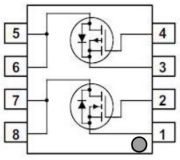
• General Description

It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. It combines one N channel MOSFET and one P channel MOSFET.

• Product Summary

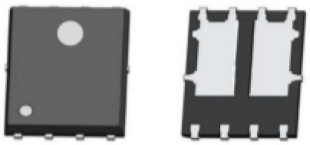


V_{DS1} =40V
V_{DS2} =-40V
$R_{DS(ON)1}$ =14mΩ
$R_{DS(ON)2}$ =-27mΩ
I_{D1} =30A
I_{D2} =-20A

• Features

- ■ Advance high cell density Trench technology
- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■ Dual DIE in one package

RoHS



DFN5*6

•Application

- ■ Power Management in Notebook Computer
- ■ BLDC Motor driver

•Ordering Information:

Part NO.	CH30NP04SN
Marking	CH30NP04SN
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	8.0	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	62	° C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	° C

•N Channel Absolute Maximum Ratings (T_C =25℃)

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℃	30	A
	I_D@T_C =75℃	20	A
	I_D@T_C=100℃	15	A

Pulsed Drain Current ①	I_{DM}	80	A
Total Power Dissipation	P_D@T_C=25℃	16	W
Total Power Dissipation	P_D@T_A=25℃	2.0	W
Operating Junction Temperature	T_J	-55 to 175	℃
Storage Temperature	T_{STG}	-55 to 175	℃
Single Pulse Avalanche Energy	E_{AS}	25	mJ

•P Channel Absolute Maximum Ratings (T_C =25℃)

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℃	-20	A
	I_D@T_C =75℃	-15	A
	I_D@T_C=100℃	-10	A
Pulsed Drain Current ①	I_{DM}	-60	A
Total Power Dissipation	P_D@T_C=25℃	13	W
Total Power Dissipation	P_D@T_A=25℃	3.0	W
Operating Junction Temperature	T_J	-55 to 175	℃
Storage Temperature	T_{STG}	-55 to 175	℃
Single Pulse Avalanche Energy	E_{AS}	35	mJ

•N Channel 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	1.5	2.0	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS} =0V			1.0	uA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS} =0V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	VGS=10V, ID=10A		14	18	mΩ
		VGS=4.5V, ID=8A		17.8	19	mΩ
Forward Trans conductance	g_{FS}	V_{DS} =25V, I_D=30A		15		s
Source-drain voltage	V_{SD}	Is=23A			1.20	V

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit

Input capacitance	Ciss	f = 1MHz V_{DS}=20V	-	668	-	pF
Output capacitance	Coss		-	98	-	
Reverse transfer capacitance	Crss		-	86	-	
Total gate charge	Qg	V_{DD} = 20V I_D = 10A V_{GS} = 10V	-	20.6	-	nC
Gate - Source charge	Qgs		-	3.2	-	
Gate - Drain charge	Qgd		-	4.8	-	

•P Channel 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	-2.2	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-30V, V_{GS} =0V			1.0	uA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS} =0V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=--15A		28	33	mΩ
		V_{GS}=-4.5V, I_D=-7A		34	49	mΩ
Forward Transconductance	g_{FS}	V_{DS} =-10V, I_D=-5A		15		s

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz V_{DS}=-20V	-	1512	-	pF
Output capacitance	Coss		-	115	-	
Reverse transfer capacitance	Crss		-	104	-	
Total gate charge	Qg	V_{DD} = -20V I_D = -8A V_{GS} = -10V	-	27.6	-	nC
Gate - Source charge	Qgs		-	4.4	-	
Gate - Drain charge	Qgd		-	5.4	-	

