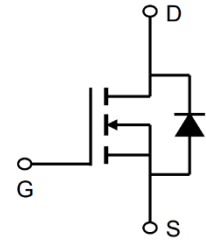


30V N-Channel Enhancement Mode MOSFET

Description

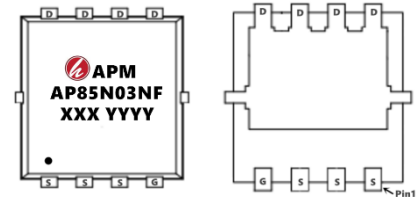
The AP85N03NF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

$V_{DS} = 30V$ $I_D = 85A$

$R_{DS(ON)} < 4m\Omega @ V_{GS}=10V$



Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP85N03NF	PDFN5*6-8L	AP85N03NF XXX YYYY	5000

Absolute Maximum Ratings (TC=25 °C 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 ^{1,6}	85	A
I _D @T _C =100 °C	Continuous Drain Current, V _{GS} @ 10V ^{1,6}	68	A
IDM	Pulsed Drain Current ²	216	A
EAS	Single Pulse Avalanche Energy ³	650	mJ
IAS	Avalanche Current	53.8	A
P _D @T _C =25 °C	Total Power Dissipation ⁴	45	W
P _D @T _A =25 °C	Total Power Dissipation ⁴	5	W
TSTG	Storage Temperature Range	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	°C
R _{θJA}	Thermal Resistance Junction-Ambient ¹	62	°C/W
R _{θJA}	Thermal Resistance Junction-Ambient ¹ (t ≤ 10s)	25	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	2.8	°C/W

30V N-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	33	---	V
ΔBVDSS/ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.0213	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =30A	---	2.3	4	mΩ
		V _{GS} =4.5V, I _D =15A	---	4.3	6	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.6	2.5	V
ΔVGS(th)	V _{GS(th)} Temperature Coefficient		---	-5.73	---	mV/°C
IDSS	Drain-Source Leakage Current	V _{DS} =24V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =55°C	---	---	5	
IGSS	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =5V, I _D =30A	20.08	26.5	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.4	---	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V, V _{GS} =4.5V, I _D =15A	---	70	---	nC
Q _{gs}	Gate-Source Charge		---	12	---	
Q _{gd}	Gate-Drain Charge		---	17	---	
Td(on)	Turn-On Delay Time	V _{DD} =15V, V _{GS} =10V, R _G =3.3Ω, I _D =15A	---	11	---	ns
T _r	Rise Time		---	120	---	
Td(off)	Turn-Off Delay Time		---	25	---	
T _f	Fall Time		---	60	---	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	3500	---	pF
C _{oss}	Output Capacitance		---	386	---	
Cr _{ss}	Reverse Transfer Capacitance		---	358	---	
I _s	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	---	---	90	A
ISM	Pulsed Source Current ^{2,5}		---	---	360	A
VSD	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.2	V

Note :

- The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- The data tested by pulsed, pulse width ≅ 300us, duty cycle ≅ 2%
- The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=53.8A
- The power dissipation is limited by 175°C junction temperature
- The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.
- Package limitation current is 85A.

