

**General Description**

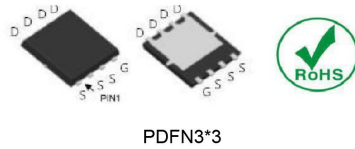
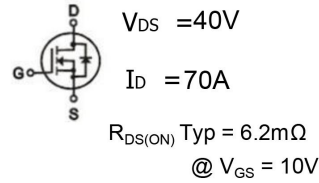
The CH70N04N combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

**Features**

- Advance high cell density Trench technology
- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

**Application**

- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

**Product Summary**

**Ordering Information:**

Part NO.	CH70N04N
Marking	CH70N04N
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

**Absolute Maximum Ratings ( $T_c = 25^\circ C$ )**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	20	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	70	A
	$I_{D@TC=75^\circ C}$	50	A
	$I_{D@TC=100^\circ C}$	36	A
Pulsed Drain Current (1)	$I_{DM}$	240	A
Total Power Dissipation( $TC=25^\circ C$ )	$P_D@TC=25^\circ C$	48	W
Total Power Dissipation( $TA=25^\circ C$ )	$P_D@TA=25^\circ C$	2.0	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy@L=0.1mH	$E_{AS}$	72	mJ
Avalanche Current@L=0.1mH	$I_{AS}$	55	A

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	$R_{thJC}$	-	-	2.6	$^{\circ}C/W$
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	62.5	$^{\circ}C/W$
Soldering temperature, wavesoldering for 10s	$T_{sold}$	-	-	265	$^{\circ}C$

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	40			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1	1.5	2.0	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$			1.0	$\mu A$
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$			$\pm 100$	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$		6.2	7.5	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$		7.9	10	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=15V, I_D=10A$		16		S
Source-drain voltage	$V_{SD}$	$I_S=20A$			1.50	V

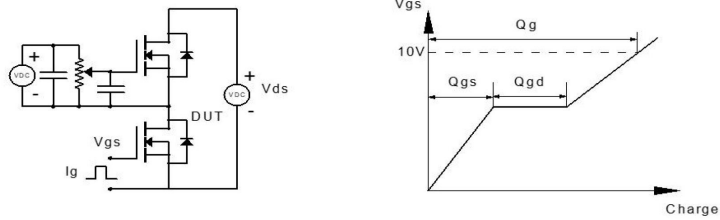
**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	$C_{iss}$	f = 1MHz	-	3177	-	pF
Output capacitance	$C_{oss}$		-	150	-	
Reverse transfer capacitance	$C_{rss}$		-	133	-	

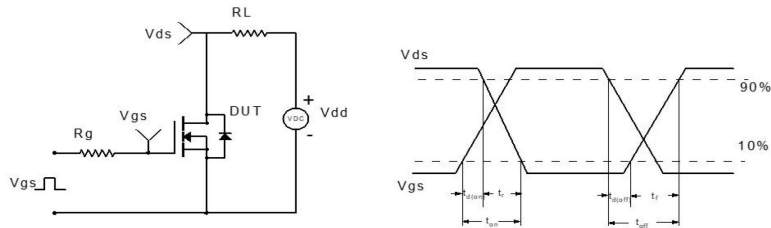
**•Gate Charge characteristics( $T_a = 25^{\circ}C$ )**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	$Q_g$	$V_{DS}=20V$ $I_D=20A$ $V_{GS}=0V$ TO 10V	-	45	-	nC
Gate - Source charge	$Q_{gs}$		-	8	-	
Gate - Drain charge	$Q_{gd}$		-	11	-	

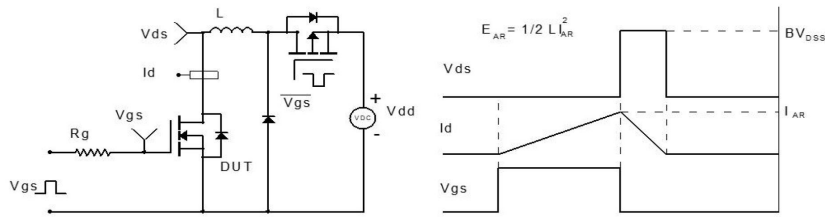
- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
  2.  $E_{AS}$  condition: Starting  $T_J=25^{\circ}C$ ,  $V_{DS}=20V$ ,  $V_G=10V$ ,  $R_G=25\Omega$ ,  $L=0.5mH$ ,  $I_{AS}=17A$
  3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$ .



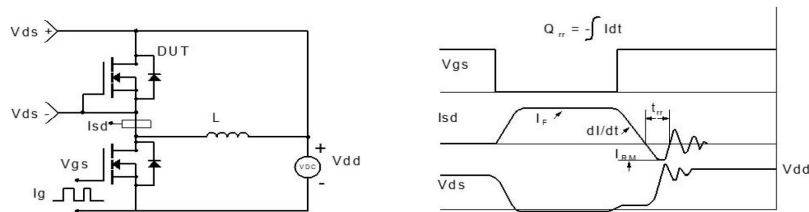
**Figure 1: Gate Charge Test Circuit & Waveform**



**Figure 2: Resistive Switching Test Circuit & Waveform**



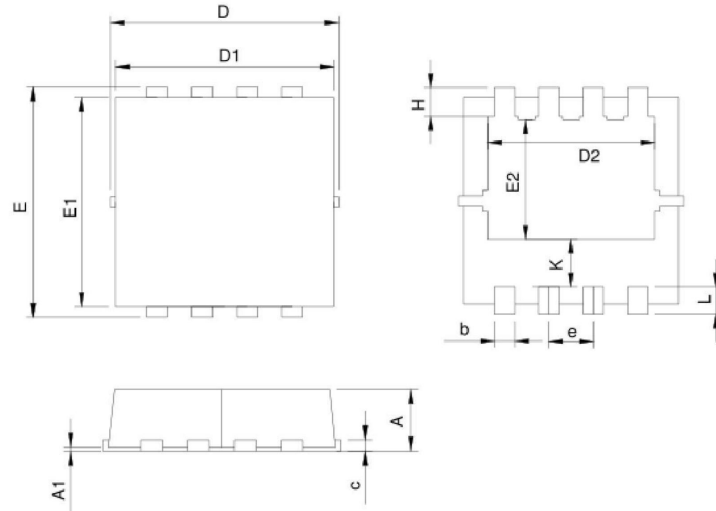
**Figure 3: Unclamped Inductive Switching Test Circuit & Waveform**



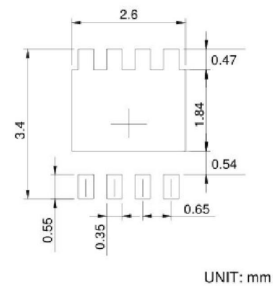
**Figure 4: Diode Recovery Test Circuit & Waveform**

**•Dimensions(DFN3×3)**

Unit: mm



L C O D E	DFN3.3x3.3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.14	0.20	0.006	0.008
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.55	0.093	0.100
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.84	0.065	0.072
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

**RECOMMENDED LAND PATTERN**


UNIT: mm