

• General Description

The combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• 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

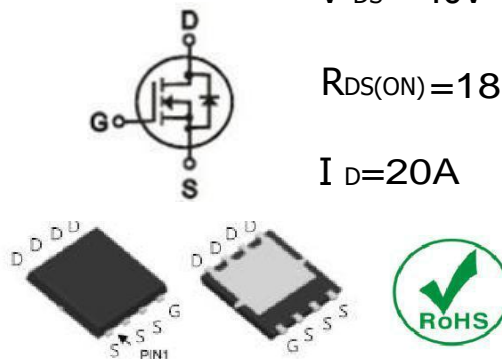
- Load Switches
- DC/DC
- BLDC Motor driver

• Product Summary

$V_{DS} = 40V$

$R_{DS(ON)} = 18m\Omega$

$I_D = 20A$



DFN3*3

• Ordering Information:

Part NO.	CH30N04N
Marking	CH30N04N
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	$I_D @ T_C = 25^\circ C$	20	A
	$I_D @ T_C = 75^\circ C$	15	A
	$I_D @ T_C = 100^\circ C$	12.6	A
Pulsed Drain Current ^①	I_{DM}	40	A
Total Power Dissipation ^②	P_D	1.5	W
Total Power Dissipation ($T_A = 25^\circ C$)	$P_D @ T_A = 25^\circ C$	0.7	W
Operating Junction Temperature	T_J	-55 to 150	$^\circ C$
Storage Temperature	T_{STG}	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy	E_{AS}	5	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case ^②	R _{thJC}	-	-	80	°C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	180	°C/W
Soldering temperature, wavesoldering for 10s	T _{sold}	-	-	265	°C

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250uA	40			V
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = -250uA	1.0	1.6	2.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V			1.0	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} = ±12V, V _{DS} = 0V			±100	nA
Static Drain-source On Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 1A		18	23	mΩ
		V _{GS} = 4.5V, I _D = 1A		28	38	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 2A		10		s
Source-drain voltage	V _{SD}	I _S = 6A			1.28	V

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz	-	1232	-	pF
Output capacitance	C _{oss}		-	152	-	
Reverse transfer capacitance	C _{rss}		-	135	-	

•Gate Charge characteristics(T_a = 25°C)

Parameter	Symbol	Condition	Min	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} = 30V	-	25	-	nC
Gate - Source charge	Q _{gs}	I _D = 15A	-	4.5	-	
Gate - Drain charge	Q _{gd}	V _{GS} = 10V	-	6.5	-	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

