HARRIS SEMICONDUCTOR

CA3141

High-Voltage Diode Array For Commercial, Industrial & Military Applications

March 1993

Features

- **Matched Monolithic Construction - V_F for Each Diode Pair Matched to Within 0.55mV (Typ) at I_F = 1mA**
- **Low Diode Capacitance - 0.3pF (Typ) at V_R = 2V**
- **High Diode-to-Substrate Breakdown Voltage - 30V (Min)**
- **Low Reverse (Leakage) Current - 100nA (Max)**

Applications

- **Balanced Modulators or Demodulators**
- **Analog Switches**
- **High-Voltage Diode Gates**
- **Current Ratio Detectors**

Description

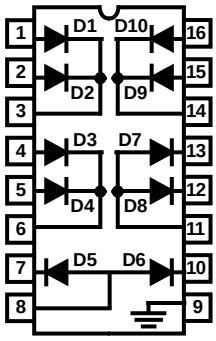
The CA3141E High Voltage Diode Array Consists of ten general purpose high reverse breakdown diodes. Six diodes are internally connected to form three common cathode diode pairs, and the remaining four diodes are internally connected to form two common anode diode pairs. Integrated circuit construction assures excellent static and dynamic matching of the diodes, making the CA3141 extremely useful for a wide variety of applications in communications and switching systems.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
CA3141E	-55°C to +125°C	16 Lead Plastic DIP

Pinout

CA3141
(PDIP)
TOP VIEW



CAUTION: These devices are sensitive to electrostatic discharge. Users should follow proper I.C. Handling Procedures.

File Number **906.2**

Absolute Maximum Ratings

Inverse Voltage (PIV) 30V
Peak Diode -to-Substrate Voltage 30V
Peak Forward Surge Current [I_F (Surge)] 100mA
DC Forward Current (I_F) 25mA
Dissipation:
Any One Diode Unit 50mW
Total Package:
Up to 55°C 650mW
For T_A > 55°C . . . . . Derate Linearly at 6.67mW/°C
Junction Temperature . . . . . +175°C
Junction Temperature (Plastic Package) . . . . . +150°C
Lead Temperature (Soldering 10 Sec.) . . . . . +300°C

Operating Conditions

Operating Temperature Range . . . . . -55°C ≤ T_A ≤ +125°C
Storage Temperature Range . . . . . -65°C ≤ T_A ≤ +150°C

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Electrical Specifications T_A = +25°C

PARAMETERS	SYMBOL	TEST CONDITIONS		LIMITS MIN	LIMITS TYP	LIMITS MAX	UNITS
DC Forward Voltage Drop	V_F	I_F (Anode)	100µA	-	0.7	0.9	V
			1mA	-	0.78	1	V
			10mA	-	0.93	1.2	V
DC Reverse Breakdown Voltage	$V_{(BR)R}$	I_F = -10µA		30	50	-	V
DC Breakdown Voltage Between Any Diode and Substrate	$V_{(BR)DI}$	I_{DI} = 10µA		30	50	-	V
DC Reverse (Leakage) Current	I_R	V_F = -20V		-	-	100	nA
DC Reverse (Leakage) Current Between Any Diode and Substrate	I_{DI}	V_{DI} = 20V		-	-	100	nA
Magnitude of Diode Offset Voltage Between Diode Pairs		V_{DI} = 20V, I_{FA} = 1mA		-	0.55	-	mV
Temperature Coefficient of Forward Voltage Drop	$\Delta V_F/\Delta T$	I_F = 1mA		-	-1.5	-	mV/°C
Reverse Recovery Time	t_{RR}	I_F = 2mA, I_R = 2mA		-	50	-	ns
Diode Capacitance	C_D			See Figure 4			pF
Diode Anode-to-Substrate Capacitance	C_{DAI}			See Figure 5			pF
Diode Cathode-to-Substrate Capacitance	C_{DCI}			See Figure 6			pF
Magnitude of Cathode-to-Anode Current Ratio	$\|I_{FC}/I_{FA}\|$	I_{FA} = 1mA, V_{DS} = 10V		0.9	0.96	-	-

