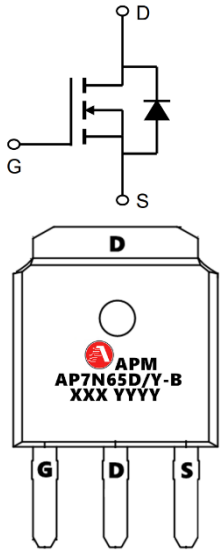
AP7N65D/Y-B

650V N-Channel Enhancement Mode MOSFET

Description

The AP7N65D/Y is silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.



General Features

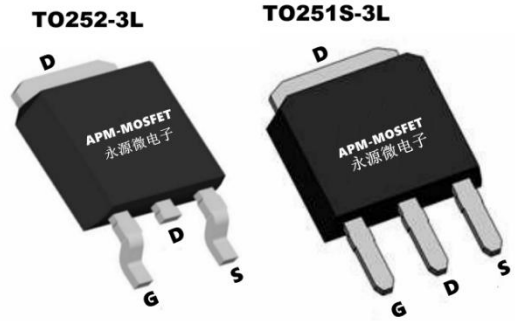
V_{DS} = 650V I_D =7A

$R_{DS(ON)}$ < 1.35Ω @ V_{GS}=10V （**Type：1.15Ω**）

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP7N65D-B	TO252-3L	AP7N65D-B XXX YYYY	2500
AP7N65Y-B	TO251S-3L	AP7N65Y-B XXX YYYY	4000

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

Symbol	Parameter	Value	Unit
VDSS	Drain-Source Voltage (V_{GS} = 0V)	650	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	7.0	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	5.2	A
IDM	Pulsed Drain Current (note1)	28	A
VGS	Gate-Source Voltage	±30	V
EAS	Single Pulse Avalanche Energy	735	mJ
IAS	Avalanche Current	24	A
P_D	Power Dissipation (T_C = 25ºC)	32.9	W
TJ, Tstg	Operating Junction and Storage Temperature Range	-55~+150	ºC
RthJC	Thermal Resistance, Junction-to-Case	1.98	ºC/W
RthJA	Thermal Resistance, Junction-to-Ambient	62.5	ºC/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	650	700	--	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}= 650V, V_{GS}= 0V, T_J=25ºC	--	--	1	μA
IGSS	Gate-Source Leakage	V_{GS} = ±30V	--	--	±100	nA
VGS(th)	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.0	4.0	V
RDS(on)	Drain-Source On-Resistance (Note3)	V_{GS} = 10V, I_D = 3.5A	--	1.15	1.35	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, f=1.0MHz	--	1091	--	pF
C_{oss}	Output Capacitance		--	86	--	
C_{rss}	Reverse Transfer Capacitance		--	5	--	
Q_g	Total Gate Charge	V_{DD}=420V, I_D=7A, V_{GS}=10V	--	20	--	nC
Q_{gs}	Gate-Source Charge		--	17	--	
Q_{gd}	Gate-Drain Charge		--	60	--	
td(on)	Turn-on Delay Time	V_{DD}=325V, I_D = 7A, R_G = 25Ω	--	19	--	ns
t_r	Turn-on Rise Time		--	17	--	
td(off)	Turn-off Delay Time		--	59	--	
t_f	Turn-off Fall Time		--	22	--	
IS	Continuous Body Diode Current	T_C = 25 ºC	--	--	7.0	A
ISM	Pulsed Diode Forward Current		--	--	28	A
V_{SD}	Body Diode Voltage	T_J = 25ºC, I_{SD} = 7A, V_{GS} = 0V	--	--	1.4	V
trr	Reverse Recovery Time	V_{GS} = 0V,I_S = 7A, di_F/dt =100A /μs，VDS=320V	--	400	--	ns
Q_{rr}	Reverse Recovery Charge		--	3	--	μC

Note :

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2、The EAS data shows Max. rating . IAS=4.5A, VDD= 50V, RG=25Ω, Starting TJ=25 ºC

