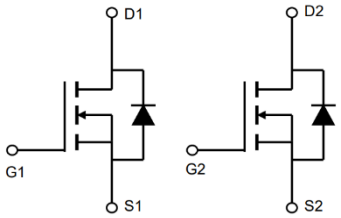
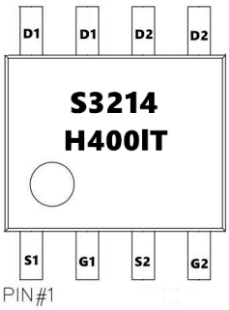
AP10H03S

30V N+N-Channel Enhancement Mode MOSFET

Description

The AP10H03S uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} = 30V I_D =10A

$R_{DS(ON)}$ < 12mΩ @ V_{GS}=10V

Application

Lithium battery protection

Wireless impact

Mobile phone fast charging

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP10H03S	SOP-8	S3214 HT4001T	3000

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	10	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 10V[1]	8.2	A
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	9.5	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	7.6	A
I_{DM}	Pulsed Drain Current[2]	75	A
EAS	Single Pulse Avalanche Energy[3]	24.2	mJ
I_{AS}	Avalanche Current	22	A
P_D@T_C=25°C	Total Power Dissipation[4]	26	W
P_D@T_A=25°C	Total Power Dissipation[4]	1.67	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	75	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	4.8	°C/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	33	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.023	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=8A	---	9	12	mΩ
		V_{GS}=4.5V , I_D=6A	---	14	18	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	1.6	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.08	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=15A	---	24.4	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.8	---	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=4.5V , I_D=12A	---	9.82	---	nC
Q_{gs}	Gate-Source Charge		---	2.24	---	
Q_{gd}	Gate-Drain Charge		---	5.54	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=1.5□ I_D=20A	---	6.4	---	ns
T_r	Rise Time		---	39	---	
$T_{d(off)}$	Turn-Off Delay Time		---	21	---	
T_f	Fall Time		---	4.7	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	896	---	pF
C_{oss}	Output Capacitance		---	126	---	
C_{rss}	Reverse Transfer Capacitance		---	108	---	
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	37	A
I_{SM}	Pulsed Source Current[2,5]		---	---	75	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V

Note :

1、The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=8A
4、The power dissipation is limited by 175℃ junction temperature
5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