Figure 1: Output Characteristics

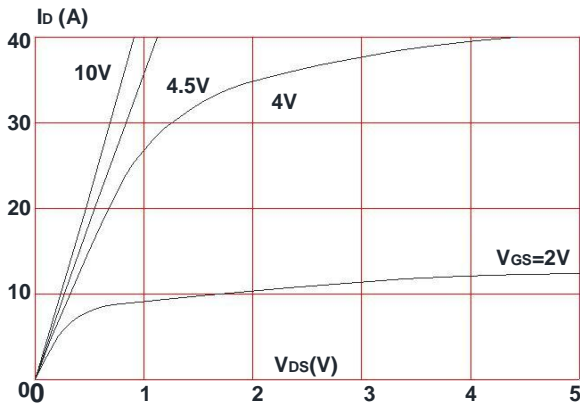


Figure 2: Typical Transfer Characteristics

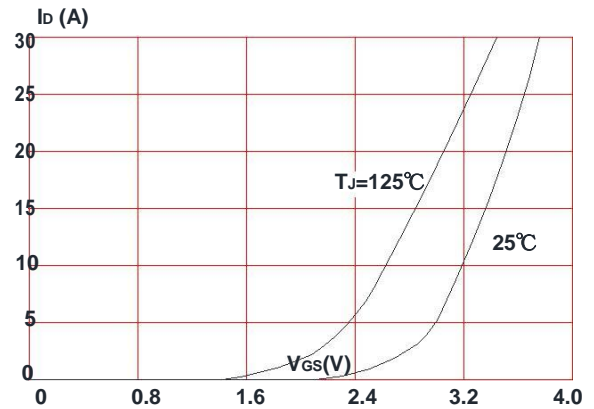


Figure 3: On-resistance vs. Drain Current

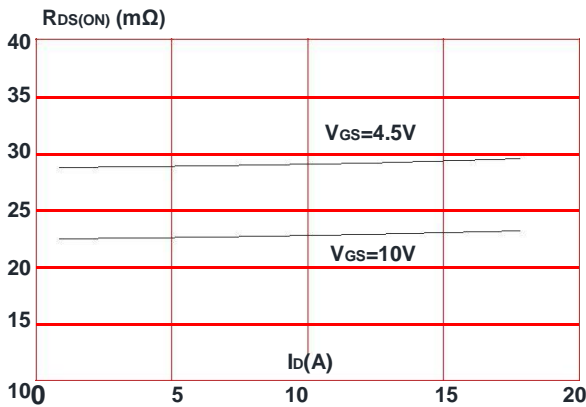


Figure 4: Body Diode Characteristics

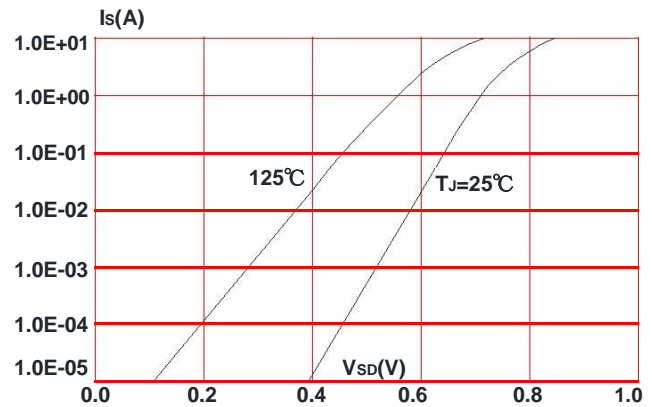


Figure 5: Gate Charge Characteristics

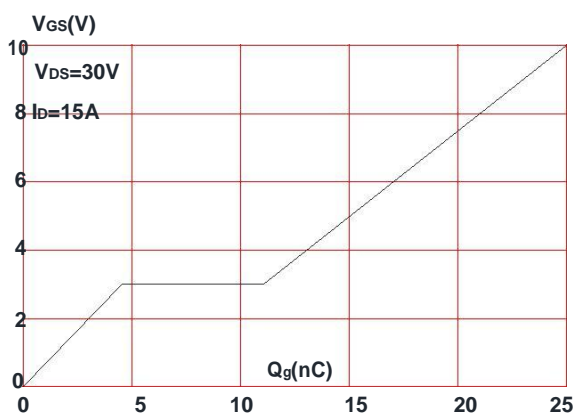


Figure 6: Capacitance Characteristics