Typical Characteristics

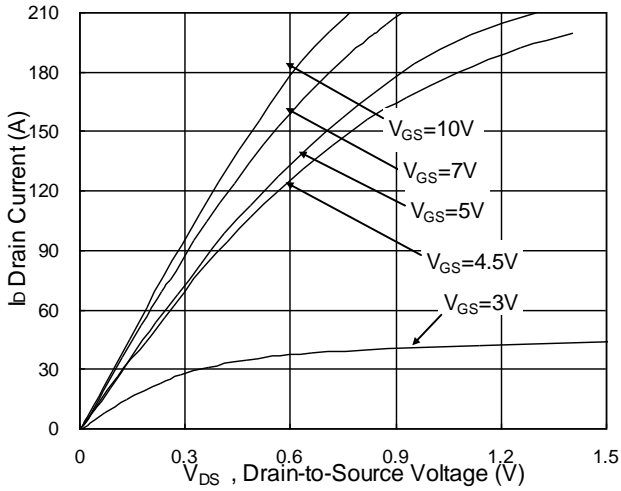


Fig.1 Typical Output Characteristics

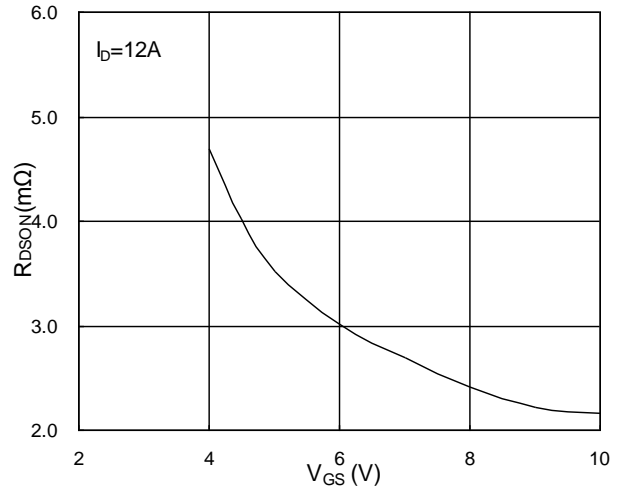


Fig.2 On-Resistance vs. G-S Voltage

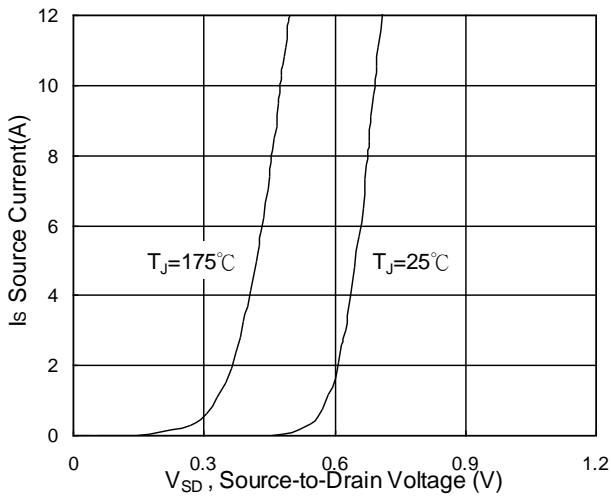


Fig.3 Forward Characteristics of Reverse

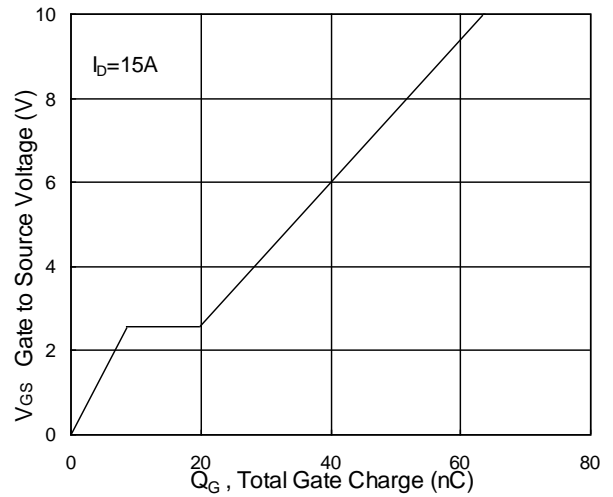