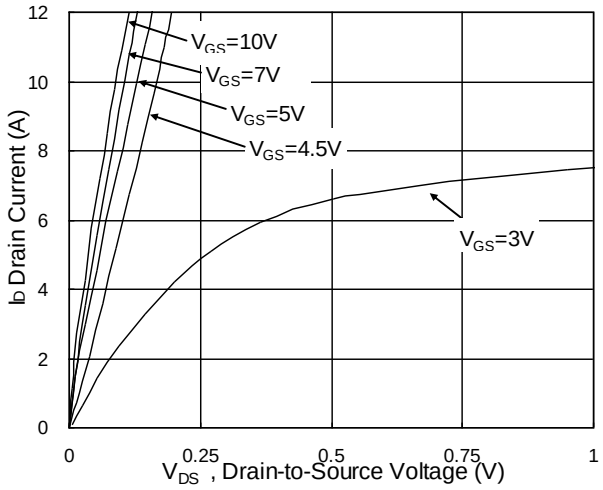


Fig.1 Typical Output Characteristics

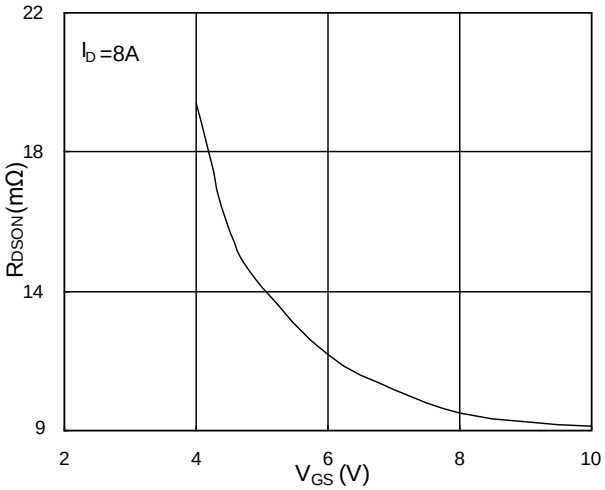


Fig.2 On-Resistance vs. G-S Voltage

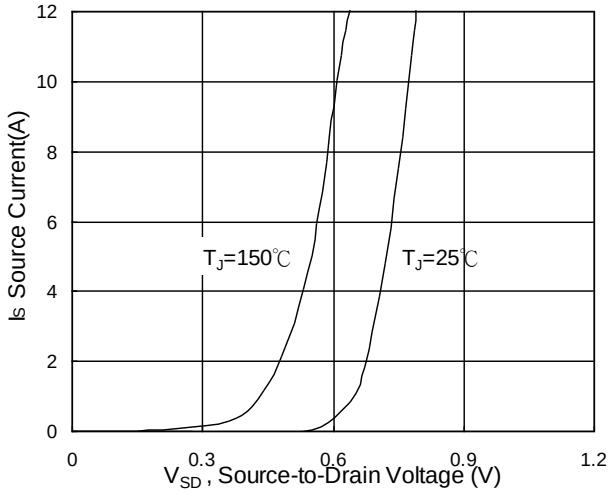


Fig.3 Forward Characteristics of Reverse

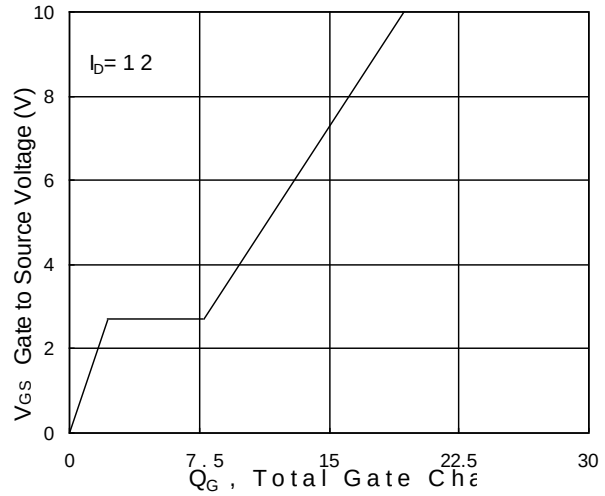


Fig.4 Gate-charge Characteristics