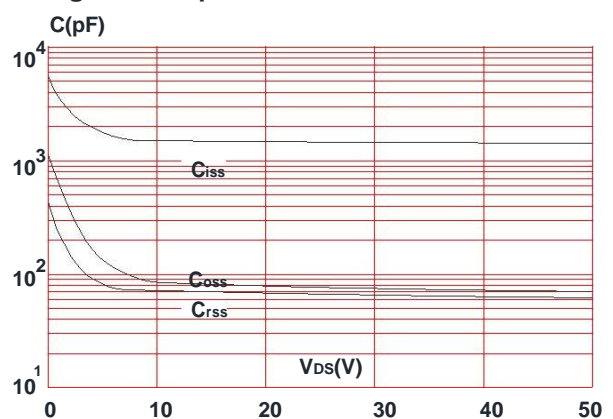


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

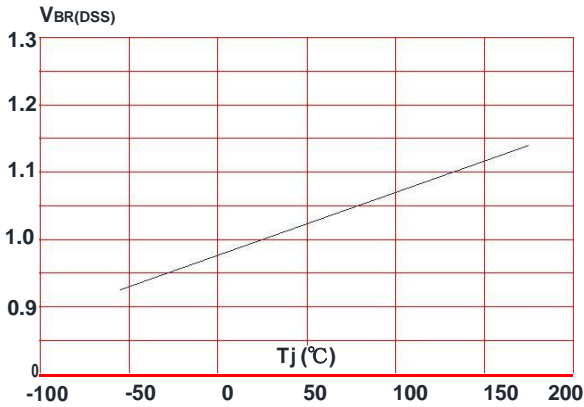


Figure 8: Normalized on Resistance vs. Junction Temperature

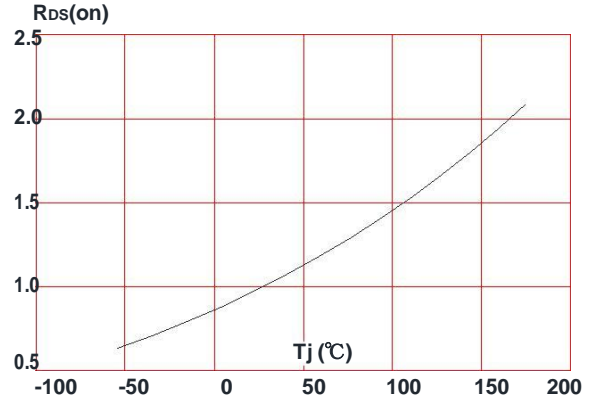


Figure 9: Maximum Safe Operating Area

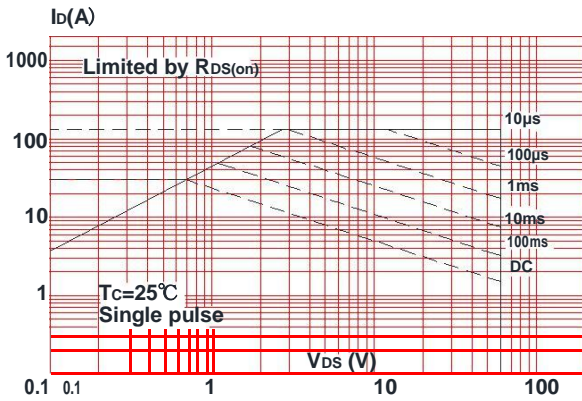


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

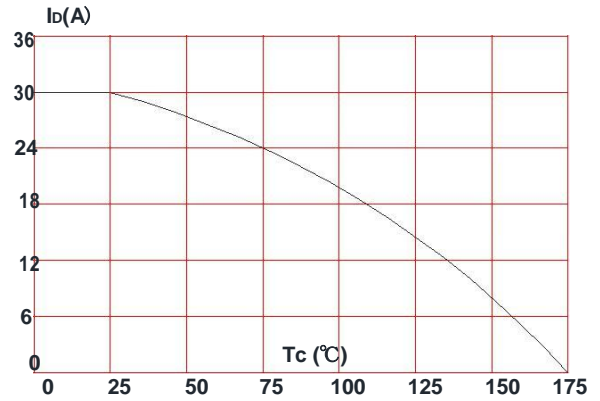
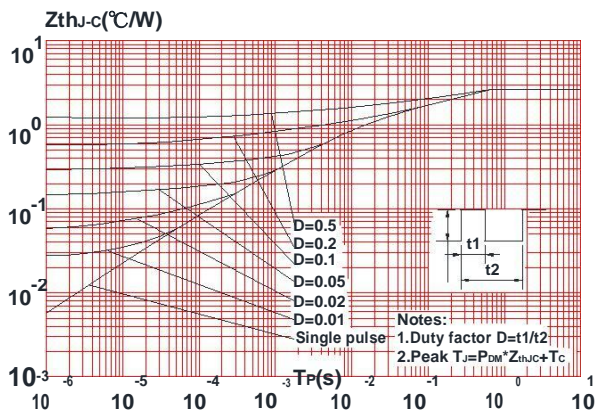