●N Channel characteristics curve

Fig 1 Output Characteristics

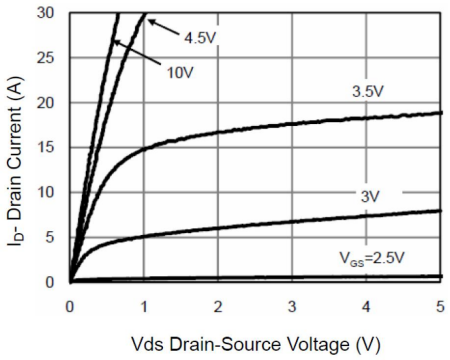


Fig.2 **Transfer Characteristics**

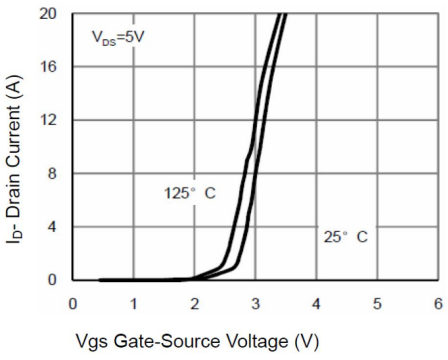


Fig.3 **Drain-Source On-Resistance**

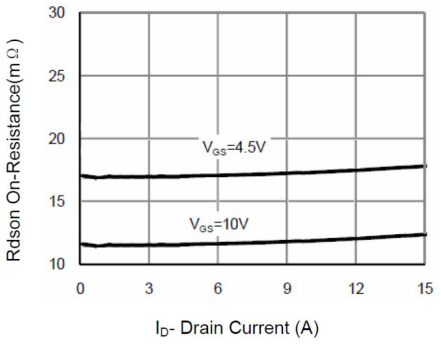


Fig. 4 **Drain-Source On-Resistance**

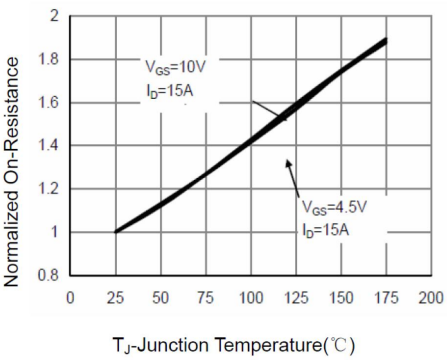


Fig.5 Rdson vs Vgs

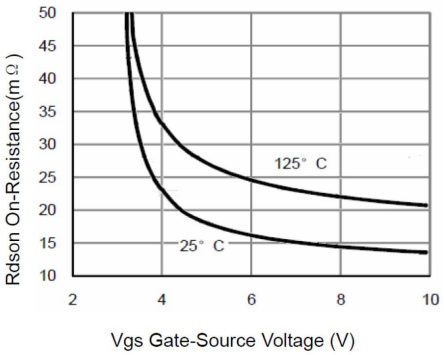
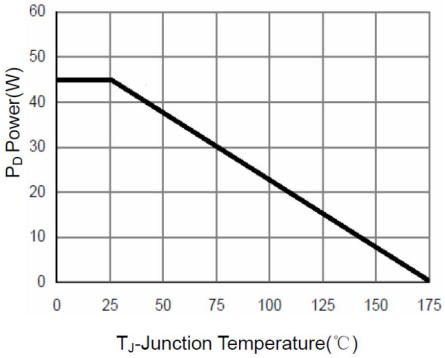


Fig. 6 **Power Dissipation**



●N Channel characteristics curve

Fig.7 **Gate Charge**

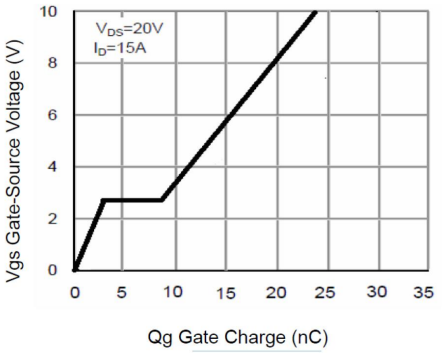


Fig. 8 **Source- Drain Diode Forward**

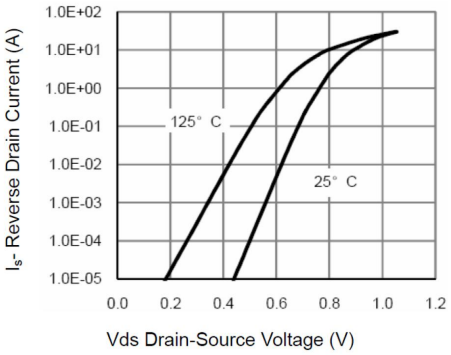
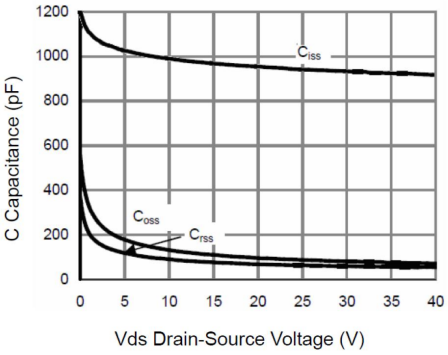


