CCSCP32N15

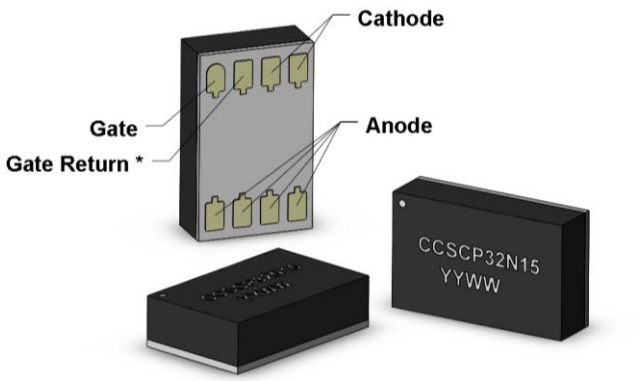
Semiconductor Discharge Switch, C-Pak

The **CCSCP32N15** is an advanced high-voltage current-controlled thyristor packaged in a **C-Pak SMT package**.

Like all Solidtron products, the internal semiconductor employs high cell density and an advanced planer termination design to achieve high peak current capability, low conduction loss, low off-state leakage, negligible turn-on delay jitter and, most importantly, extremely high turn-on di/dt capability. It is ideally suited for a wide variety capacitor discharge applications requiring precise timing and rapid energy transfer capability.

The **C-Pak** is a custom surface mount package in which the semiconductor is conventionally attached to a metalized ceramic substrate, wire bonded then encapsulated in epoxy. The C-Pak is specifically designed to be compliant with IPC 2221A Section 6.3 Electrical Clearance (any elevation).

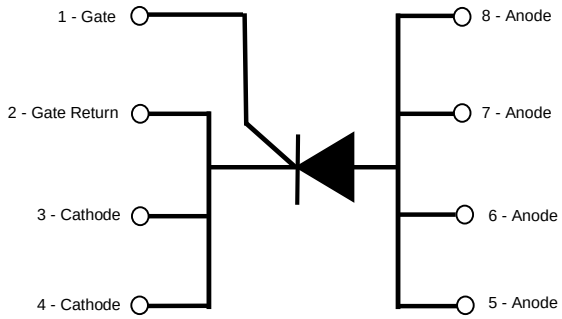
The **CCSCP32N15** is intended to replace triggered spark gaps of similar voltage and current ratings.



The **Gate Return pad provides a dedicated connection directly to the cathode of the semiconductor die. This connection consists of a single 0.010" aluminum bond wire.*

*Using the Gate Return pad as an independent gate driver return path reduces V=L*di/dt induced stress on the gate driver components.*

With CCS Solidtron devices, the Gate Return pad may, alternatively, be used as an additional Cathode pad; however, its internal connection possess only 40% of the I^2T capability of each of the other Cathode pads. Using it in this fashion must be qualified by the customer for their specific application.



KEY PRODUCT FEATURES

- 1500V Repetitive Peak Off-State Voltage
- V_{GK} = 0V = OFF
- 100kA/µSec di/dt Capability
- < 100nSec Turn-On Delay Time
- 4kA Repetitive Anode Current

MAXIMUM RATINGS	VALUE	UNITS
Peak Off-State Anode Voltage	1500	V
Repetitive Peak Forward Anode Current (**1/2 Cycle Pulse Width =/<1uSec**)	4000	A
Repetitive Peak Reverse Anode Current (**1/2 Cycle Pulse Width =/<1uSec**)	3500	A
Critical Off-State Rate of Change of Voltage (dv/dt) immunity	1000	V/uSec
Case Temperature	-55 to 125	°C
Rate of Change of Anode Current (di/dt)	100	kA/uSec
Peak Forward Gate Current (=/< 100uSec critically damped pulse)	10	A
Peak Reverse Gate Voltage	-9	V