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

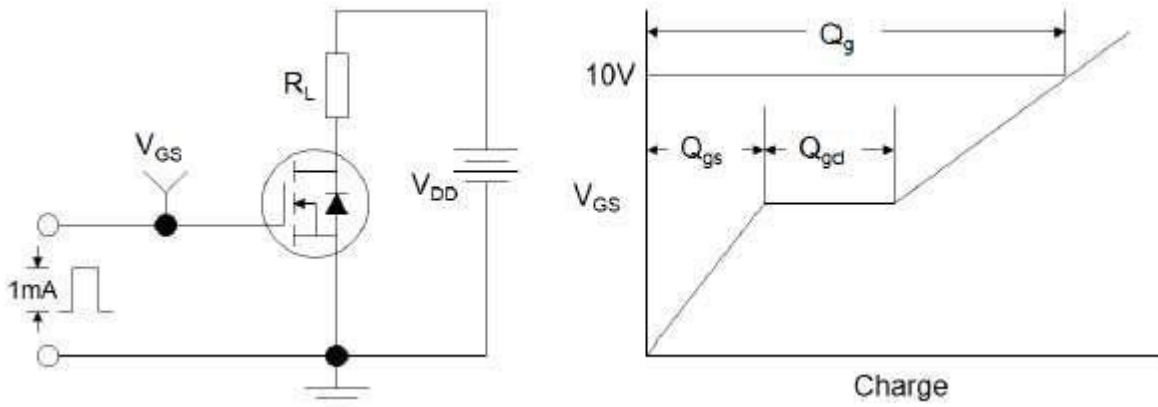


Figure 1: Gate Charge Test Circuit & Waveform

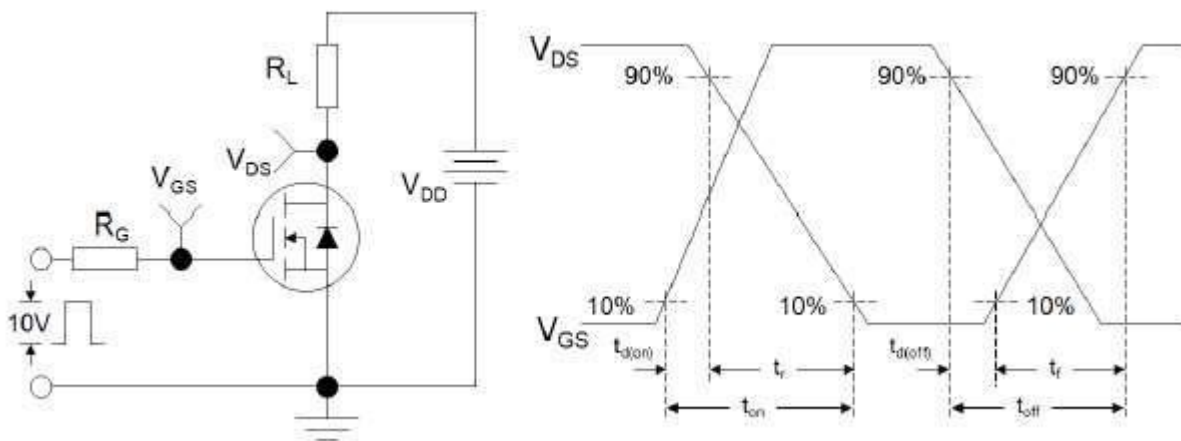


Figure 2: Resistive Switching Test Circuit & Waveforms