Fig.9 **Capacitance vs Vds**



●N Channel characteristics curve

Fig.10 Safe Operating Area

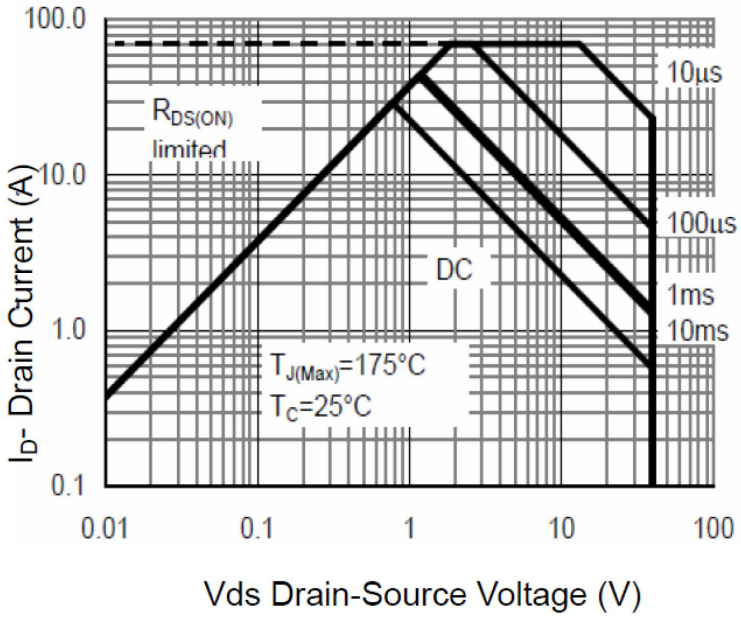
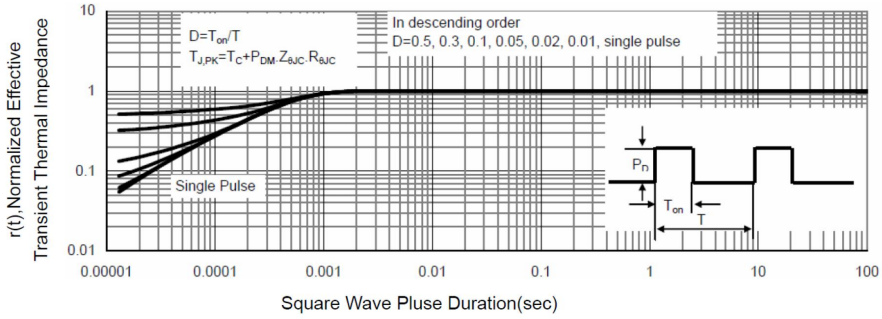


