CPC3714C
N-Channel Depletion-Mode Vertical DMOS FETs

BV_{DSX}/ BV_{DGX}	$R_{DS(ON)}$ (max)	I_{DSS} (min)	Package
350V	14Ω	240mA	SOT-89

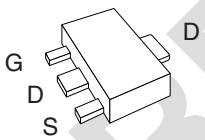
Features

- Depletion mode device offers low $R_{DS(ON)}$ at cold temperatures
- Low on resistance 14 ohms max. at 25ºC
- High input impedance
- High breakdown voltage 350V
- 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)

Description

The CPC3714C 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 CPC3714C is a highly reliable FET device that has been used extensively in Clare's solid state relays for industrial and telecommunications applications.

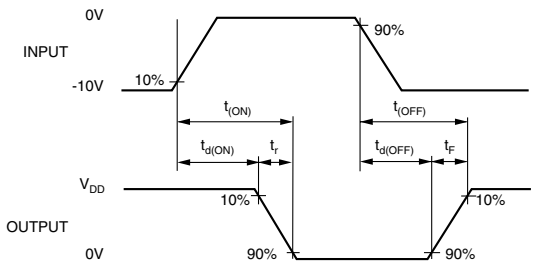
This device excels in power applications requiring low drain-source resistance, particularly in cold environments such as automotive ignition modules. The CPC3714C offers a low 14 ohm maximum on-state resistance at 25ºC.

The CPC3714C has a minimum breakdown voltage of 350V and is available in an SOT-89 package. As with all MOS devices, the FET structure prevents thermal runaway and thermal-induced secondary breakdown.

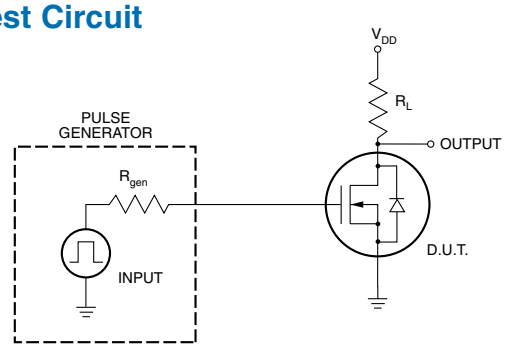
Ordering Information

Part #	Description
CPC3714C	SOT-89 (100/Tube)
CPC3714CTR	SOT-89 (2000/Reel)

Switching Waveform



Test Circuit



Absolute Maximum Ratings (@ 25˚ C)

Parameter	Ratings	Units
Drain-to-Source Voltage	350	V
Gate-to-Source Voltage	±20	V
Total Package Dissipation	1.6[1]	W
Operational Temperature	-55 to +125	ºC
Storage Temperature	-55 to +125	ºC

1 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=100µA	350	-	-	V
Gate-to-Source Off Voltage	$V_{GS(off)}$	I_{DS}= 15V, I_D=1mA	-1.6	-	-3.9	V
Change in $V_{GS(off)}$ with Temperatures	$d_{VGS(off)}/dT$	V_{DS}= 15V, I_D=1mA	-	-	4.5	mV/ºC
Gate Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	100	nA
Drain-to-Source Leakage Current	$I_{D(off)}$	V_{GS}= -5V, V_{DS}=Max Rating	-	-	1	µA
		V_{GS}= -5V, V_{DS}=0.8 Max Rating T_A=125ºC	-	-	1	mA
Saturated Drain-to-Source Current	I_{DSS}	V_{GS}= 0V, V_{DS}=15V	240	-	-	mA
Static Drain-to-Source ON-State Resistance	$R_{DS(on)}$	V_{GS}= 0V, I_D=240mA	-	-	14	Ω
Change in RDS(on) with Temperatures	$dR_{DS(on)}/dT$	V_{GS}= 0V, I_D=240mA	-	-	1.1	%/ºC
Forward Transconductance	G_{FS}	I_D= 100mA, V_{DS} = 10V	225	-	-	m℧
Input Capacitance	C_{ISS}	V_{GS}= -5V V_{DS}= 25V f= 1Mhz	-	45	100	pF
Common Source Output Capacitance	C_{OSS}			10	60	
Reverse Transfer Capacitance	C_{RSS}			2	40	
Turn-ON Delay Time	$t_{d(on)}$	V_{DD}= 25V I_D= 150mA V_{GS}= 0V to -10V R_{GEN}= 50Ω	-	20	-	ns
Rise Time	t_r			10		
Turn-OFF Delay Time	$t_{d(off)}$			20		
Fall time	t_f			50		
Source-Drain Diode Voltage Drop	V_{SD}	V_{GS}= -5V, I_{SD}= 150mA	-	0.6	1.8	V

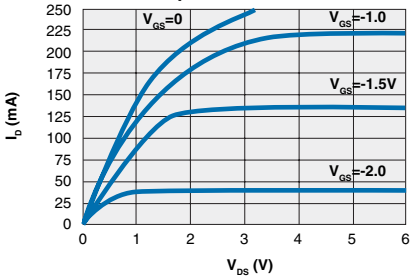
Thermal Characteristics

Package	I_D (continuous)	I_D (pulsed)	Power Dissipation @TA=25ºC	θ_{ic} °C/W	I_{DR}	I_{DRM}
SOT-89	240mA	600mA	1.6W[1]	15	240mA	600mA

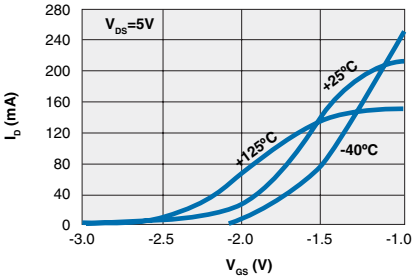
1 Mounted on FR4 board 1"x1"x0.062"