3、The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

4、The power dissipation is limited by 150℃ 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

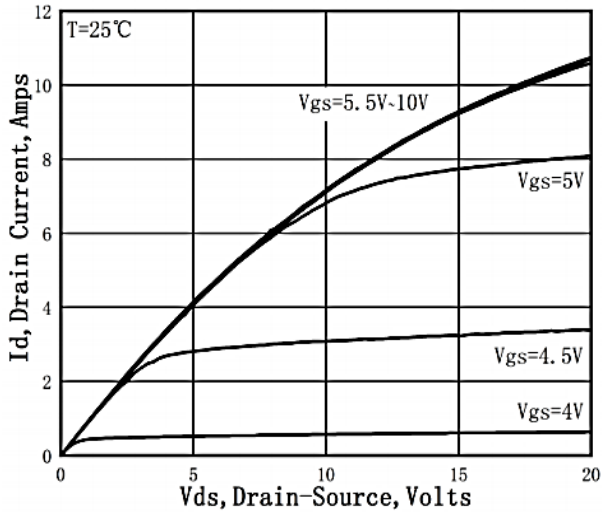


Figure 1.On-Region Characteristics

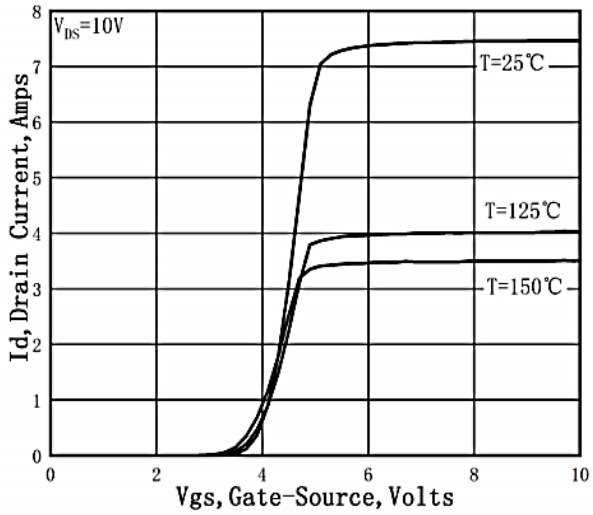


Figure 2. Transfer Characteristics

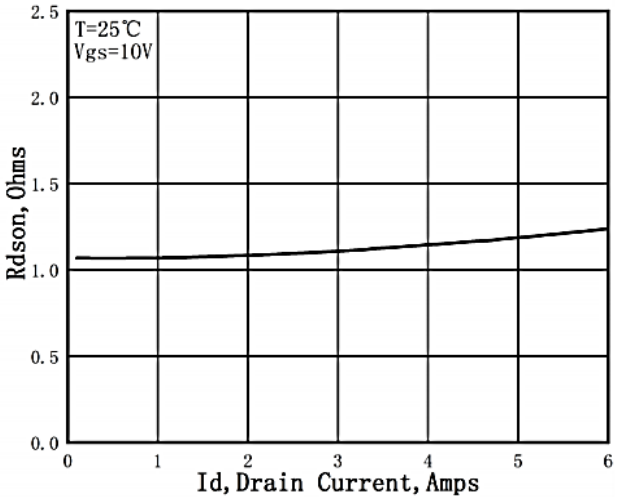


