

30V N-Channel Enhancement Mode MOSFET

Description

The AP65N03NF 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

$V_{DS}=30V$ $I_D=65A$

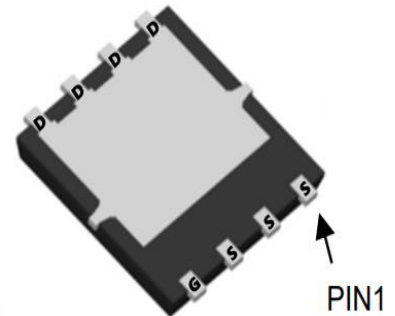
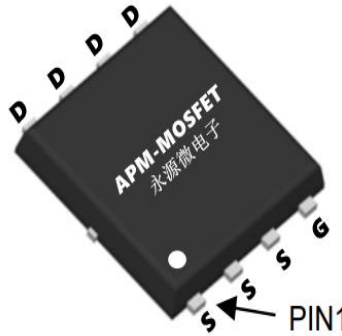
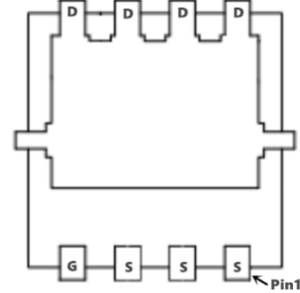
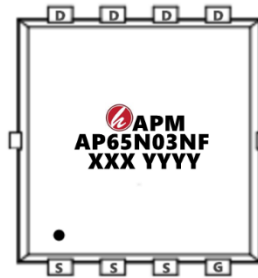
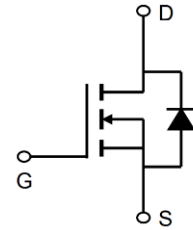
$R_{DS(ON)} < 5.5m\Omega$ @ $V_{GS}=10V$ (Type: 4.0m Ω)

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP65N03NF	PDFN5*6-8L	AP65N03NF XXXX YYYY	5000

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^1$	65	A
$I_D@T_C=75^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^1$	48	A
I_{DM}	Pulsed Drain Current ²	240	A
EAS	Single Pulse Avalanche Energy ³	56	mJ
I_{AS}	Avalanche Current	15	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ⁴	46	W
$P_D@T_A=25^{\circ}C$	Total Power Dissipation ⁴	2.72	W
T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 175	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	25	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	2.72	$^{\circ}C/W$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	32	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.6	2.5	V
RDS(on)	Static Drain-Source on-Resistance	V _{GS} =10V, I _D =30A	-	4.0	5.5	mΩ
		V _{GS} =4.5V, I _D =20A	-	6.1	8.5	
Ciss	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1.0MHz	-	1614	-	pF
Coss	Output Capacitance		-	245	-	pF
Crss	Reverse Transfer Capacitance		-	215	-	pF
Qg	Total Gate Charge	V _{DS} =15V, I _D =30A, V _{GS} =10V	-	33.7	-	nC
Qgs	Gate-Source Charge		-	8.5	-	nC
Qgd	Gate-Drain("Miller") Charge		-	7.5	-	nC
td(on)	Turn-on Delay Time	V _{DS} =15V, I _D =30A, R _{GEN} =3Ω, V _{GS} =10V	-	7.5	-	ns
t _r	Turn-on Rise Time		-	14.5	-	ns
td(off)	Turn-off Delay Time		-	35.2	-	ns
t _f	Turn-off Fall Time		-	9.6	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	70	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	280	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V

Note :

- 1、The data tested by surface mounted on a 1 inch² 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 VDD=24V,VGS=10V,L=0.5mH,IAS=18A
- 4、The power dissipation is limited by 175°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