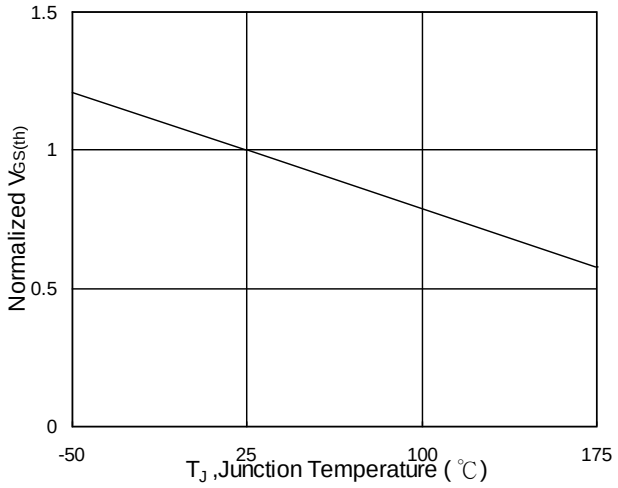


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

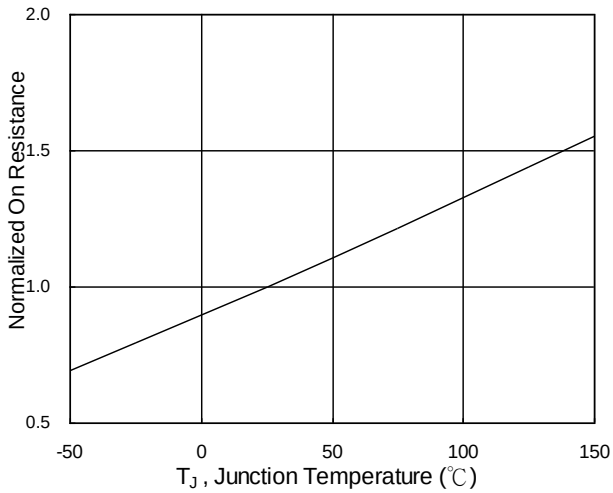


Fig.6 Normalized R_{DSON} vs. T_J

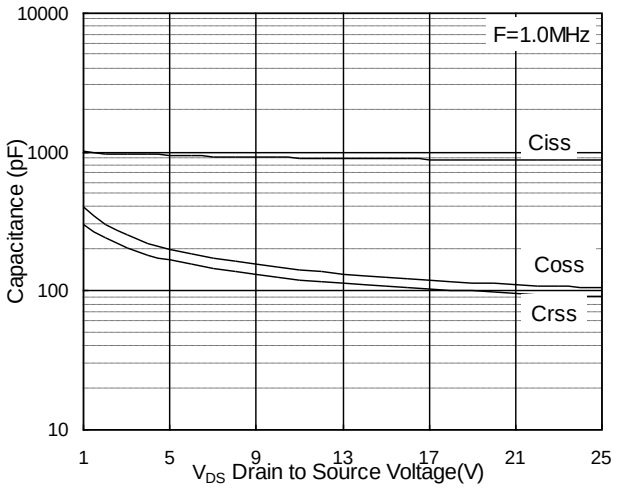


Fig.7 Capacitance

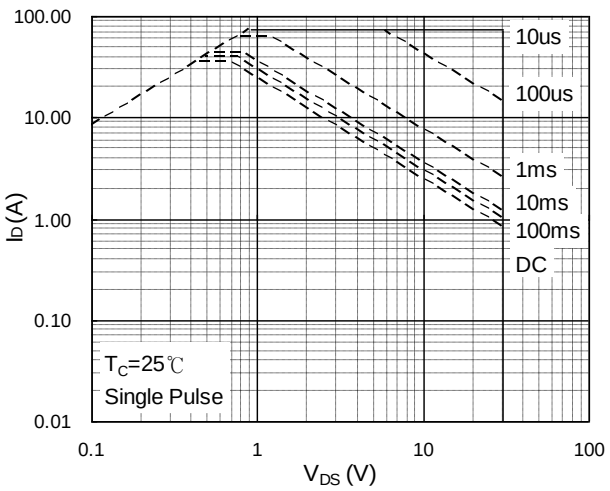


Fig.8 Safe Operating Area