Figure 3.Static Drain-Source On Resistance

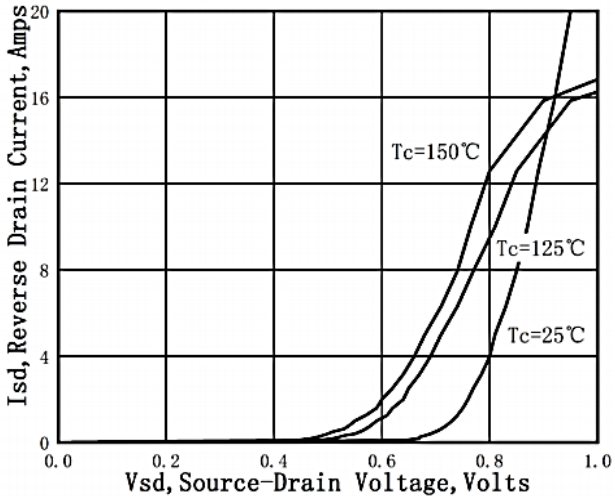


Figure 4. Typical Body Diode Transfer Characteristics

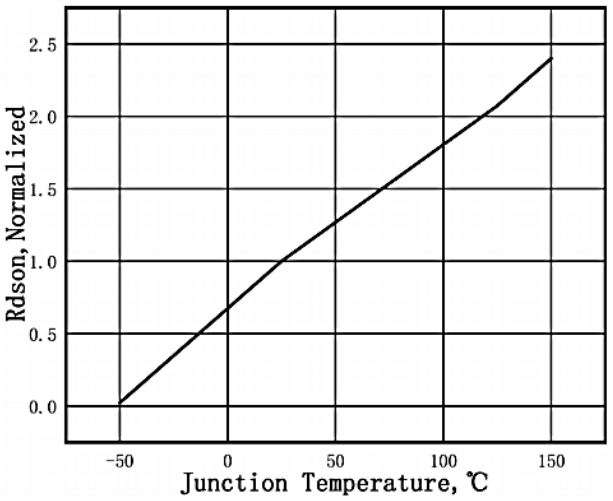


Figure 5. Normalized $R_{DS(on)}$ vs.Temperature

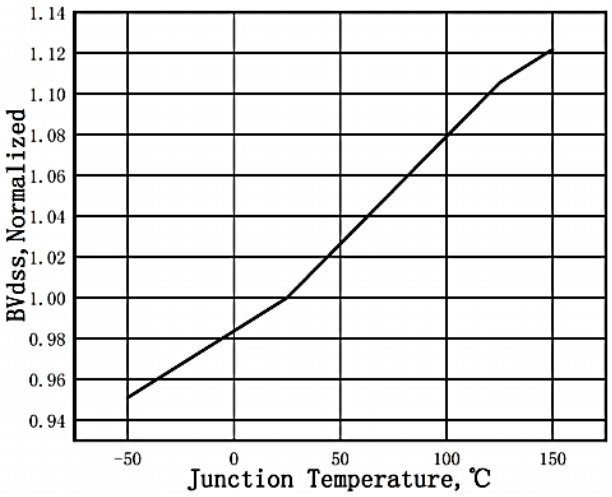


Figure 6. Normalized BV_{DSS} vs.Temperature

