact the factory for availability of non-RoHS parts.
6. Information furnished by Linear Integrated Systems is believed to be accurate and reliable. However, no responsibility is assumed for its use; nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Linear Integrated Systems.