

$BV_{DSX}/$ $BV_{DGX}$	$R_{DS(ON)}$ (max)	$I_{DSS}$ (min)	Package
250V	10 $\Omega$	220mA	SOT-89

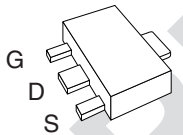
### Features

- Depletion mode device offers low  $R_{DS(ON)}$  at cold temperatures
- Low on resistance 10 ohms max. at 25°C
- High input impedance
- High breakdown voltage 250V
- Low  $V_{GS(off)}$  voltage -1.6 to -3.9V
- Small package size SOT-89

### Applications

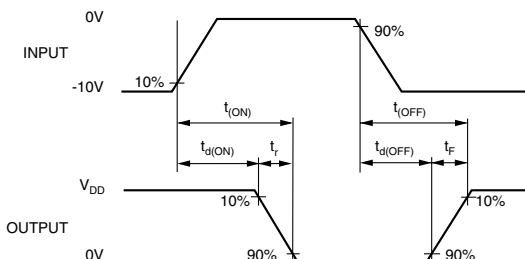
- Ignition modules
- Normally-on switches
- Solid state relays
- Converters
- Telecommunications
- Power supply

### Package Pinout



(SOT-89)

### Switching Waveform



### Description

The CPC3710C is an N-channel depletion mode field effect transistor (FET) that utilizes Clare's proprietary third generation vertical DMOS process. Third generation process realizes world class, high voltage MOSFET performance in an economical silicon gate process. Our vertical DMOS process yields a robust device for high power applications with high input impedance. The CPC3710C is a highly reliable FET device that has been used extensively in Clare's solid state relays for industrial and telecommunications applications.

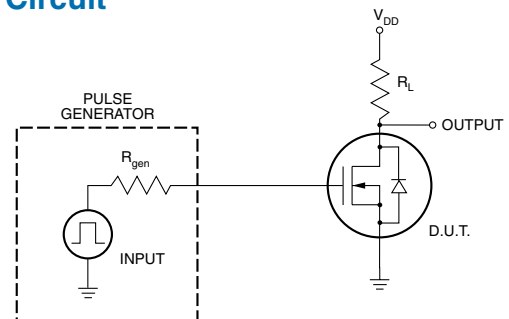
This device excels in power applications requiring low drain-source resistance, particularly in cold environments such as automotive ignition modules. The CPC3710C offers a low 10 ohm maximum on-state resistance at 25°C.

The CPC3710C has a minimum breakdown voltage of 250V and is available in an SOT-89 package. As with all MOS devices, the FET structure prevents thermal runaway and thermal-induced secondary breakdown.

### Ordering Information

Part #	Description
CPC3710C	SOT-89 (100/Tube)
CPC3710CTR	SOT-89 (2000/Reel)

### Test Circuit



## Absolute Maximum Ratings (@ 25° C)

Parameter	Ratings	Units
Drain-to-Source Voltage	250	V
Gate-to-Source Voltage	±20	V
Total Package Dissipation	1.6 <sup>1</sup>	W
Operational Temperature	-55 to +125	°C
Storage Temperature	-55 to +125	°C

<sup>1</sup> Mounted on FR4 board 1"x1"x0.062"

Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

## Electrical Characteristics

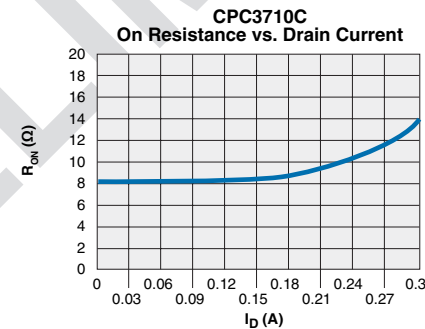
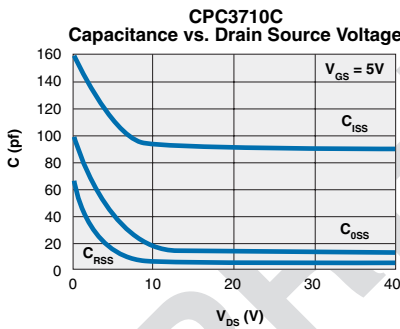
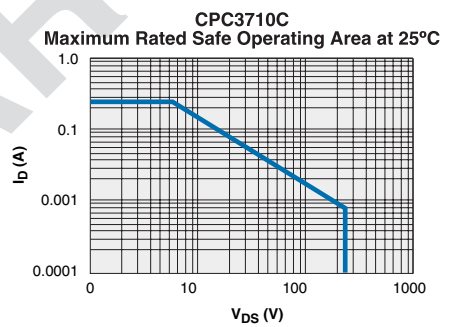
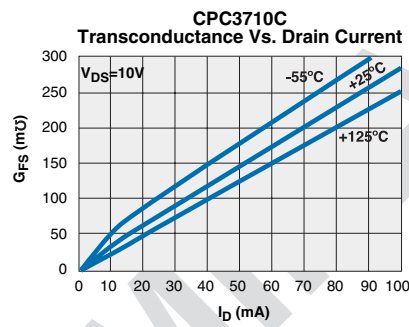
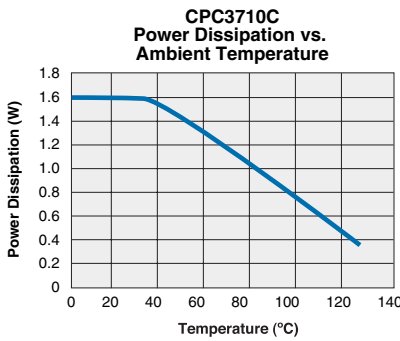
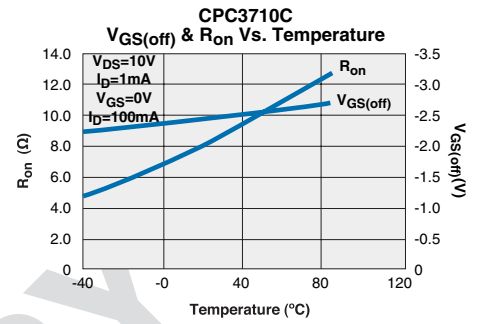
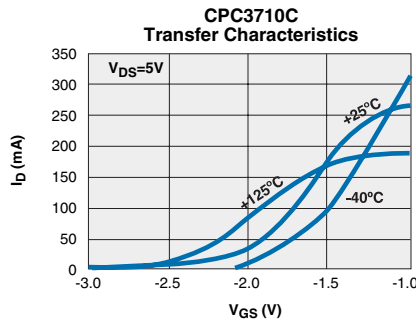
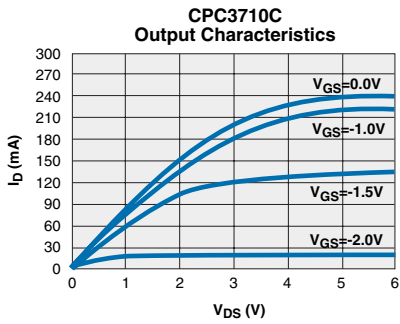
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-to-Source Breakdown Voltage	$BV_{DSX}$	$V_{GS} = -5V, I_D = 100\mu A$	250	-	-	V
Gate-to-Source Off Voltage	$V_{GS(off)}$	$V_{DS} = 10V, I_D = 1mA$	-1.6	-2.5	-3.9	V
Change in $V_{GS(off)}$ with Temperatures	$dV_{GS(off)}/dT$	$V_{DS} = 10V, I_D = 1mA$	-	-	3.3	mV/°C
Gate Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	100	nA
Drain-to-Source Leakage Current	$I_{D(off)}$	$V_{GS} = -5V, V_{DS} = \text{Max Rating}$	-	-	1	$\mu A$
		$V_{GS} = -5V, V_{DS} = 0.8 \text{ Max Rating } T_A = 125^\circ C$	-	-	1	mA
Saturated Drain-to-Source Current	$I_{DSS}$	$V_{GS} = 0V, V_{DS} = 15V$	220	-	-	mA
Static Drain-to-Source ON-State Resistance	$R_{DS(on)}$	$V_{GS} = 0V, I_D = 220mA$	-	-	10	$\Omega$
Change in RDS(on) with Temperatures	$dR_{DS(on)}/dT$	$V_{GS} = 0V, I_D = 220mA$	-	-	0.86	%/°C
Forward Transconductance	$G_{FS}$	$I_D = 100mA, V_{DS} = 10V$	225	-	-	$m\Omega$
Input Capacitance	$C_{ISS}$	$V_{GS} = -5V$ $V_{DS} = 25V$ $f = 1MHz$	-	100	350	pF
Common Source Output Capacitance	$C_{OSS}$		-	30	80	
Reverse Transfer Capacitance	$C_{RSS}$		-	15	40	
Turn-ON Delay Time	$t_{d(on)}$	$V_{DD} = 25V$ $I_D = 150mA$ $V_{GS} = 0V \text{ to } -10V$ $R_{GEN} = 50\Omega$	-	23	35	ns
Rise Time	$t_r$		-	8	20	
Turn-OFF Delay Time	$t_{d(off)}$		-	17	25	
Fall time	$t_f$		-	70	80	
Source-Drain Diode Voltage Drop	$V_{SD}$	$V_{GS} = -5V, I_{SD} = 150mA$	-	0.6	1.8	V