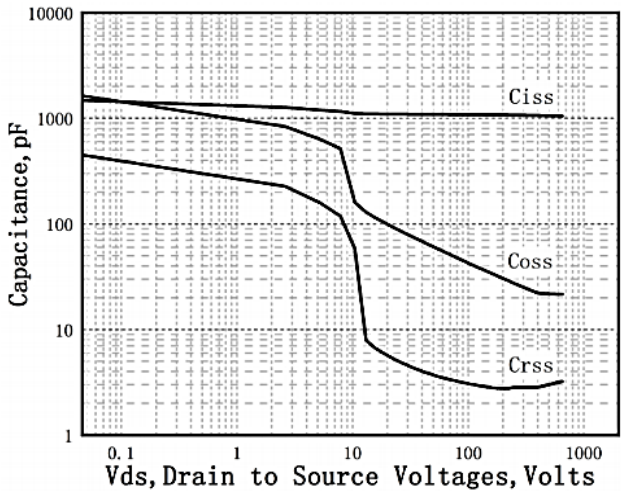


Figure 7. Capacitance Characteristics

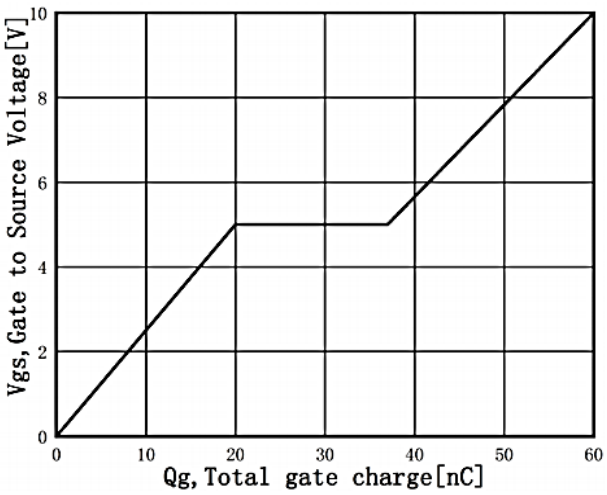


Figure 8. Gate Charge Characteristics

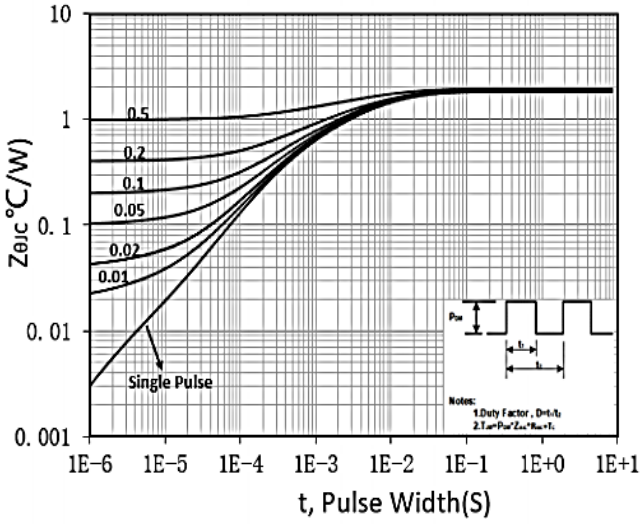


Figure 9. Maximum Safe Operating Area
(TO-220F)

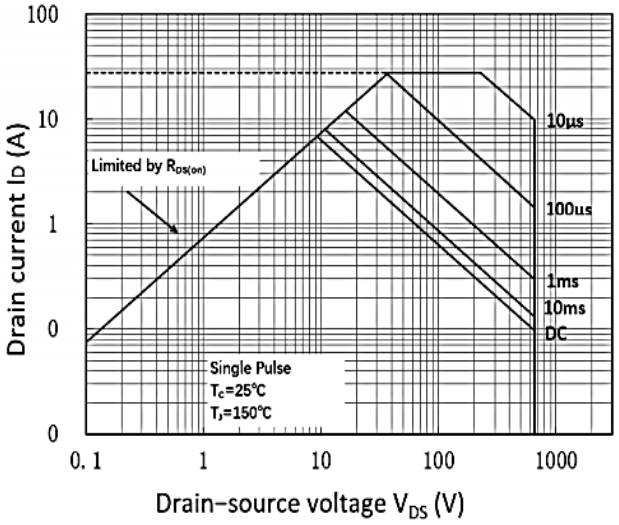
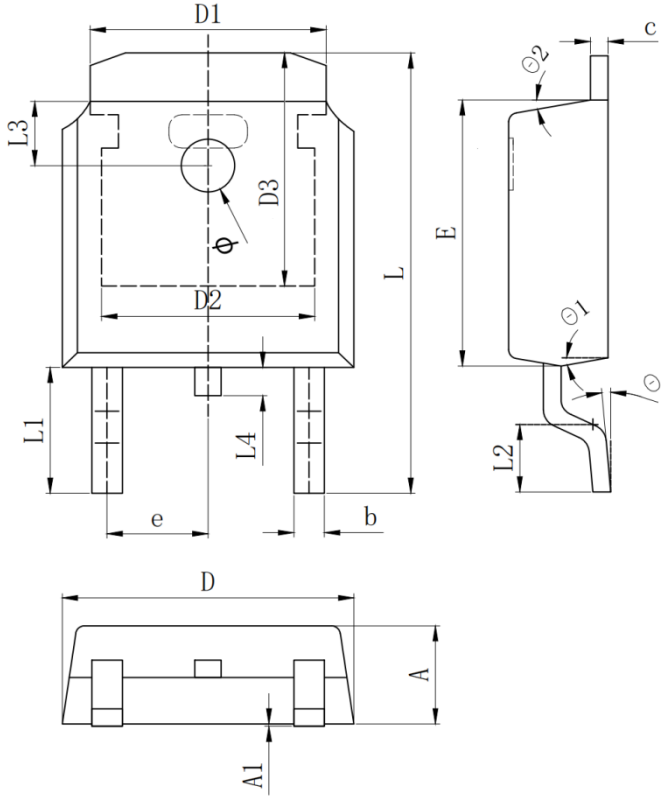