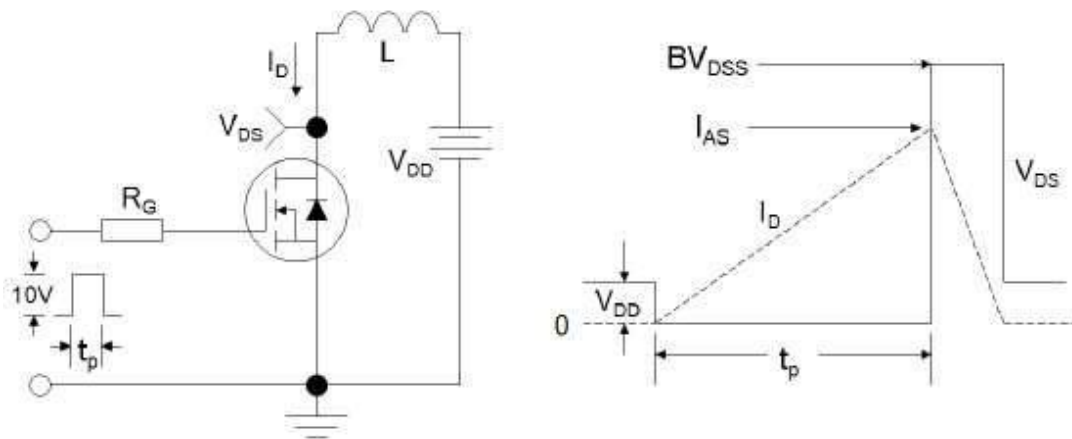
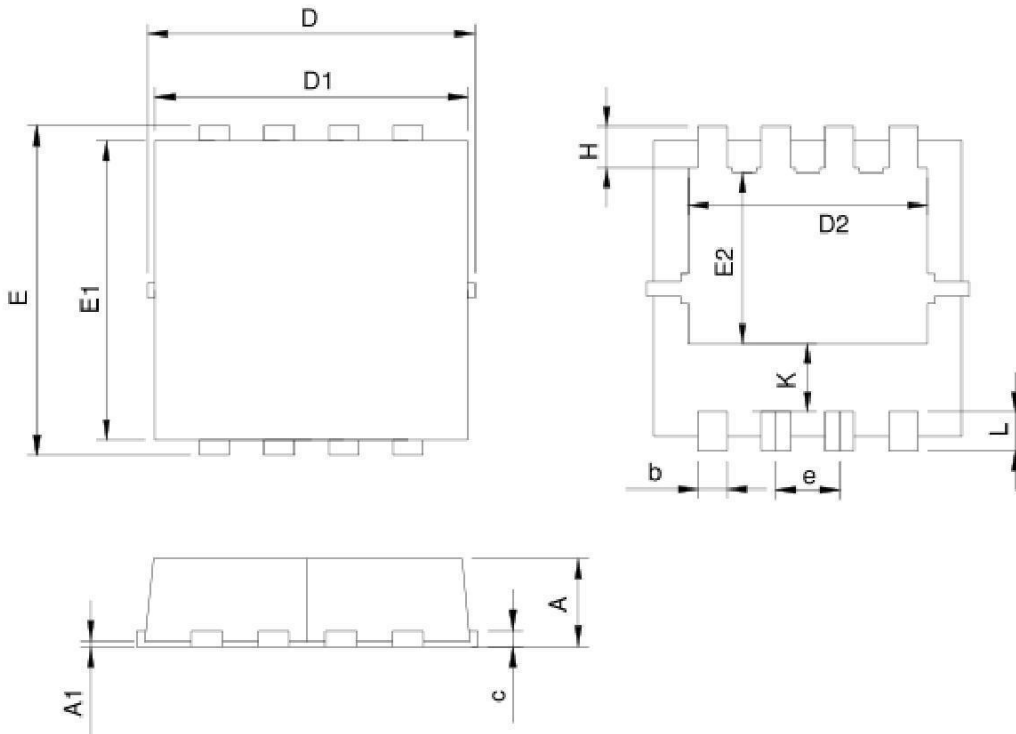


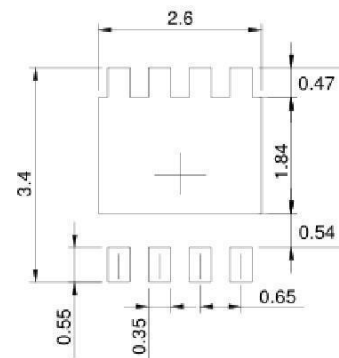
Figure 3: Unclamped Inductive Switching Test Circuit & Waveforms

•Dimensions(DFN3×3)

Unit: mm



SYMBOL	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