Fig. 11 Transient Thermal Response Curve



●P Channel characteristics curve

Typical Performance Characteristics

Fig.1 On-Region Characteristics

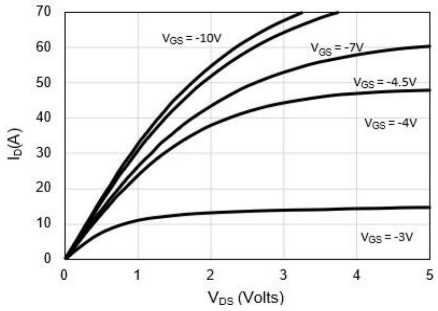


Fig.2 Transfer Characteristics

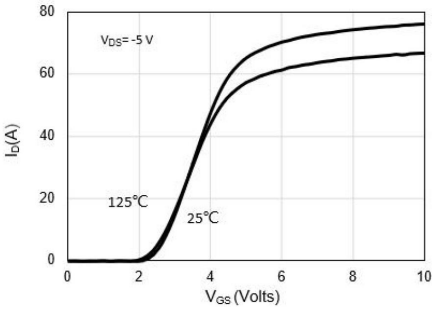


Figure.3 On-Resistance vs. Drain Current and Gate Voltage

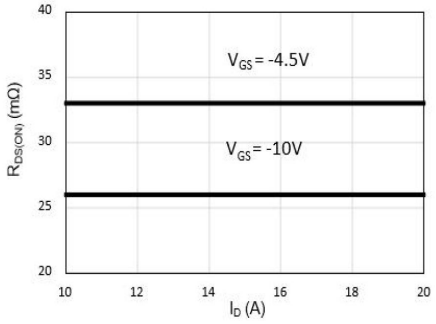


Fig. 4 On-Resistance vs. Junction Temperature

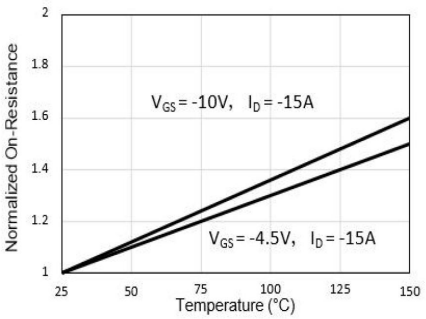


Figure 5 Body-Diode Characteristics

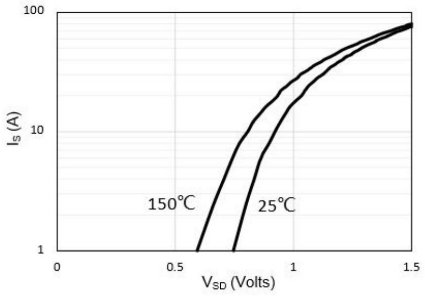
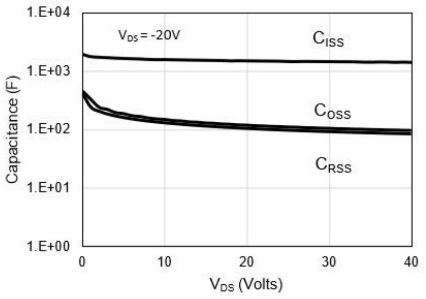


Fig. 6 Capacitance Characteristics



●P Channel characteristics curve

Fig.7 Gate-Charge Characteristics

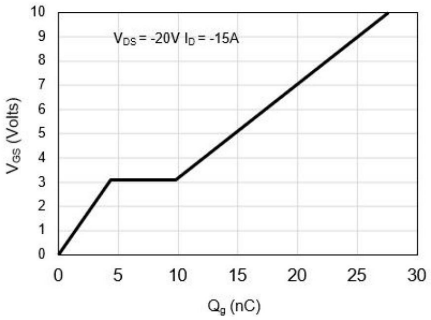


Fig. 8 Power De-rating

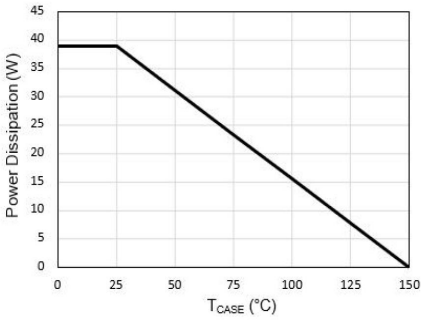


Fig.9 Current De-rating

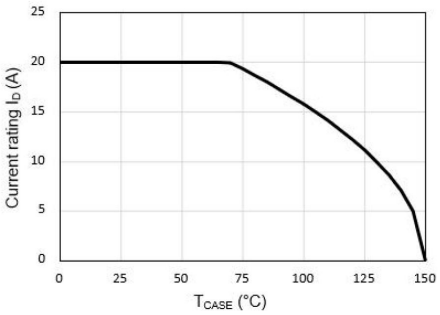
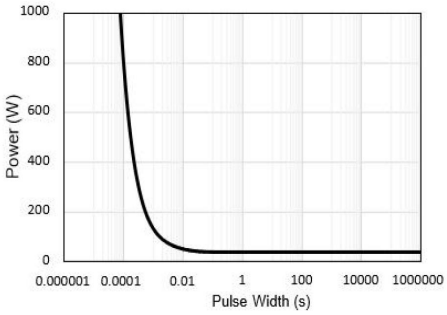