PERFORMANCE DATA*

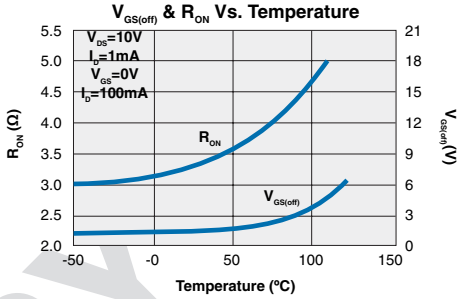
CPC3714C
Output Characteristics



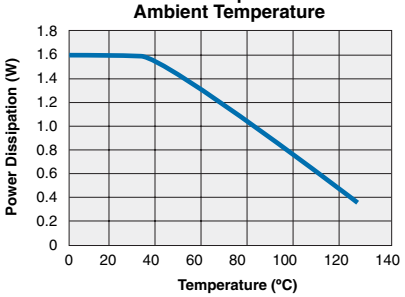
CPC3714C
Transfer Characteristics



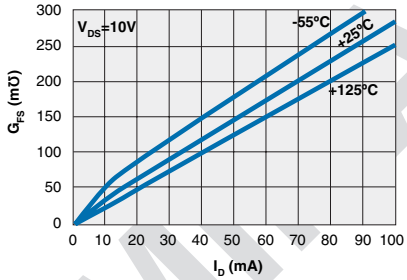
CPC3714C
$V_{GS(off)}$ & R_{ON} Vs. Temperature



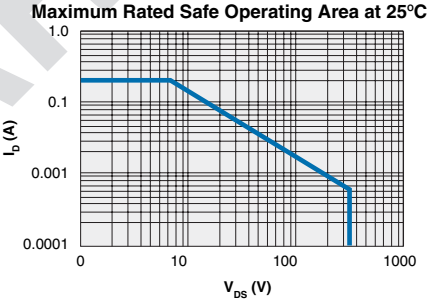
CPC3714C
Power Dissipation vs.
Ambient Temperature



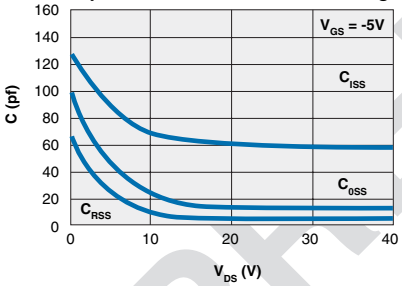
CPC3714C
Transconductance Vs. Drain Current



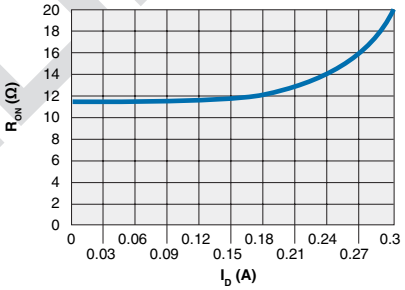
CPC3714C
Maximum Rated Safe Operating Area at 25°C



CPC3714C
Capacitance vs. Drain Source Voltage



CPC3714C
On Resistance vs. Drain Current



*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

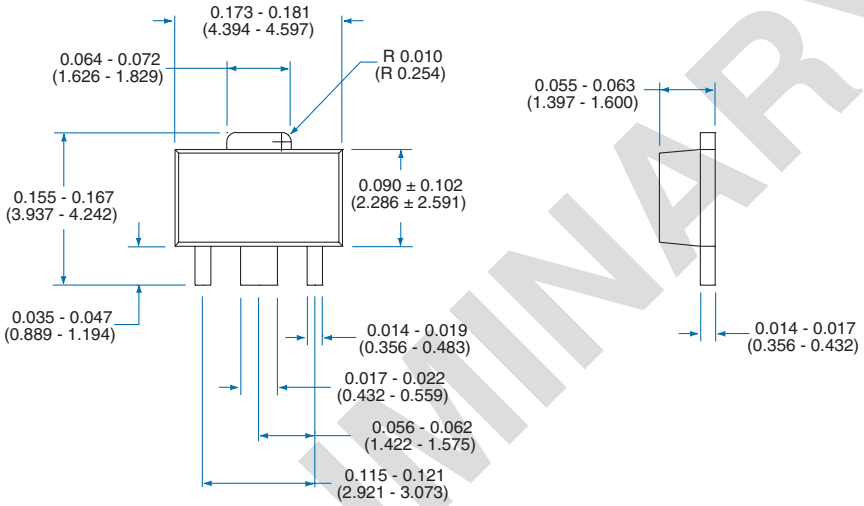
Soldering

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

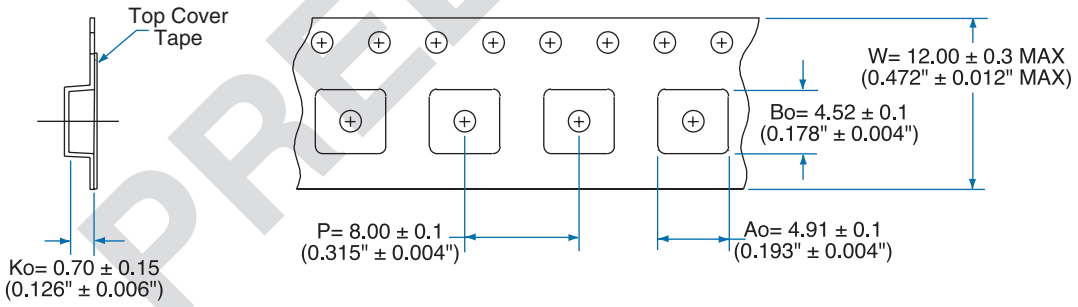
Washing

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

Specification: DS-CPC3714C-R00A.5

6/13/05