Typical Performance Curves

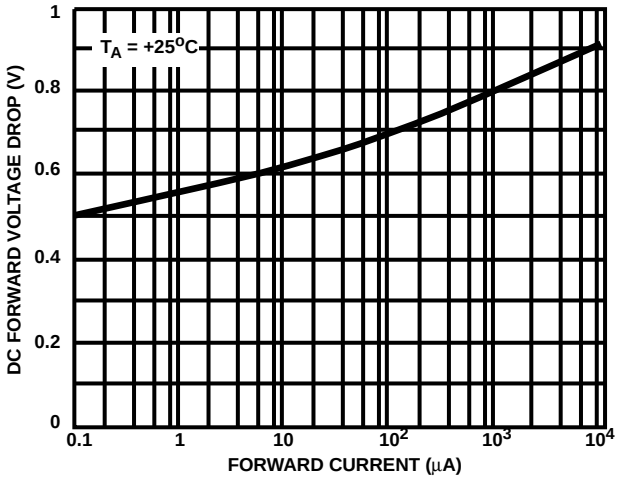


FIGURE 1. DC FORWARD VOLTAGE DROP vs FORWARD CURRENT

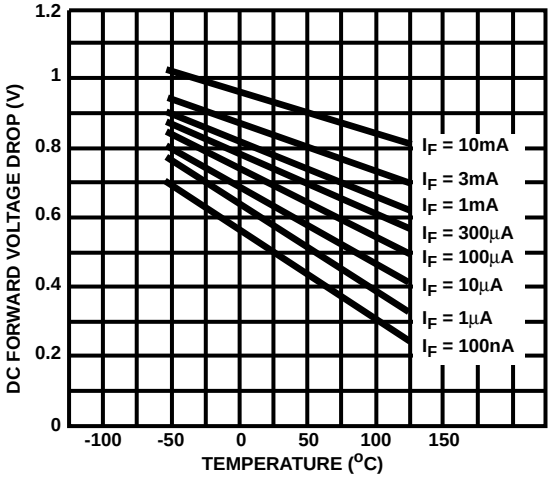


FIGURE 2. DC FORWARD VOLTAGE DROP vs TEMPERATURE

Typical Performance Curves (Continued)