Fig.4 Gate-Charge Characteristics

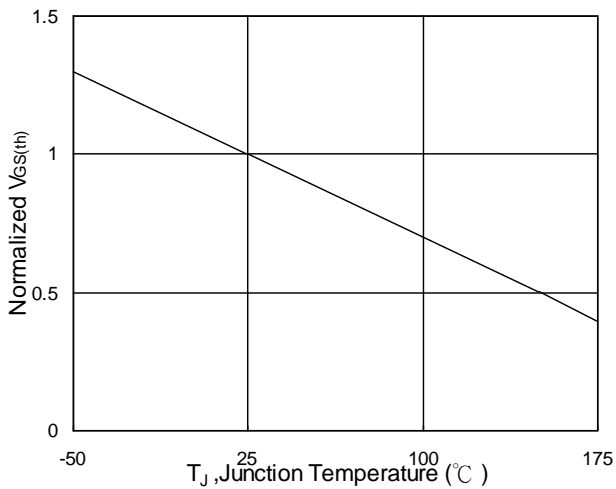


Fig.5 Normalized V_{GS(th)} vs. T_J

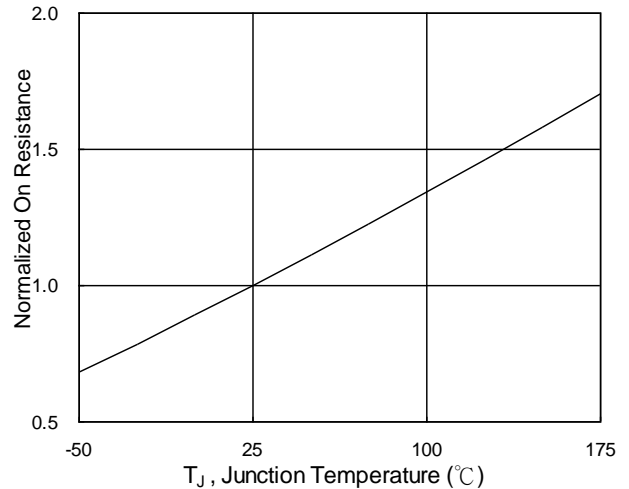


Fig.6 Normalized R_{DSON} vs. T_J



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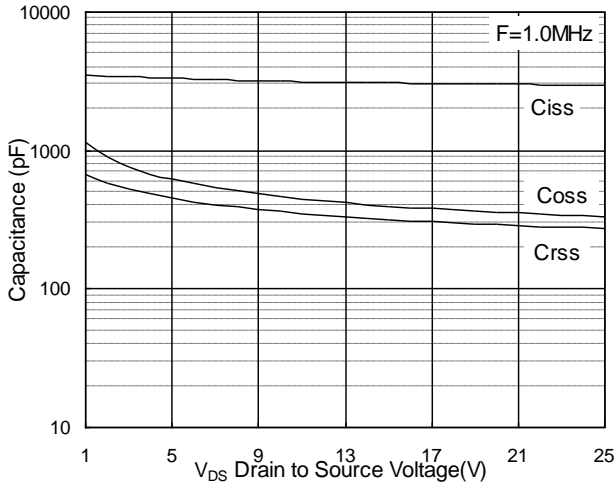


