

APJ30N65F/P/T (AP65R340)

650V N-Channel Enhancement Mode MOSFET

Description

The APJ30N65F/P/T is **CoolFET II** MOSFET family that is utilizing charge balance technology for extremely low on-resistance and low gate charge performance.

APJ14N65F/P/T is suitable for applications which require superior power density and outstanding efficiency

General Features

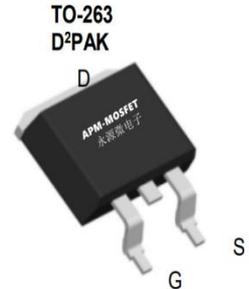
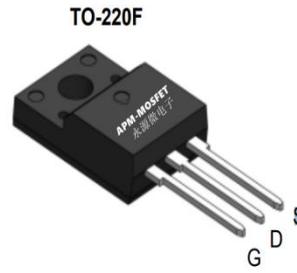
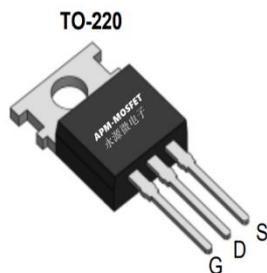
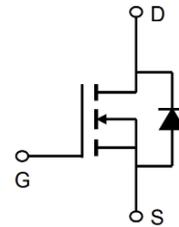
$V_{DS} = 650V$ (Type: 740V) $I_{DM} = 30A$

$R_{DS(ON)} < 340m\Omega$ @ $V_{GS}=10V$ (Type: 280m Ω)

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
APJ30N65F	TO-220F-3L	AP65R340F XXX YYYY	1000
APJ30N65P	TO-220-3L	AP65R340P XXX YYYY	1000
APJ30N65T	TO-263-3L	AP65R340T XXX YYYY	1000

Absolute Maximum Ratings ($T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage ($V_{GS} = 0V$)	650	V
I_D	Continuous Drain Current	14	A
I_{DM}	Pulsed Drain Current (note1)	30	A
V_{GS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy (note2)	250	mJ
P_D	Power Dissipation ($T_c = 25^\circ C$)	25.5	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-55~+150	$^\circ C$
R_{thJC}	Thermal Resistance, Junction-to-Case	1.2	$^\circ C/W$
R_{thJA}	Thermal Resistance, Junction-to-Ambient	62	$^\circ C/W$



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

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain to source breakdown voltage	V _{GS} =0V, I _D =250uA	650	740	--	V
ΔBV _{DSS} / ΔT _J	Breakdown voltage temperature coefficient	I _D =250uA, referenced to 25°C	--	0.7	--	V/°C
IDSS	Drain to source leakage current	V _{DS} =650V, V _{GS} =0V	--	--	1	uA
		V _{DS} =520V, T _C =125°C	--	--	50	uA
IGSS	Gate to source leakage current, forward	V _{GS} =30V, V _{DS} =0V	--	--	100	nA
	Gate to source leakage current, reverse	V _{GS} =-30V, V _{DS} =0V	--	--	-100	nA
VGS(TH)	Gate threshold voltage	V _{DS} =V _{GS} , I _D =250uA	2.5	3.3	4.5	V
RDS(ON)	Drain to source on state resistance	V _{GS} =10V, I _D =3.2A	--	280	340	mΩ
Ciss	Input capacitance	V _{GS} =0V, V _{DS} =100V, f=1MHz	--	781	--	pF
Coss	Output capacitance		--	30.3	--	
Crss	Reverse transfer capacitance		--	1.47	--	
td(on)	Turn on delay time	V _{DS} =400V, I _D =7A, R _G =4.7Ω, V _{GS} =10V	--	6.2	--	ns
t _r	Rising time		--	21	--	
td(off)	Turn off delay time		--	28.8	--	
t _f	Fall time		--	22.4	--	
Q _g	Total gate charge	V _{DS} =400V, V _{GS} =10V, I _D =7A	--	2.77	--	nC
Q _{gs}	Gate-source charge		--	5.8	--	
Q _{gd}	Gate-drain charge		--	20.4	--	
IS	Continuous source current	Integral reverse p-n Junction diode in the MOSFET	--	--	14	A
ISM	Pulsed source current		--	--	44	A
VSD	Diode forward voltage drop.	I _S =7A, V _{GS} =0V	--	0.7	1.5	V
T _{rr}	Reverse recovery time	I _S =7A, V _{GS} =0V, V _{dd} =400V, di _F /dt=100A/us,	--	218	--	ns
Q _{rr}	Reverse recovery Charge		--	1.1	--	uC

Note :

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- The EAS data shows Max. rating . L=0.5mH, I_{AS} =7A, V_{DD} =50V, R_G=25Ω
- The test condition is Pulse Test: I_{SD} ≤ I_D, di/dt = 100A/us, V_{DD} ≤ BVDSS, Starting at T_J =25°C
- The power dissipation is limited by 150°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.