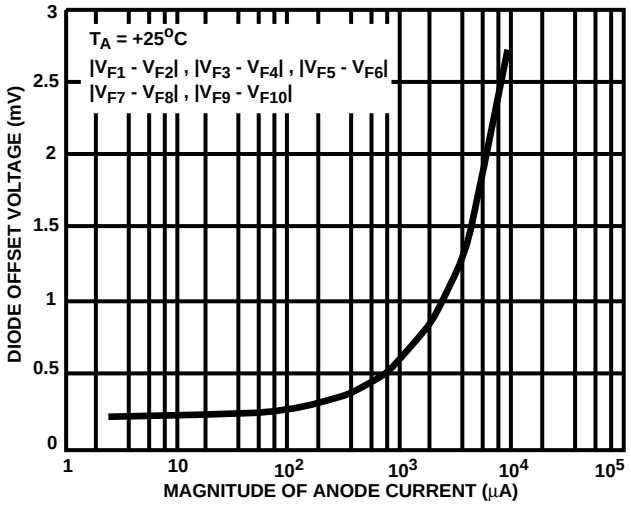


FIGURE 3. DIODE OFFSET VOLTAGE vs MAGNITUDE OF ANODE CURRENT

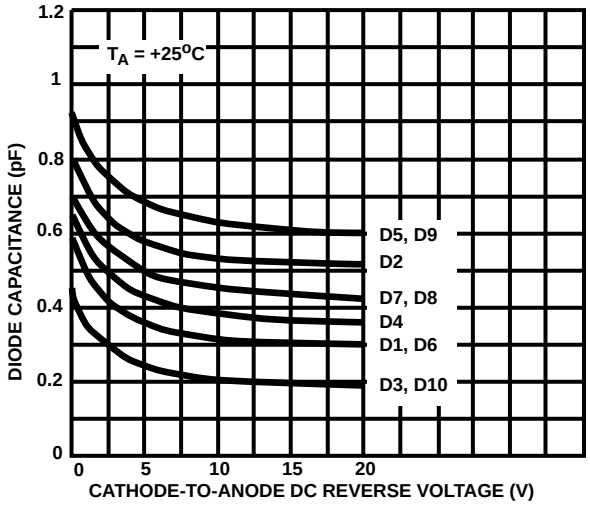


FIGURE 4. DIODE CAPACITANCE vs CATHODE-TO-ANODE REVERSE VOLTAGE

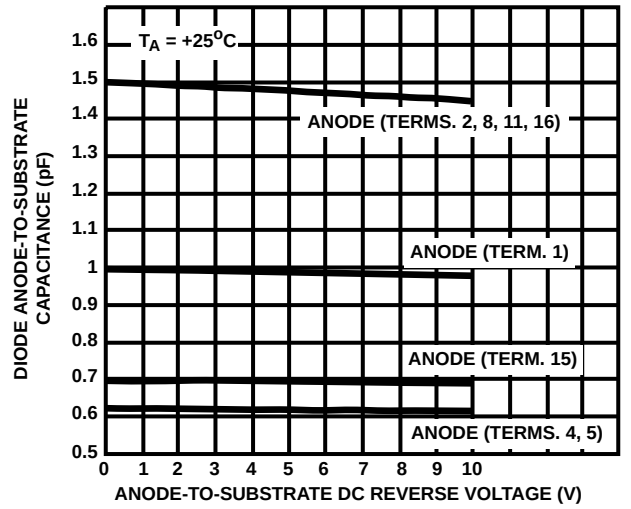


FIGURE 5. DIODE ANODE-TO-SUBSTRATE CAPACITANCE vs REVERSE VOLTAGE

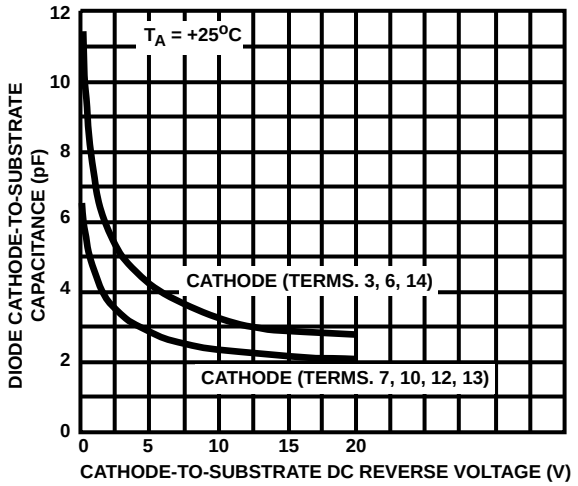


FIGURE 6. DIODE CATHODE-TO-SUBSTRATE CAPACITANCE vs CATHODE-TO-SUBSTRATE DC REVERSE VOLTAGE

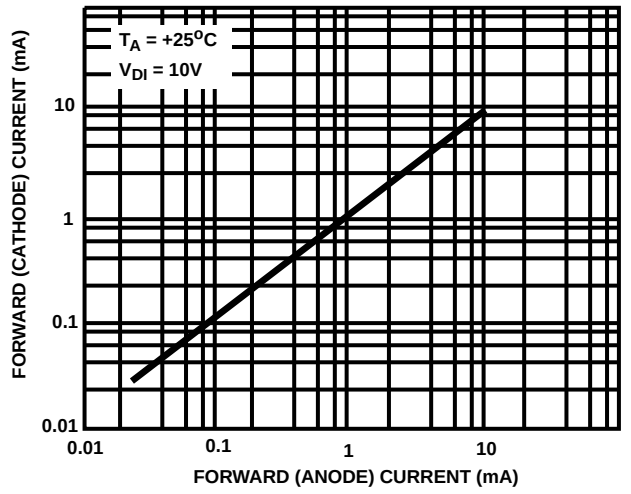


FIGURE 7. FORWARD (CATHODE) CURRENT vs FORWARD (ANODE) CURRENT

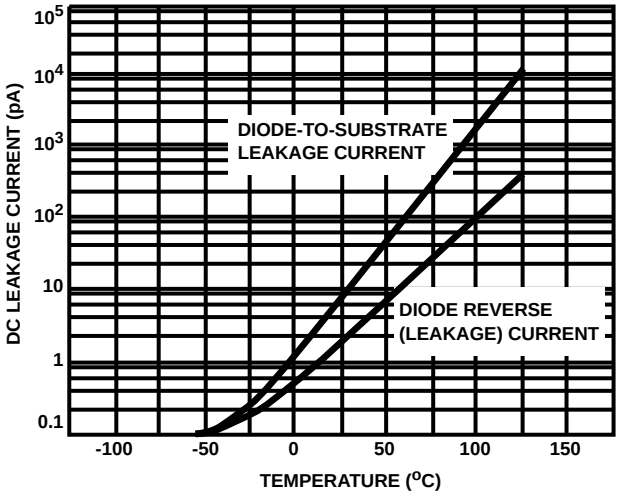


FIGURE 8. DC LEAKAGE CURRENT vs TEMPERATURE