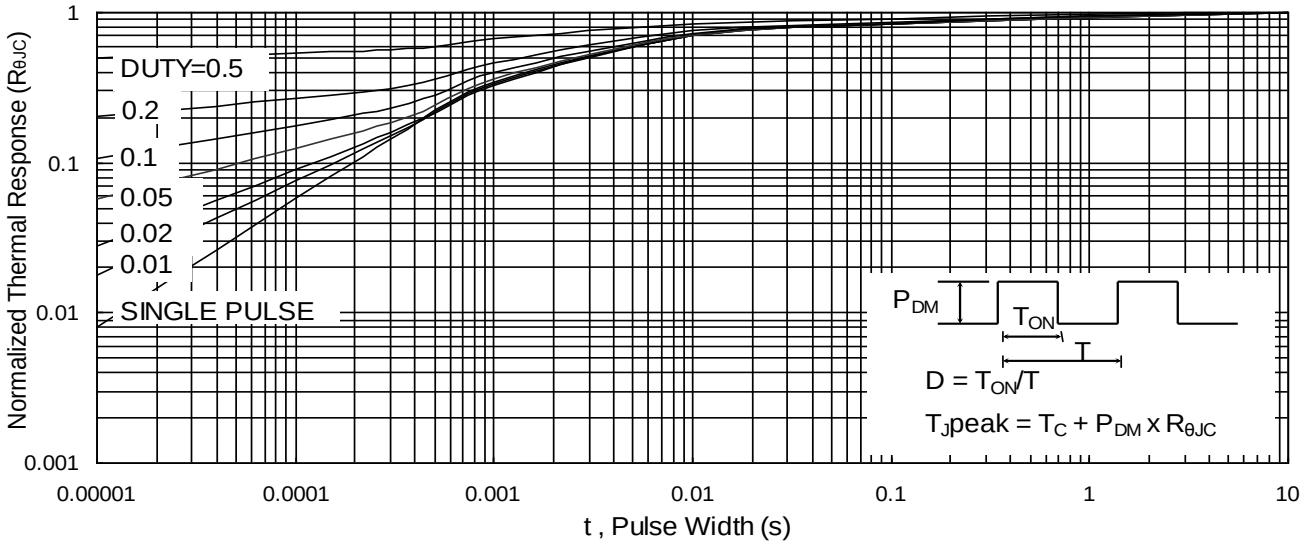


Fig.9 Normalized Maximum Transient Thermal Impedance

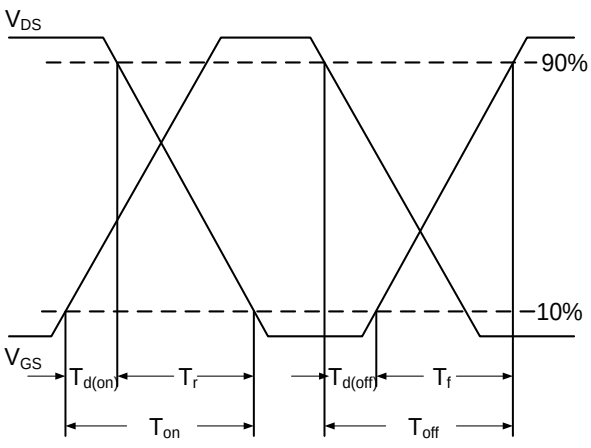


Fig.10 Switching Time Waveform

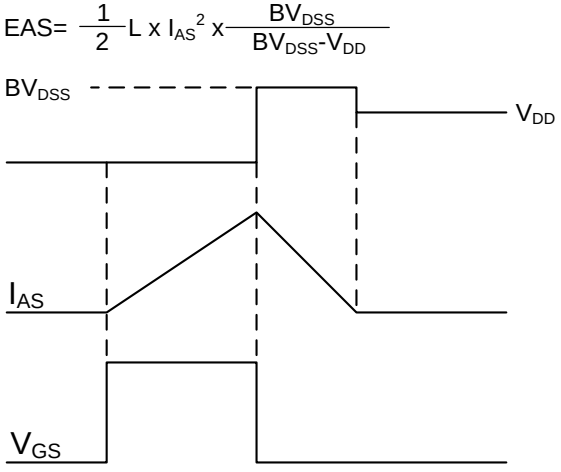
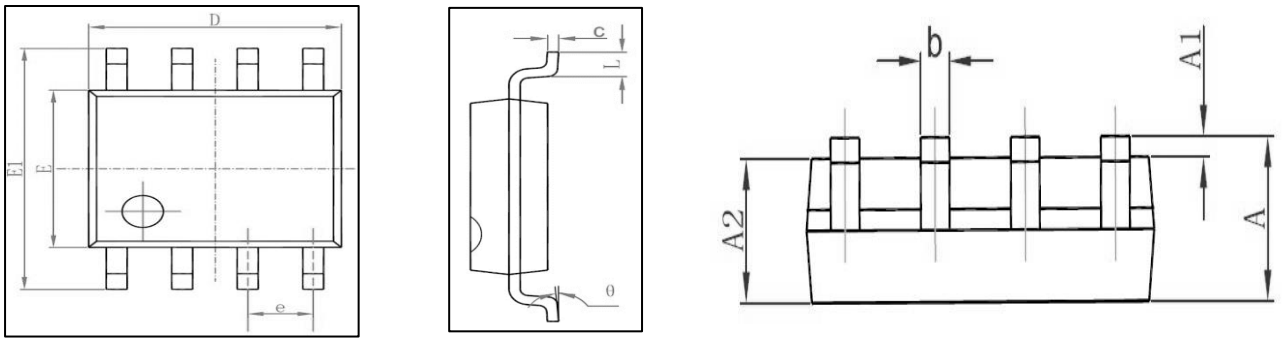
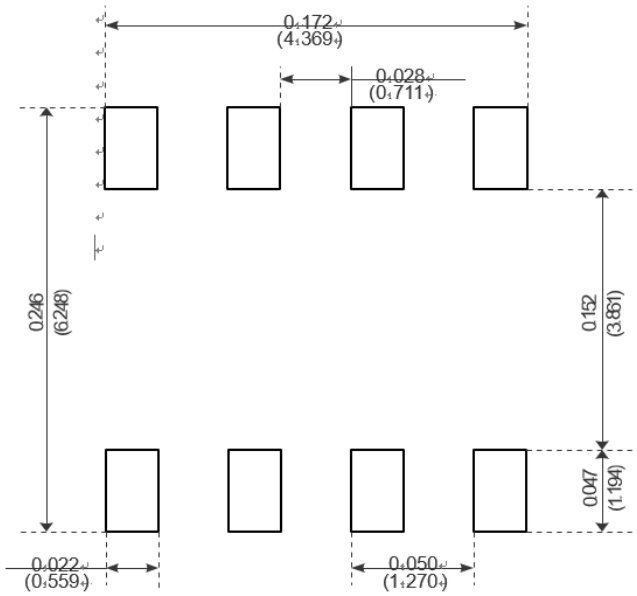