Typical Characteristics

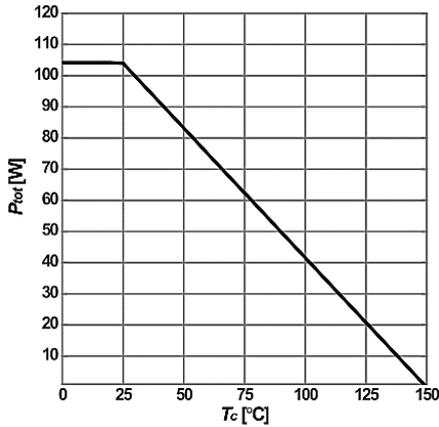


Figure1: Power dissipation (Non FullPAK)

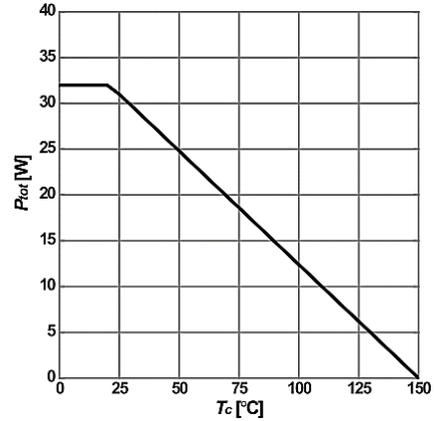


Figure2: Power dissipation (FullPAK)

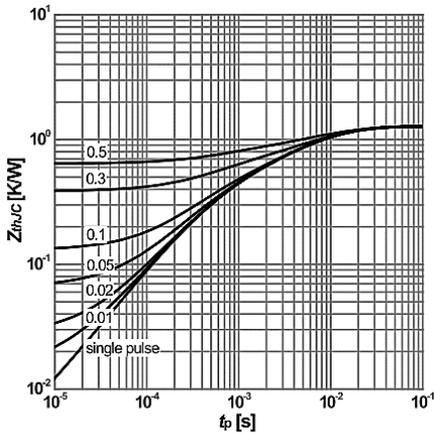


Figure3: Max. transient thermal impedance
 $Z_{thJC}=f(t_p)$; parameter: $D= t_p/T$

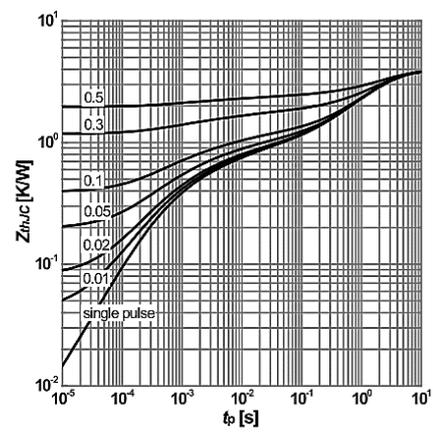


Figure4: Max. transient thermal impedance
 $Z_{thJC}=f(t_p)$; parameter: $D= t_p/T$

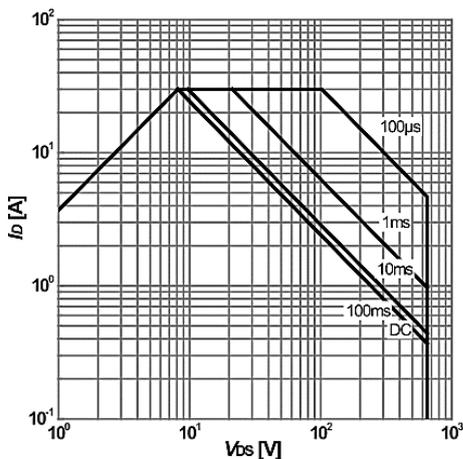


Figure5: Safe operating area (Non FullPAK)
 $I_D=f(V_{DS})$; $T_J=25^\circ\text{C}$; $D=0$; parameter: t_p