Fig.7 Capacitance

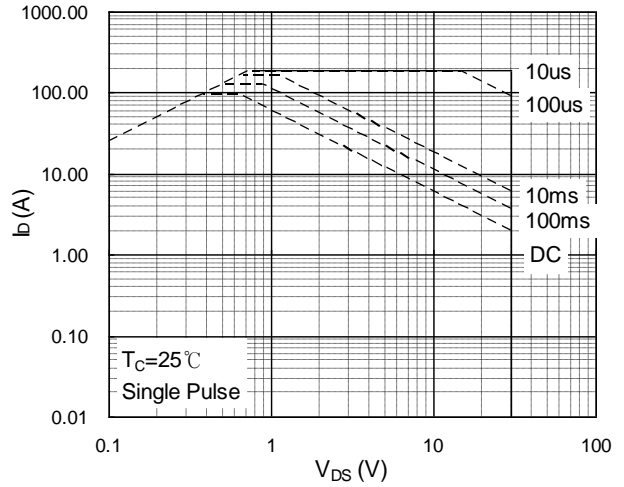


Fig.8 Safe Operating Area

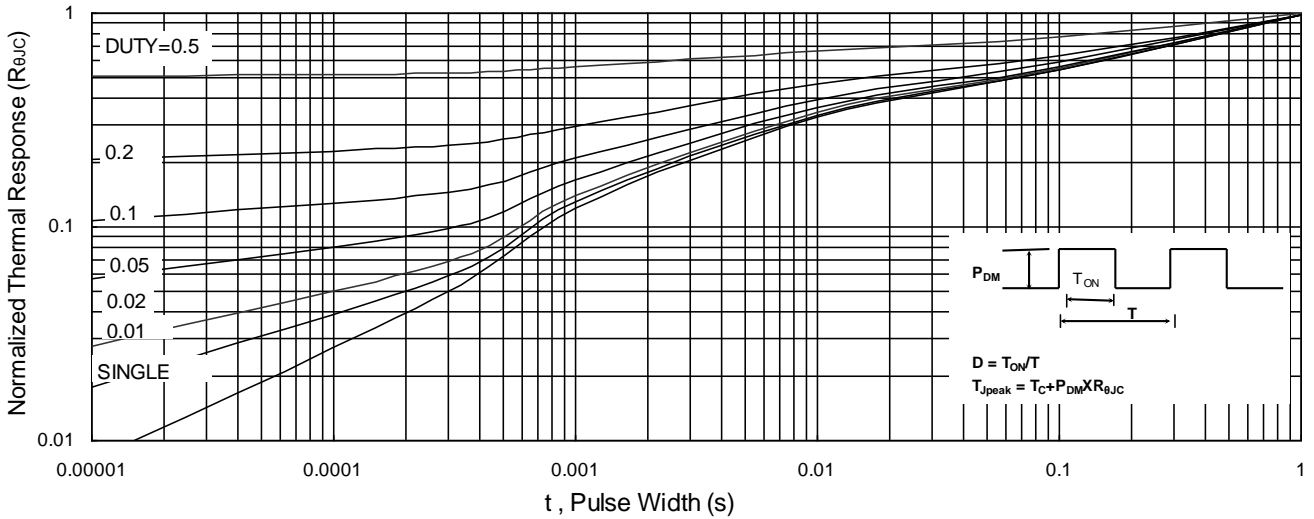


Fig.9 Normalized Maximum Transient Thermal Impedance