Fig.11 Unclamped Inductive Waveform

Package Mechanical Data-SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Recommended Minimum Pads

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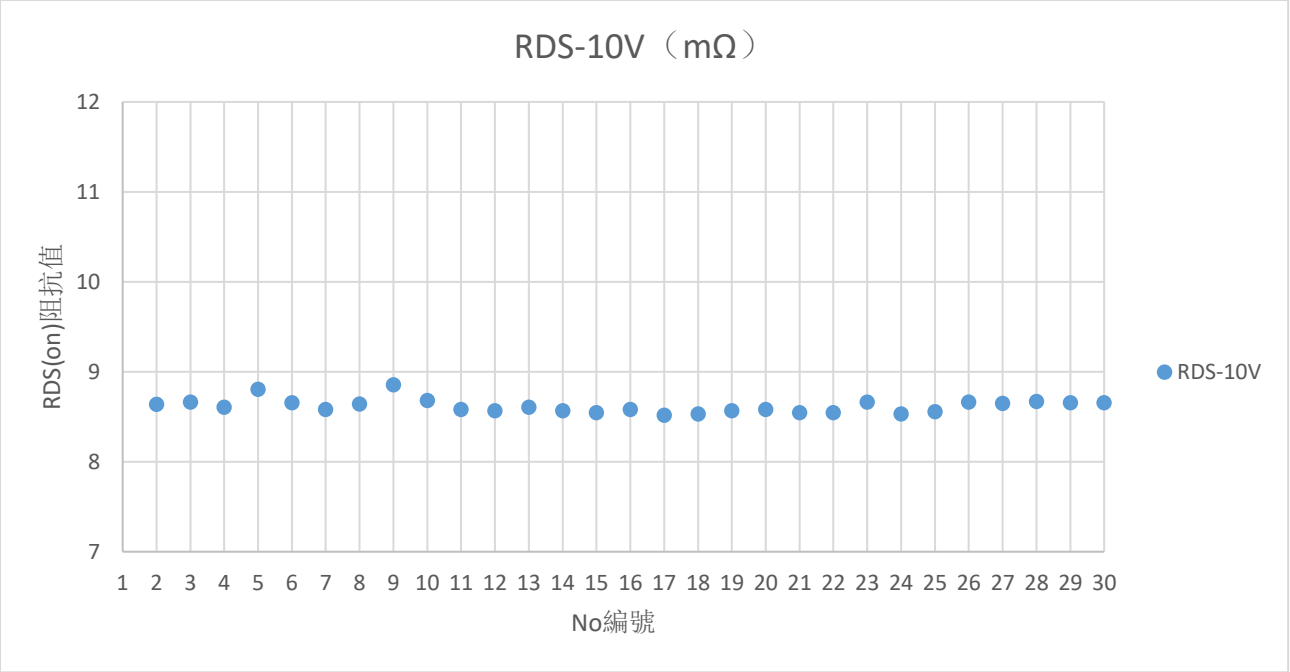
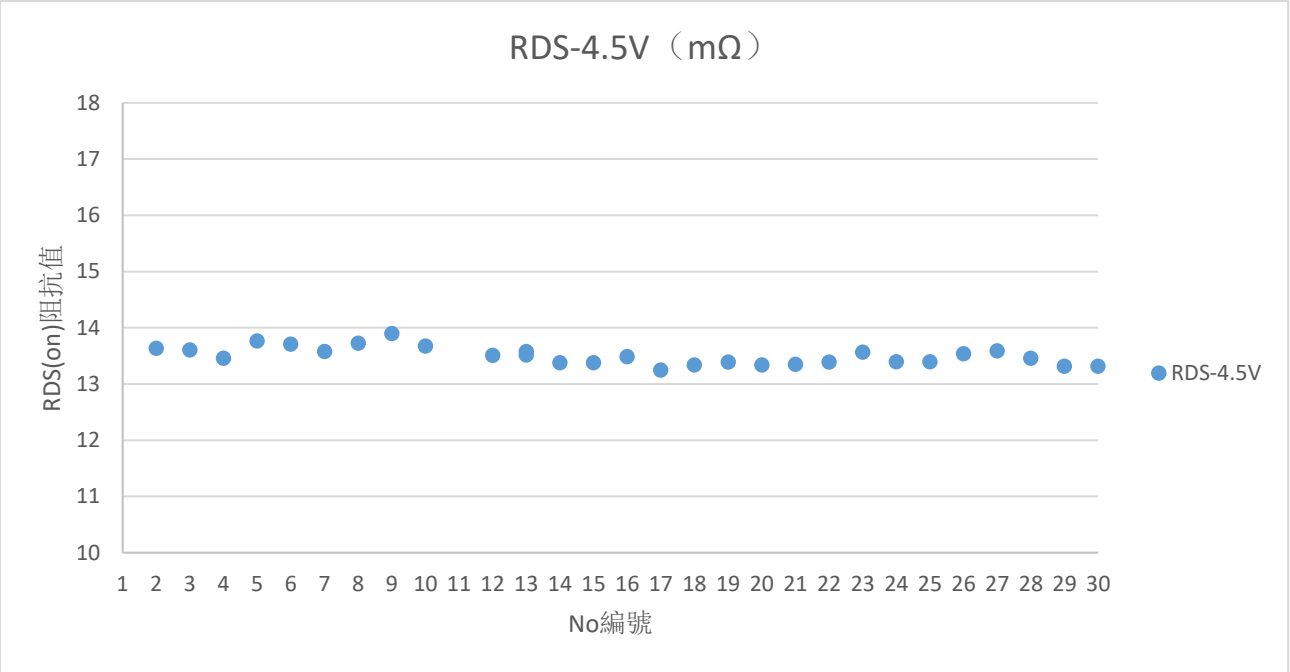
AP10H03S