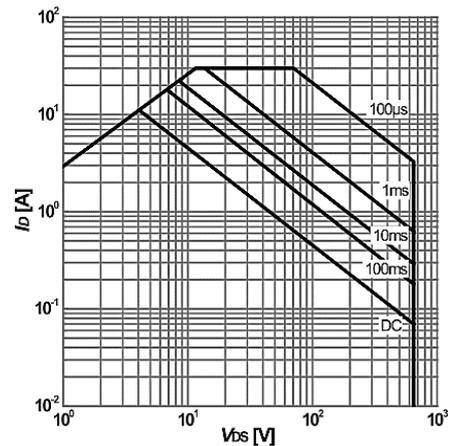


Figure6: Safe operating area (FullPAK)
 $I_D=f(V_{DS})$; $T_J=25^\circ\text{C}$; $D=0$; parameter: t_p

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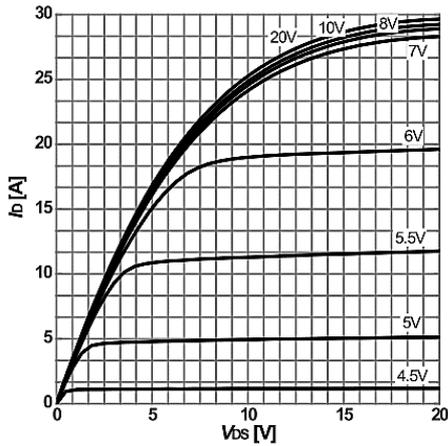


Figure 7: Typ. output characteristics
 $I_D=f(V_{DS}); T_J=25^{\circ}\text{C};$ parameter: V_{GS}

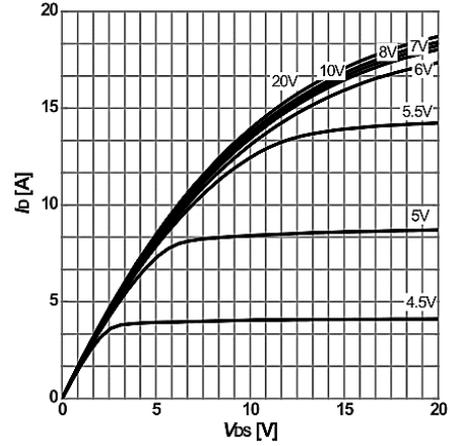


Figure 8: Typ. output characteristics
 $I_D=f(V_{DS}); T_J=125^{\circ}\text{C};$ parameter: V_{GS}

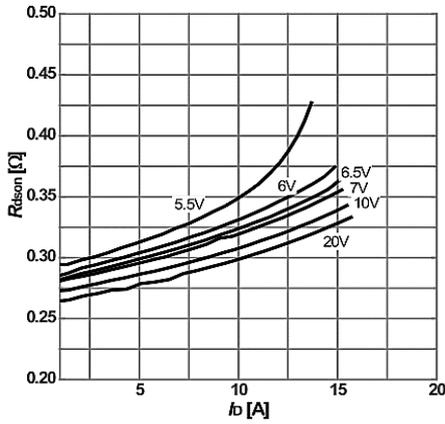


Figure 9: Typ. drain-source on-state resistance
 $R_{DS(on)}=f(I_D); T_J=25^{\circ}\text{C};$ parameter: V_{GS}

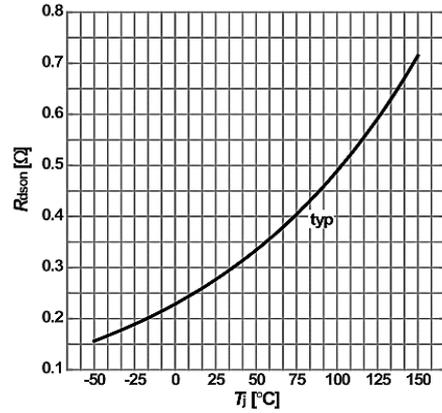


Figure 10: drain-source on-state resistance
 $R_{DS(on)}=f(T_J); I_D=3.2\text{A}; V_{GS}=10\text{V}$