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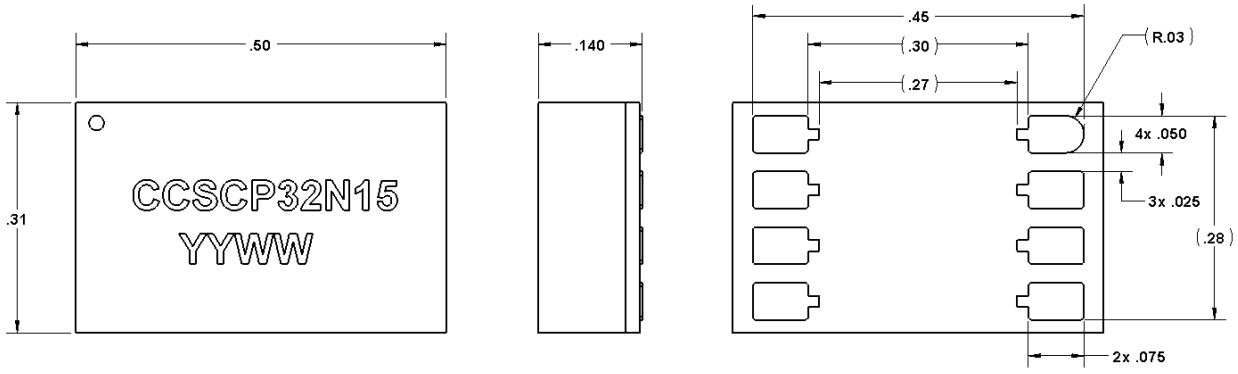
TYPICAL OPERATING CONDITIONS	VALUE	UNITS
Off-State Anode Voltage	1250	V
Repetitive Peak Forward Anode Current (**1/2 Cycle Pulse Width = 160nSec**)	2700	A
Repetitive Peak Reverse Anode Current (**1/2 Cycle Pulse Width = 160nSec**)	2200	A
Off-State Rate of Change of Voltage (dv/dt) immunity	=/<150	V/mSec
Case Temperature (T_C)	-55 to 85	^oC
Rate of Change of Anode Current (di/dt)	65	kA/µSec
Peak Forward Gate Current (<100uSec)	.5	A
Peak Reverse Gate Voltage (Incidental)	-5	V
Repetition Rate	<1	Hz

ELECTRICAL CHARACTERISTICS	CONDITIONS		VALUES	UNITS
Anode-Cathode Breakdown Voltage	Gate shorted to Cathode, I_A=100uA	T_C = -55 ^oC	Min. 1500	V
		T_C = +25 ^oC		V
		T_C = +125 ^oC		V
Anode-Cathode Off-State Current	Gate shorted to Cathode, V_{AK}=1500V	T_C = -55 ^oC	Max. 50	nA
		T_C = +25 ^oC	Max. 100	nA
		T_C = +85 ^oC	Max. 1	µA
		T_C = +125 ^oC	Max. 10	µA
Gate Trigger Voltage	V_{AK}= 12V, I_D=1mA		Typ. 0.48	V
Input Capacitance	Bias=6V, Freq. =120Hz		Typ. 13	nF
Turn-on Delay Time	Capacitor Discharge Through CVR		Typ. 50 Max. 100	nSec
Rate of Change of Anode Current (di/dt)	C=.13uF, L_{SERIES} = 20nH, V_{SUPPLY} = 1250V, R_{SERIES}=50mohms, T_C = +25 ^oC, I_G = 0.5A		Typ. 65	kA/uSec
Peak Anode Current			Typ. 2.7	kA



DATE CODE
YY = LAST 2 DIGITS OF CALENDAR YEAR
WW = WORK WEEK OF THE CALENDAR YEAR

DIMENSIONS ARE IN INCHES
TOLERANCES UNLESS OTHERWISE NOTED:
TWO PLACE DECIMAL +/-0.010 THREE PLACE DECIMAL +/-0.004

Figure 1. Critical Package Dimensions and Markings

HANDLING AND STORAGE

ESD Sensitivity

THIS DEVICE IS ESD SENSITIVE. OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC DISCHARGE SENSITIVE DEVICES IN ALL ASSEMBLY AND TEST AREAS (REF. JESD625).

IMPROPER HANDLING OF THIS DEVICE MAY PERMANENTLY DAMAGE THE DEVICE AND RENDER IT UNUSABLE.

Moisture Sensitivity

C-Pak SMD Packages have not yet been characterized in accordance with recognized MSL standards. To limit moisture absorption, **C-Pak** products are packed/shipped in a Moisture Barrier Bag (MBB) containing desiccant.

Solderability

The component pads of the **C-Pak,** *although gold plated***, are subject to oxidation** of the underlying nickel if handled or stored inappropriately**.** Prolonged exposure to circumstances known to promote nickel oxidation should be avoided; otherwise, solderability of the **C-Pak** will be compromised.

General

It is highly recommended customers qualify this product with their specific SMD storage, baking and reflow processes, equipment & materials to ensure overall satisfactory installation is achievable.

CAUTION: baking of **C-Pak SMD Packages** may cause increased oxidation of the terminations, which if excessive, can result in solderability problems during board assembly. The temperature and time for baking this SMD package should, therefore, be limited with solderability considerations in mind.

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