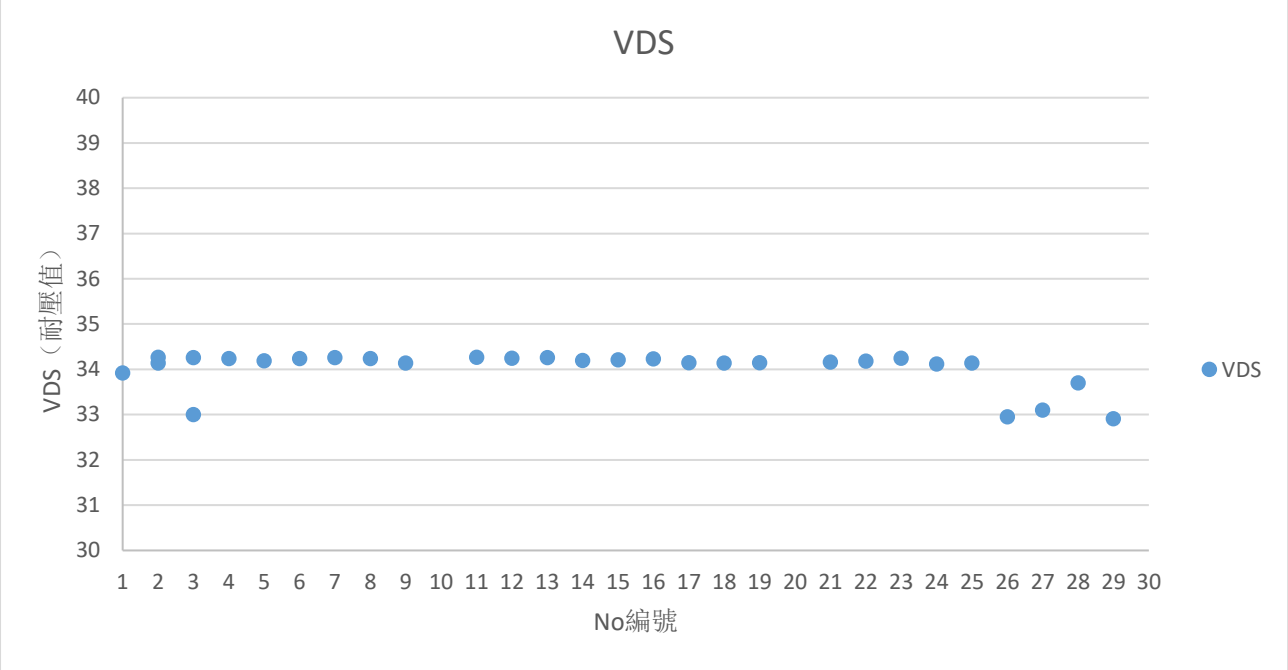
30V N+N-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve3.0	2018/1/31	Initial release
Rve3.1	2020/5/03	Reduce RDS(on) and Change screen printing