## Thermal Characteristics

Package	$I_D$ (continuous)	$I_D$ (pulsed)	Power Dissipation @ $T_A = 25^\circ C$	$\theta_{jc}$ °C/W	$I_{DR}$	$I_{DRM}$
SOT-89	220mA	600mA	1.6W <sup>1</sup>	15	220mA	600mA

<sup>1</sup> Mounted on FR4 board 1"x1"x0.062"

**PERFORMANCE DATA\***



\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

## Manufacturing Information

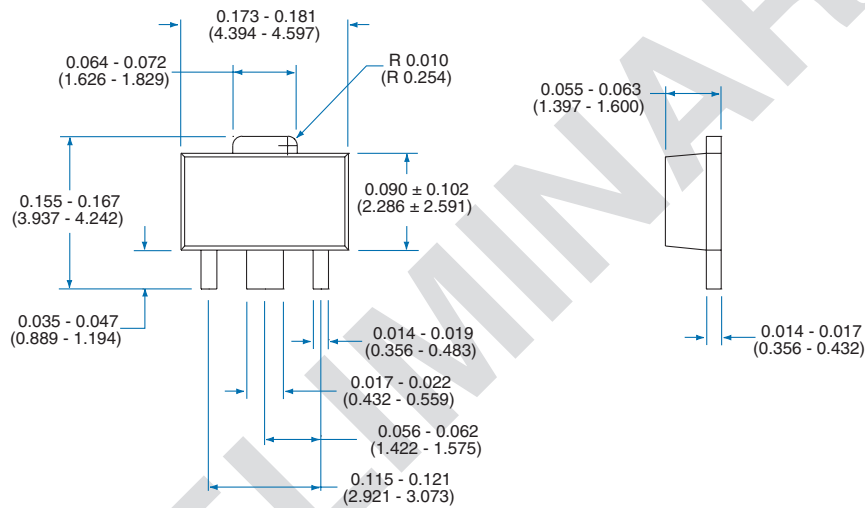
### Soldering

Recommended soldering processes are limited to 220°C component body temperature for 10 seconds.

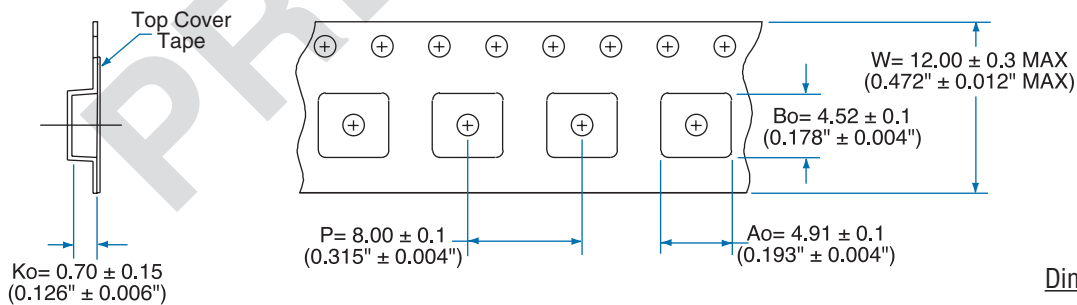
### Washing

Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

## MECHANICAL DIMENSIONS



### Tape and Reel Information



Dimensions:  
mm  
(inches)

For additional information please visit our website at: [www.clare.com](http://www.clare.com)

Clare, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this publication and reserves the right to make changes to specifications and product descriptions at any time without notice. Neither circuit patent licenses nor indemnity are expressed or implied. Except as set forth in Clare's Standard Terms and Conditions of Sale, Clare, Inc. assumes no liability whatsoever, and disclaims any express or implied warranty, relating to its products including, but not limited to, the implied warranty of merchantability, fitness for a particular purpose, or infringement of any intellectual property right.

The products described in this document are not designed, intended, authorized or warranted for use as components in systems intended for surgical implant into the body, or in other applications intended to support or sustain life, or where malfunction of Clare's product may result in direct physical harm, injury, or death to a person or severe property or environmental damage. Clare, Inc. reserves the right to discontinue or make changes to its products at any time without notice.