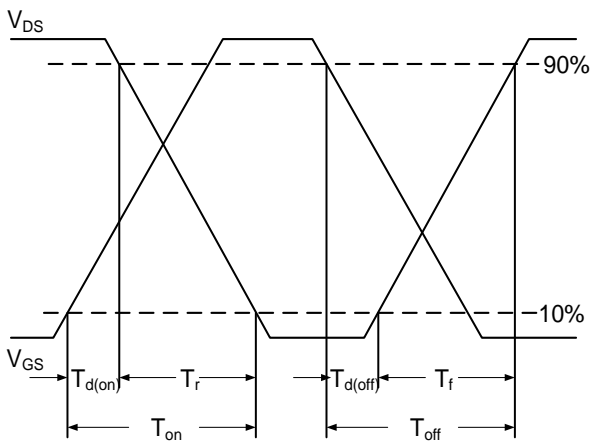


Fig.10 Switching Time Waveform

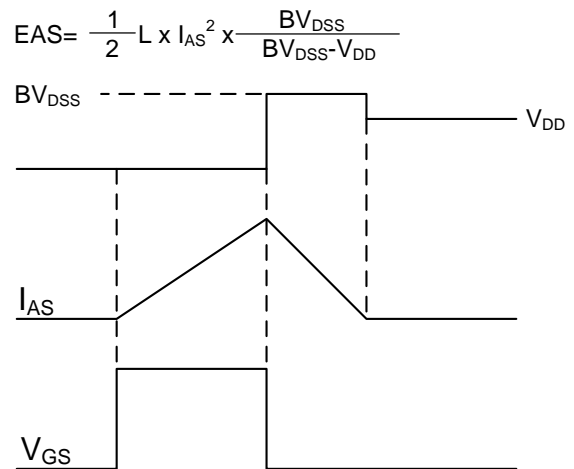
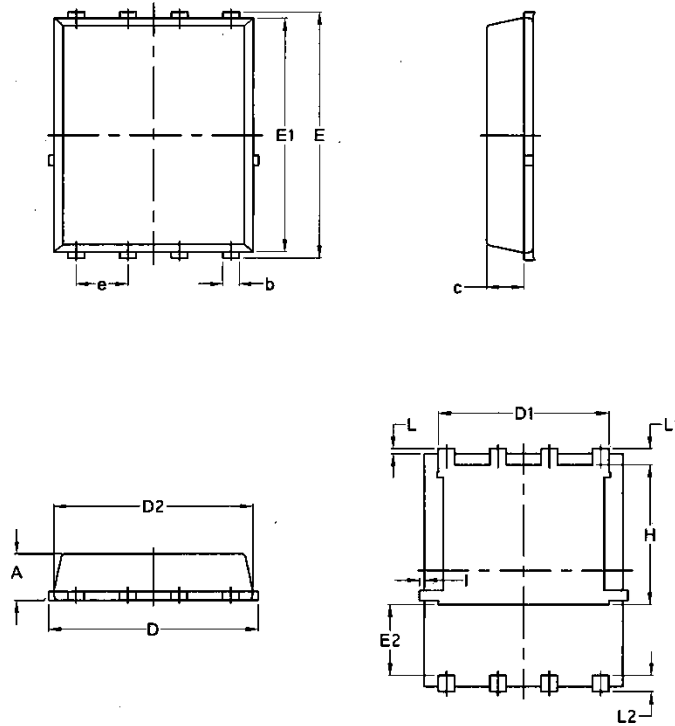