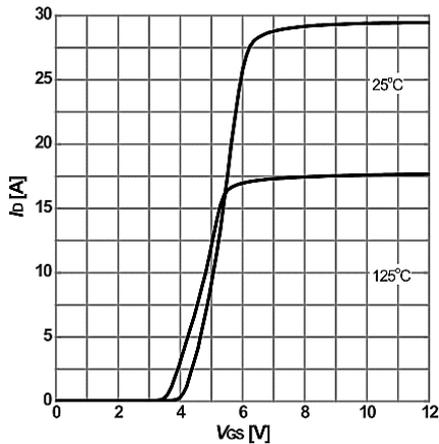


Figure 11: Type. transfer characteristics
 $I_D=f(V_{GS}); V_{DS}=20\text{V};$ parameter: T_J

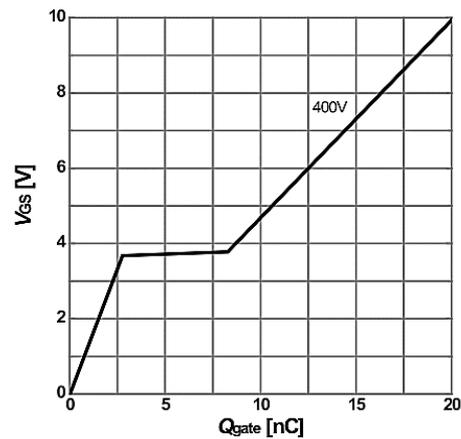
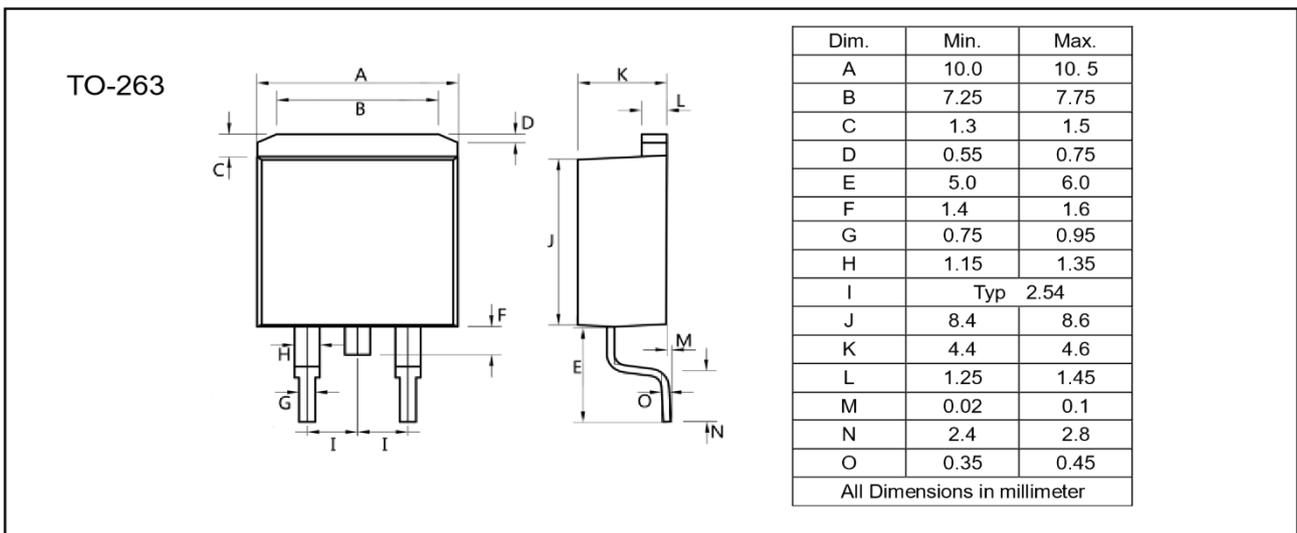
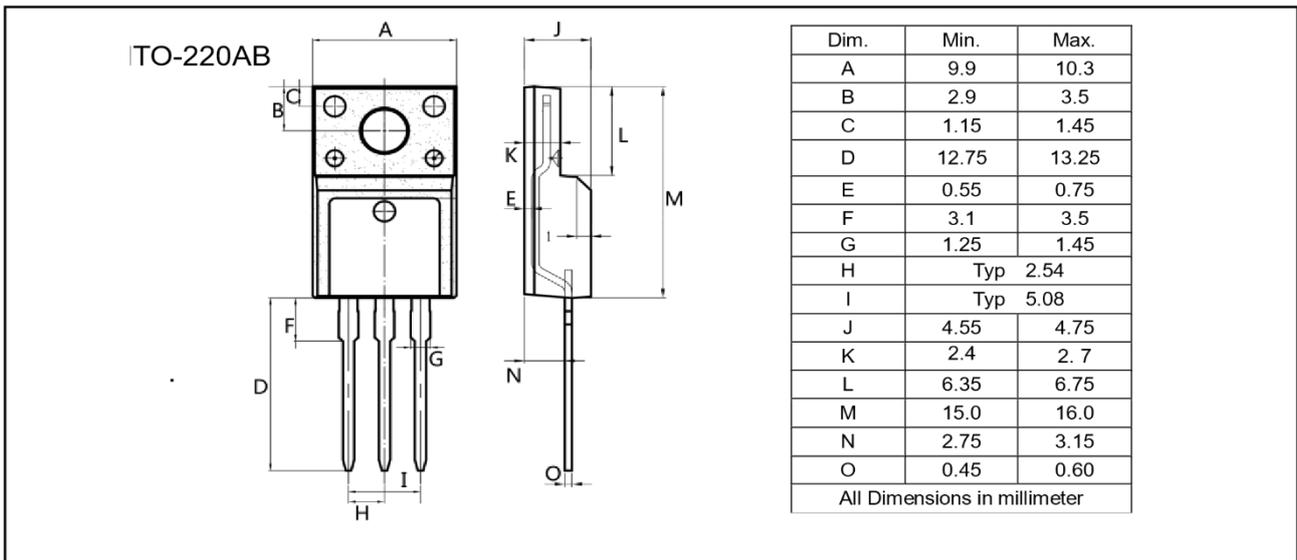
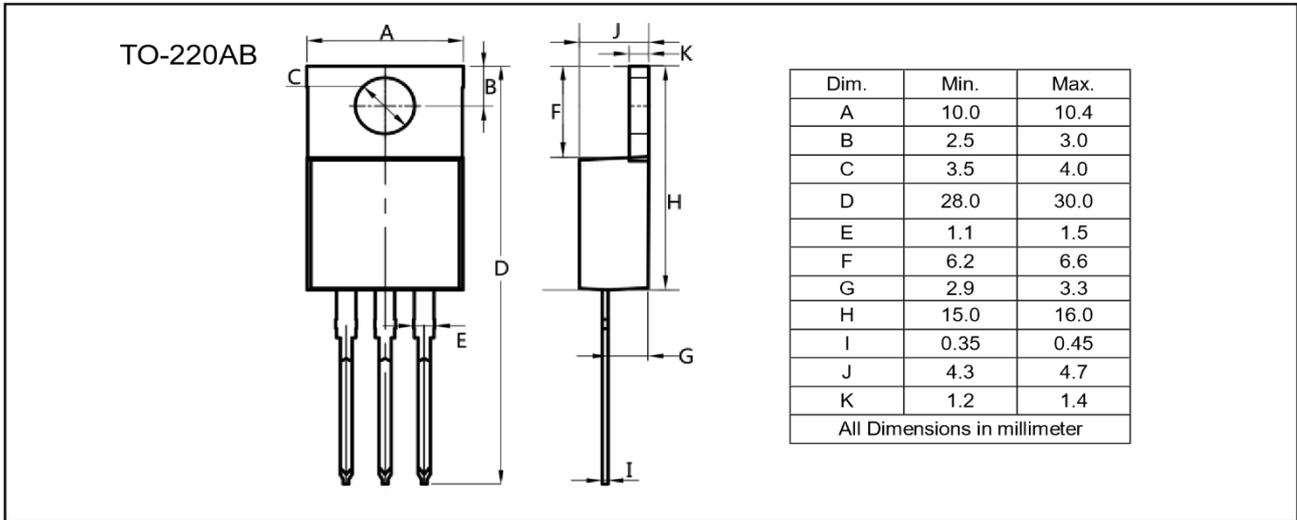


Figure 12: Type. gate charge
 $V_{GS}=f(Q_{gate}); I_D=3.2\text{A pulsed}; V_{DS}=480\text{V}$

Package Mechanical Data-TO-X



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Edition	Date	Change
Rve1.0	2018/1/31	Initial release

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