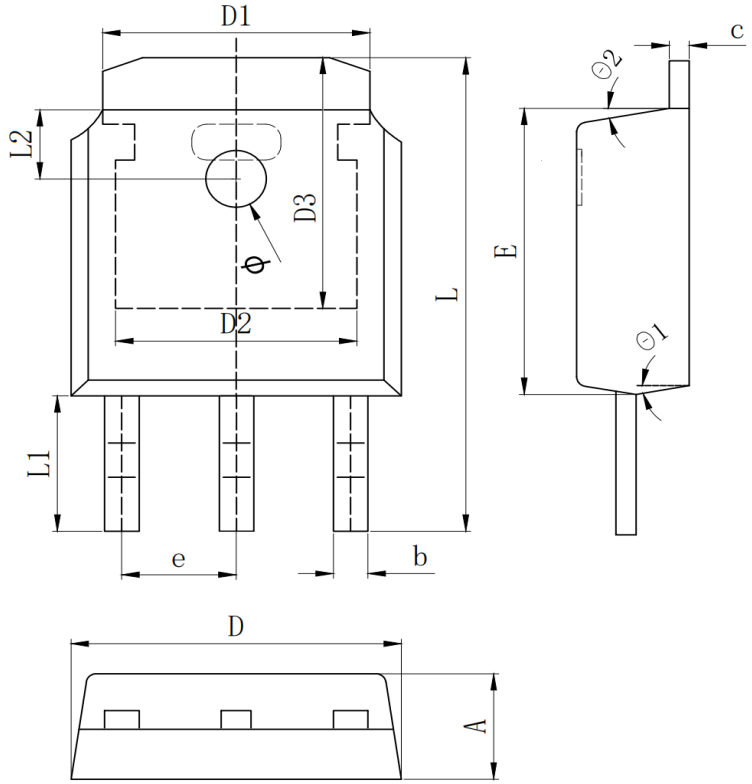
Figure 10. Transient Thermal Response Curve
(TO-220F)

Package Mechanical Data-TO252-3L



Symbol	Dimensions In Millimeters		
	min.	typ.	max.
A	2.10	2.30	2.50
A1	0.00	0.064	0.128
b	0.64	0.75	0.86
c	0.45	0.52	0.60
D	6.40	6.60	6.80
D1	5.33REF		
D2	4.83REF		
D3	5.25REF		
E	5.90	6.10	6.30
e	2.286TYP		
L	9.80	10.10	10.40
L1	2.888REF		
L2	1.40	1.50	1.70
L3	1.65REF		
L4	0.60	0.80	1.00
ϕ	1.10	1.20	1.30
θ	0°		10°
θ1	5°		10°
θ2	5°		10°

Package Mechanical Data-TO251S-3L



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D3	5.25REF		
E	5.90	6.10	6.30
e	2.286TYP		
L	10.90	11.20	11.50
L1	4.0REF		
L2	1.65REF		
ϕ	1.10	1.20	1.30
θ1	5°		10°
θ2	5°		10°

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Edition	Date	Change
REV1.0	2024/1/31	Initial release

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