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-DFN5*6-8L-JQ Single



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

30V N-Channel Enhancement Mode MOSFET**Attention**

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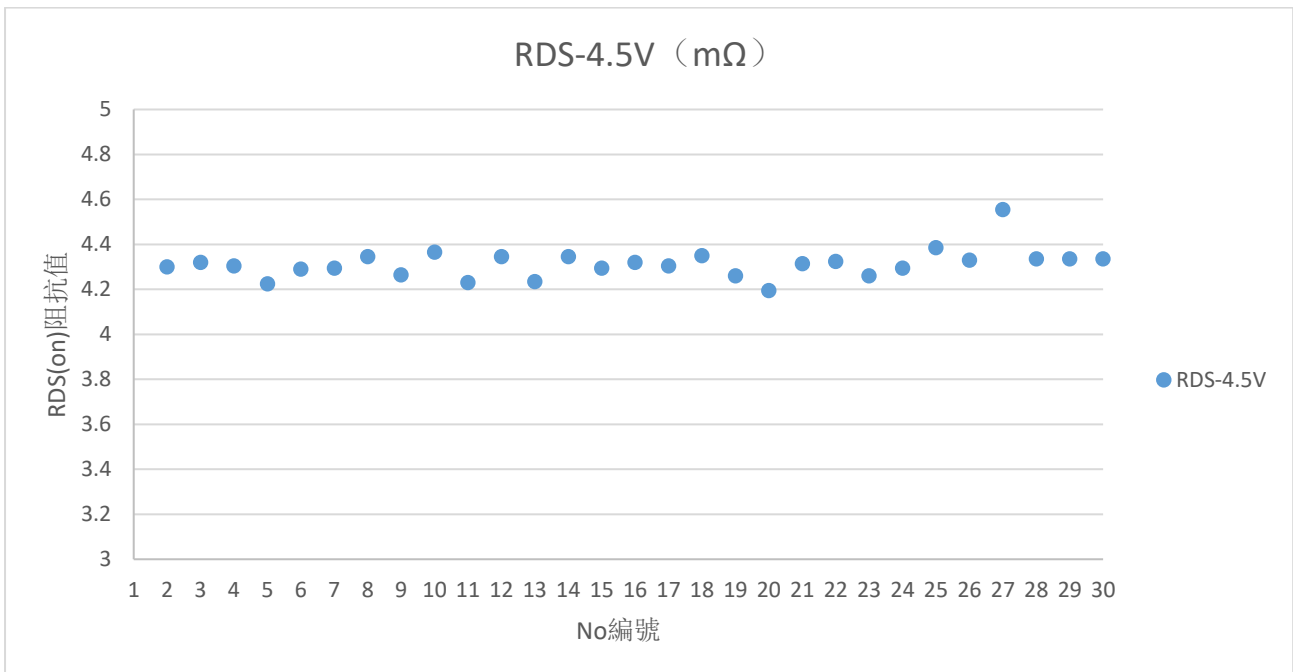
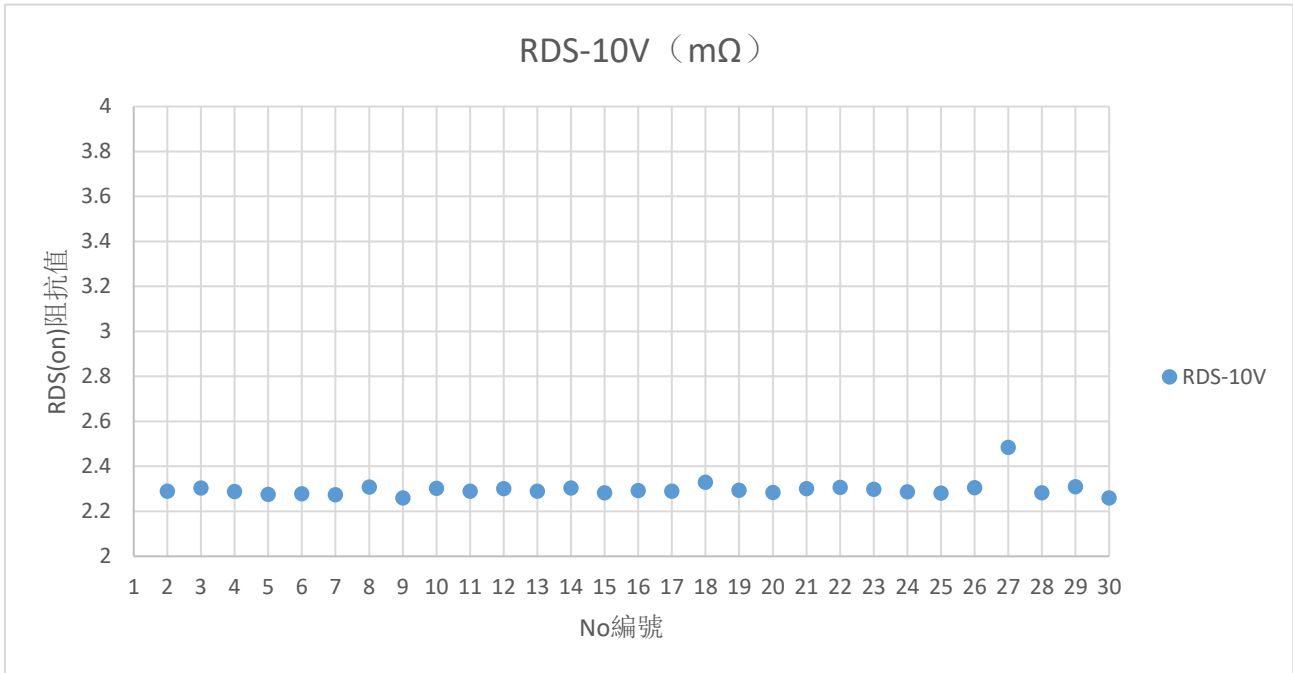
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Edition	Date	Change
Rve1.0	2019/8/1	Initial release