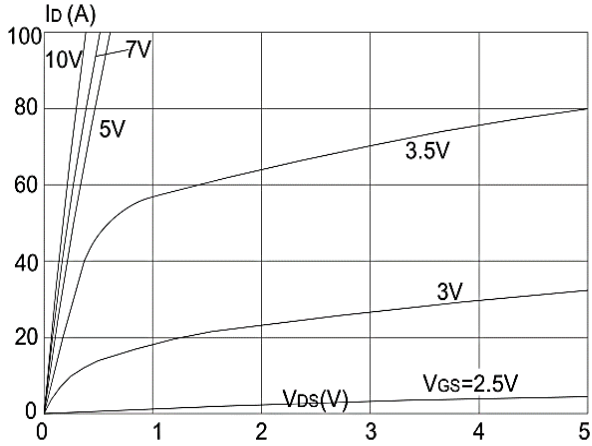


Figure1: Output Characteristics

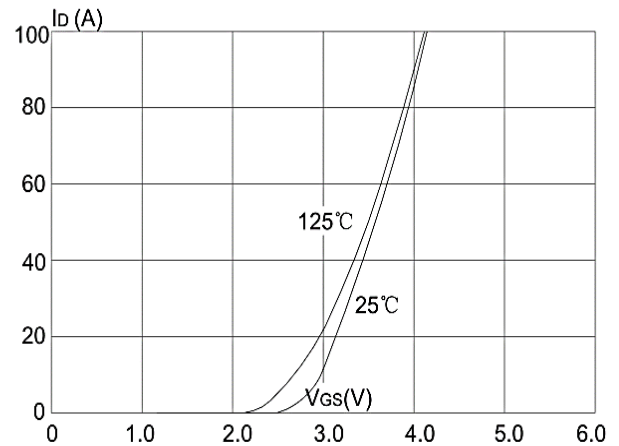


Figure 2: Typical Transfer Characteristics

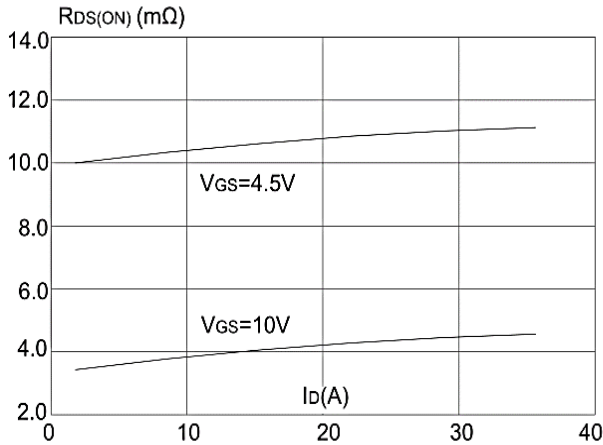


Figure 3: On-resistance vs. Drain Current

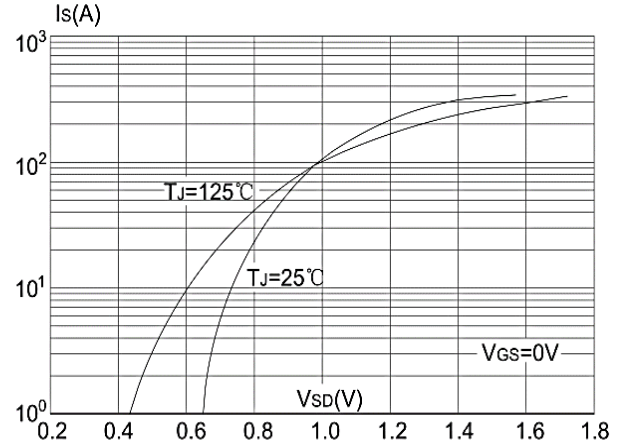