Fig.10 Single Pulse Power Rating Junction-to-case



●P Channel characteristics curve

Fig.11 Maximum Forward Biased Safe Operating Area

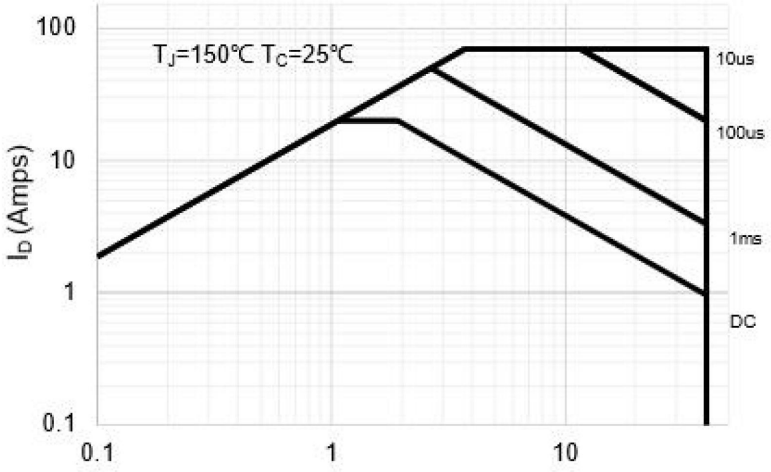
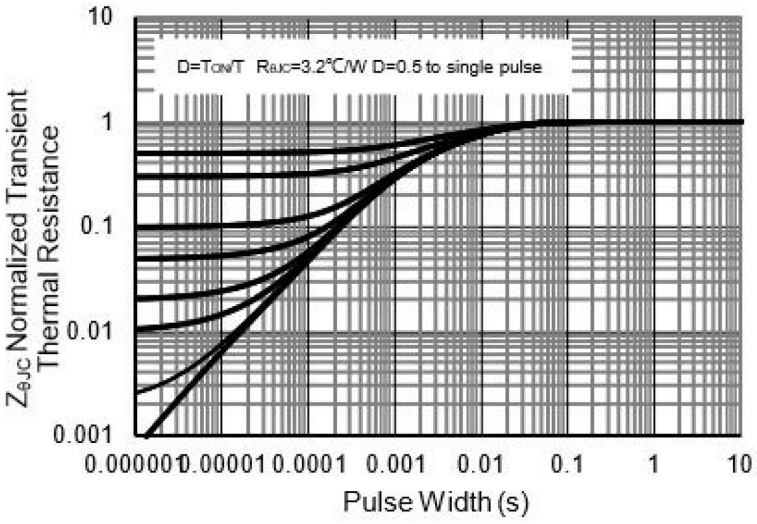
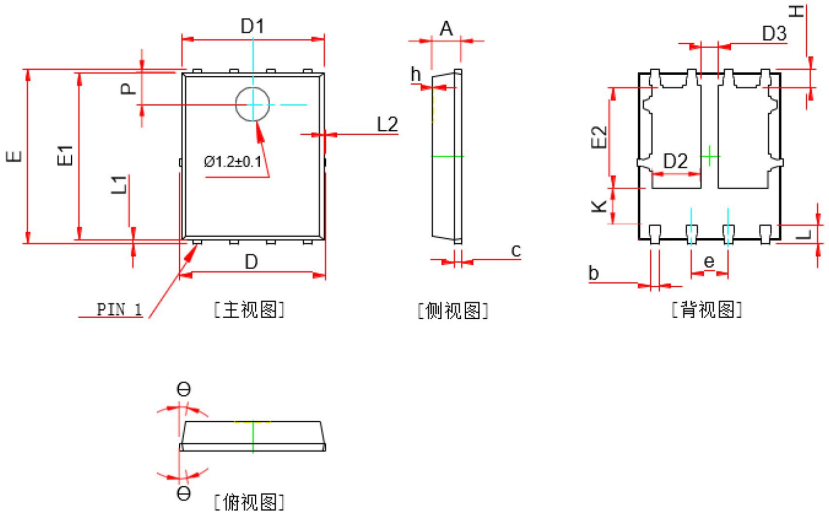


Fig. 12 Normalized Maximum Transient Thermal Impedance



Package Dimensions ： PDFN 5*6 PACKAGE （ N and P-channel ）



COMMON DIMENSIONS

(UNITS OF MEASURE = MILLIMETER)

Symbol	Min.	Nom.	Max.
A	0.900	1.000	1.100
b	0.250	0.300	0.350
c	0.210	0.250	0.340
D	-	-	5.100
D1	4.800	4.900	5.000
D2	1.605	1.705	1.805
D3	0.550	0.600	0.650
e		1.27（BSC）	
E	5.900	6.000	6.100
E1	5.700	5.750	5.800
E2	3.375	3.475	3.575
H	0.550	0.650	0.750
h	-	-	0.050
K	1.200	-	-
L	0.535	0.635	0.735
L1	0.050	0.150	0.250
L2	-	-	0.120
θ	8°	10°	12°
P	1.000	1.100	1.200