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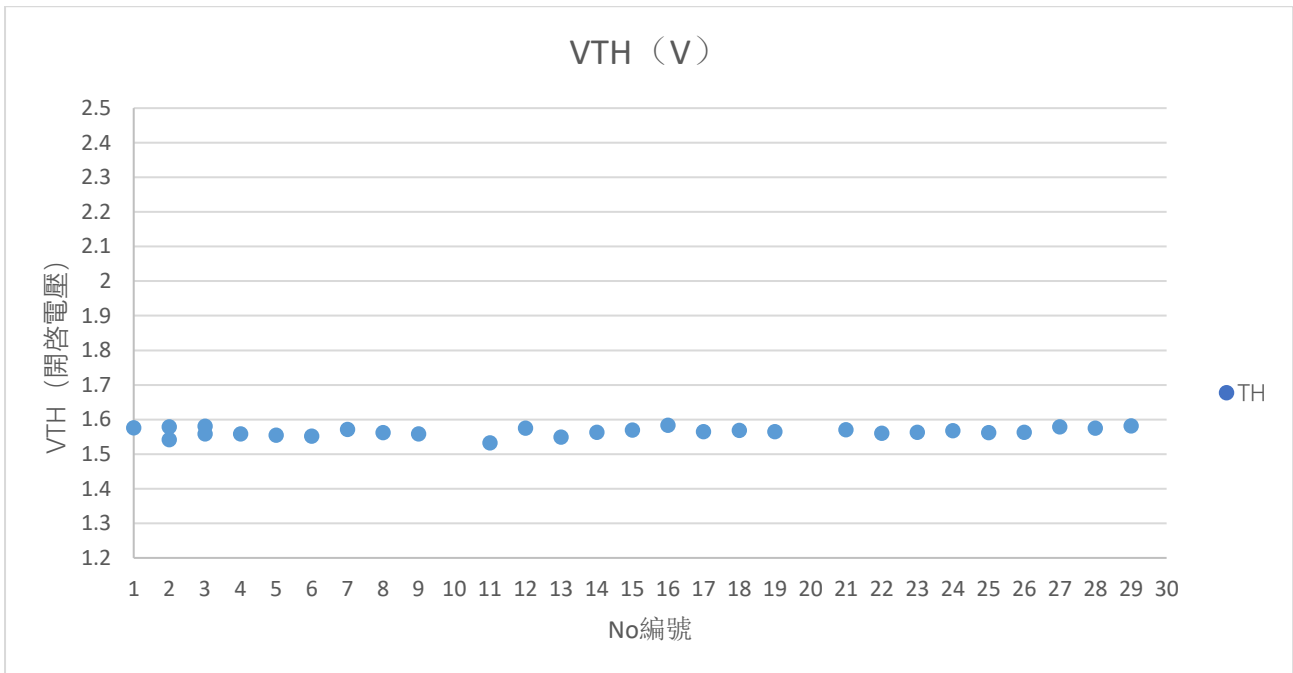
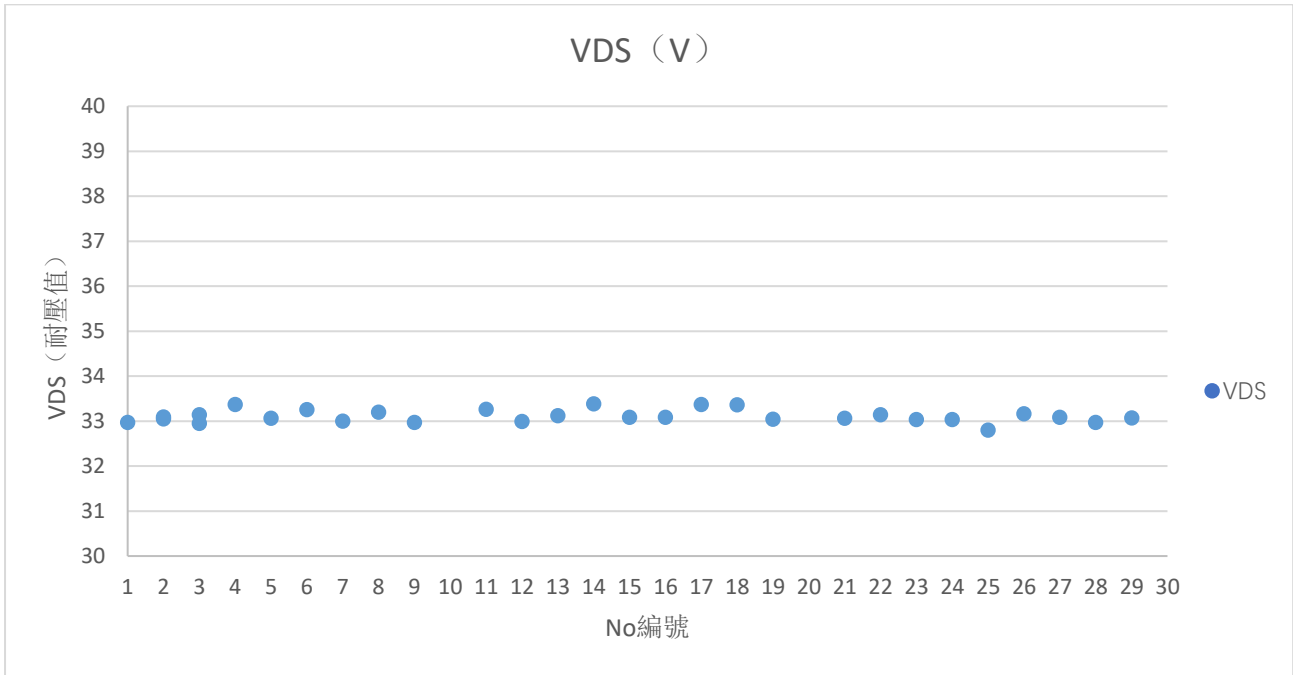


Test Report For 30PCS (30pcs 典型測試報告)





30V N-Channel Enhancement Mode MOSFET



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