Figure 4: Body Diode Characteristics

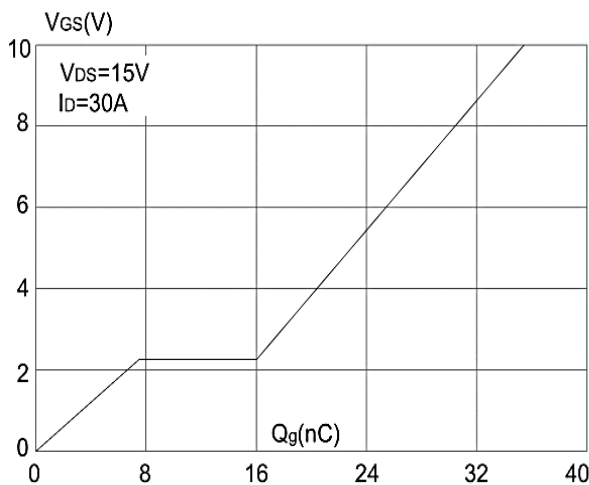


Figure 5: Gate Charge Characteristics

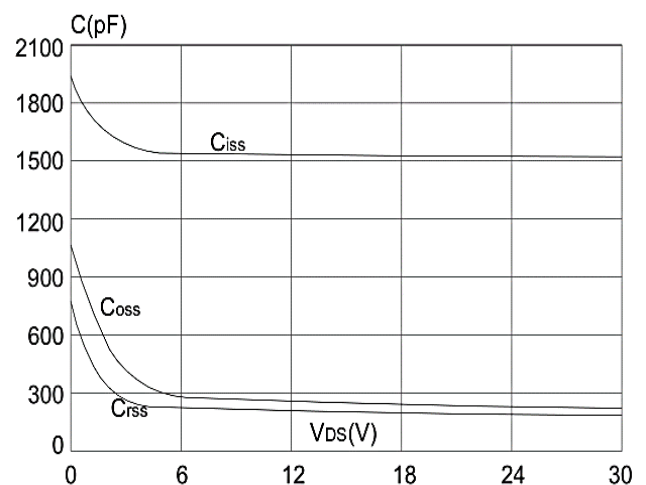


Figure 6: Capacitance Characteristics

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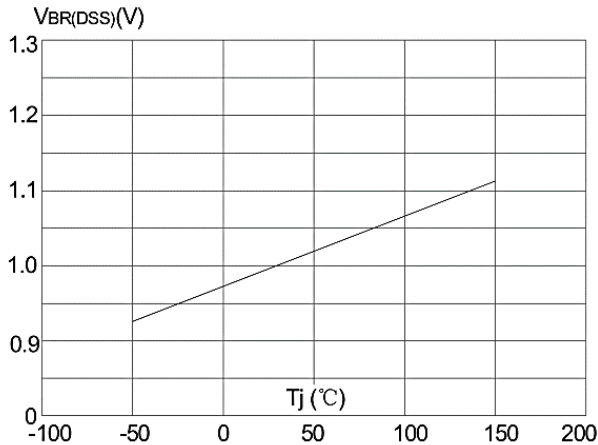