Test Report For 30PCS（30pcs 典型測試報告）






VDS
VDS（耐壓值）
40
39
38
37
36
35
34
33
32
31
30
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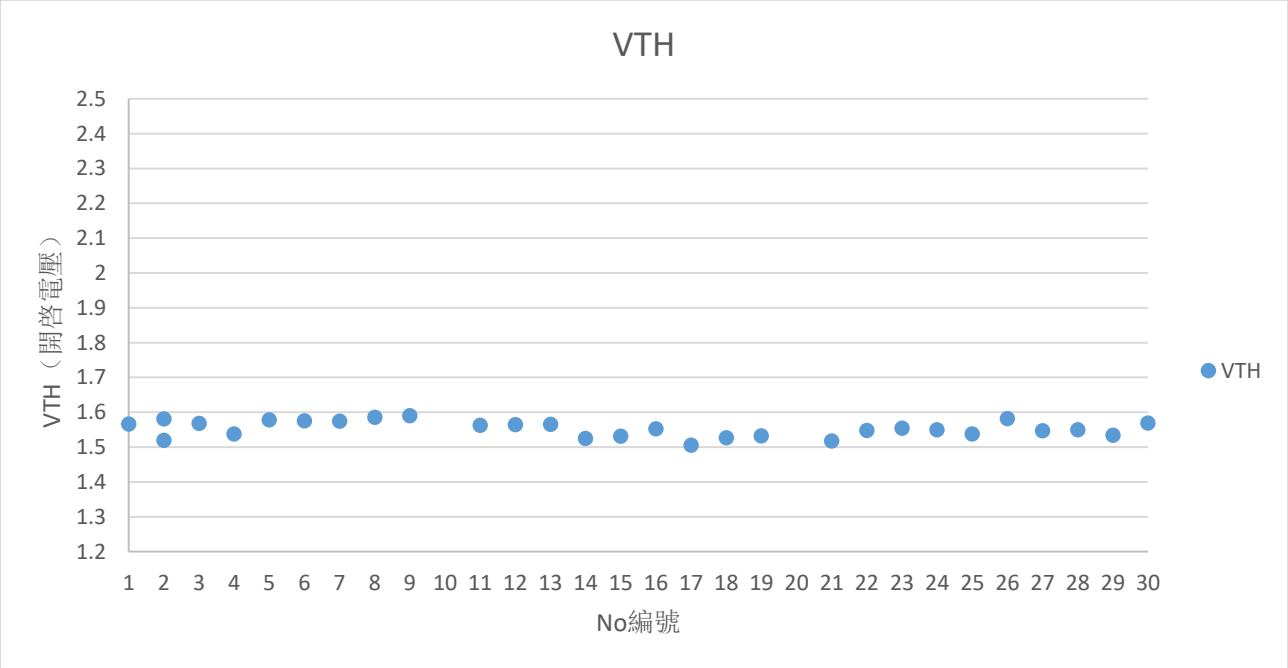
No編號
VDS


VTH
VTH（開啓電壓）
2.5
2.4
2.3
2.2
2.1
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
No編號
VTH