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

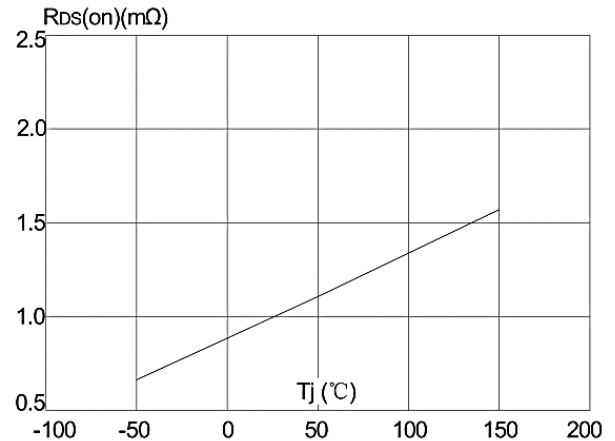


Figure 8: Normalized on Resistance vs. Junction Temperature

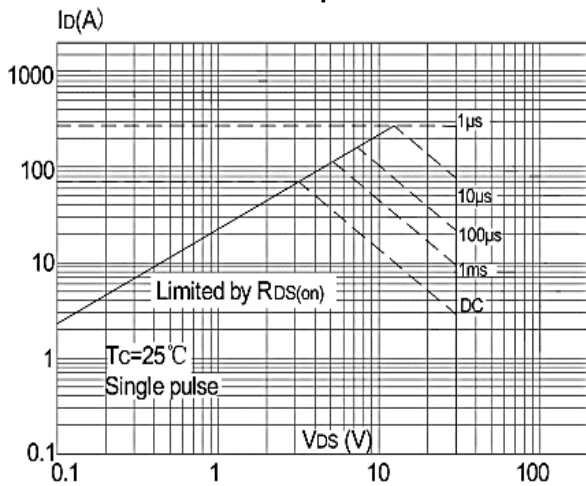


Figure 9: Maximum Safe Operating Area vs. Case Temperature

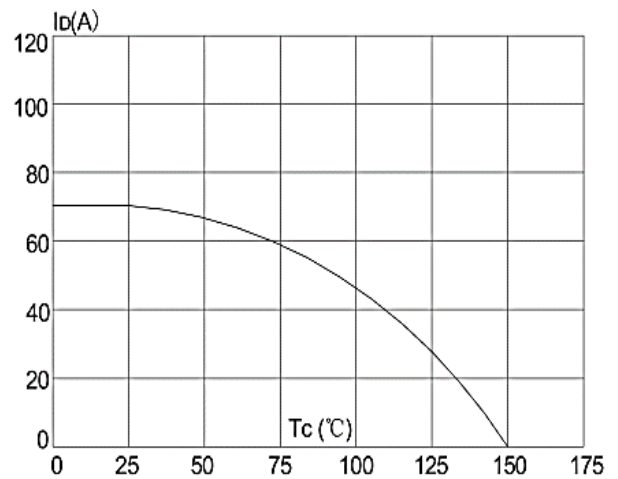


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

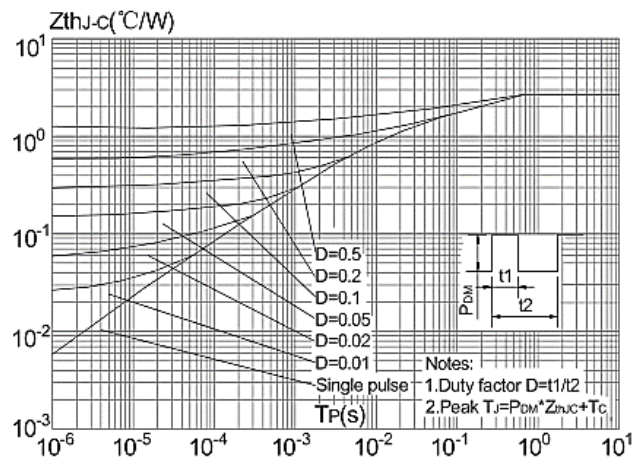
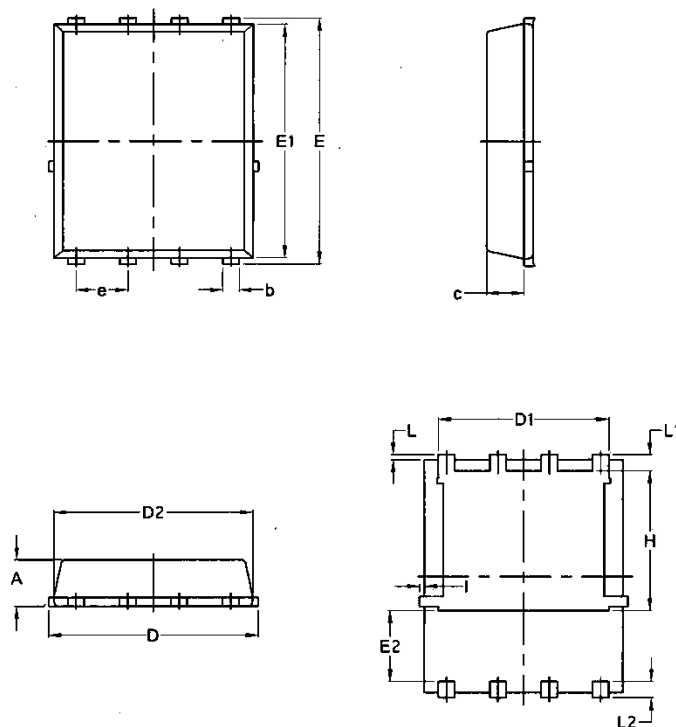


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ca

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



Symbol	Common			
	mm		Inch	
	Mim	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

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Edition	Date	Change
Rve1.0	2021/5/1	Initial release

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