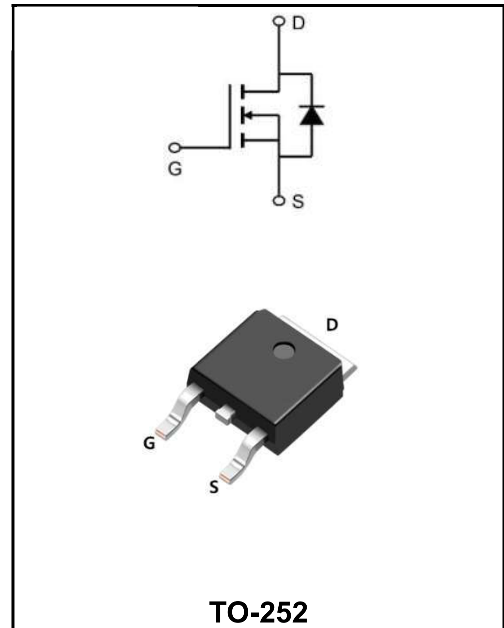
650V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	10A
V_{DSS}	650V(Type:720V)
R_{DSON}-typ(@V_{GS}=10V)	＜950mΩ(Type:860mΩ)



Features

- Is CoolFET II MOSFET

Application

- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)

Product Specification Classification

Part Number	Package	Marking	Pack
YFWJ10N65AD	TO-252	YFW J10N65AD XXXXX	2500PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage (V_{GS} = 0V)	V_{DS}	650	V
Continuous Drain Current	I_D	10	A
Pulsed Drain Current(note1)	I_{DM}	30	A
Gate - Source Voltage	V_{GS}	±30	V
Single Pulse Avalanche Energy(note2)	E_{AS}	125	mJ
Power Dissipation(T_A=25℃)	P_D	25.5	W
Operating Junction and Storage Temperature Range	T_J ,T_{STG}	-55 to +150	°C
Thermal Resistance, Junction-to-case	$R_{θJC}$	4.9	°C/W
Thermal Resistance, Junction ambient	$R_{θJA}$	49	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	BV_{DSS}	650	720	-	V
Breakdown voltage temperature coefficient	Reference to 25℃ , I_D=250μA	$\triangle BV_{DSS/\triangle TJ}$	-	0.7	-	V/°C
Drain -Source Leakage Current	V_{DS}=650V , V_{GS}=0V	I_{DSS}	-	-	1	μA
	V_{DS}=520V , T_C=125℃		-	-	50	
Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V	I_{GSS}	-	-	100	nA
Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V		-	-	-100	
Gate- Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	$V_{GS(th)}$	2.5	3.3	4.5	V
Drain to source on state resistance	V_{GS}=10V, I_D=3.2A	$R_{DS(ON)}$	-	860	950	mΩ
Input Capacitance	V_{DS}=100V V_{GS}=0V f=1MHz	C_{iss}	-	263	-	pF
Output Capacitance		C_{oss}	-	13.7	-	
Reverse Transfer Capacitance		C_{rss}	-	1.06	-	
Turn-on delay time	V_{DS}=400V I_D=2.2A R_G=4.7Ω V_{GS}=10V	$t_{d(on)}$	-	12.8	-	nS
Rising time		T_r	-	26.4	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	22.2	-	
Fall Time		t_f	-	75.6	-	
Total Gate Charge	V_{DS}=480V I_D=2A V_{GS}=10V	Q_g	-	1.07	-	nC
Gate-Source Charge		Q_{gs}	-	3.63	-	
Gate-Drain Charge		Q_{gd}	-	7.72	-	
Continuous source current	Integral reverse p-n Junction diode in the MOSFET	I_S	-	-	5	A
Pulsed source curren		I_{SM}	-	-	15	
Diode forward voltage drop.	I_S = 3.2A, V_{GS} = 0V	V_{SD}	-	0.7	1.5	V
Reverse Recovery Time	V_{GS} = 0V,I_S = 3.2A, V_{DS}=400V diF/dt =100A /μs	t_{rr}	-	313	-	nS
Reverse Recovery Charge		Q_{rr}	-	0.92	-	uC

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 . L=0.5mH, IAS =2.3A, VDD =50V, RG=25Ω

3、The test condition is Pulse Test: ISD ≤ ID, di/dt = 100A/us, VDD≤ BVDSS, Starting at TJ =25℃

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

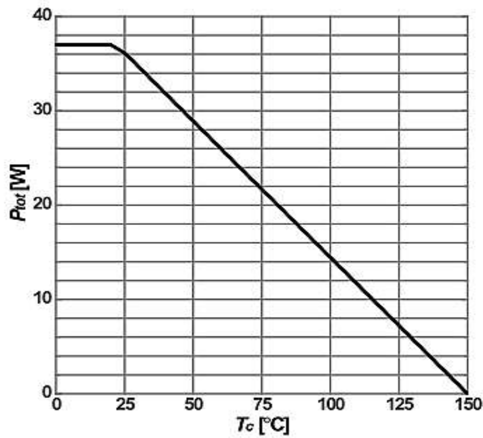


Figure1: Power dissipation (Non FullPAK)

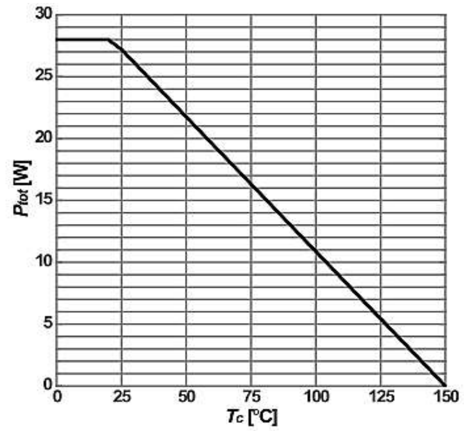


Figure2: Power dissipation (FullPAK)

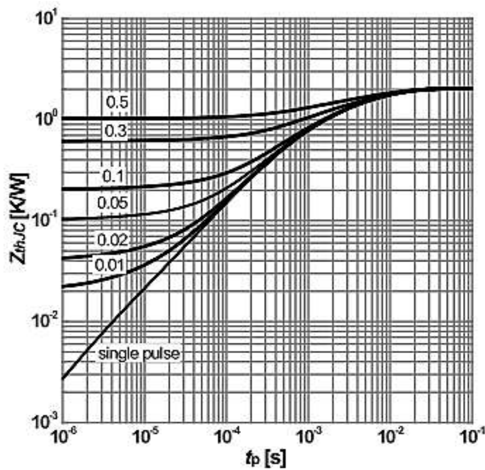


Figure3:Max. transient thermal impedance

Z_{thJC}=f(t_p); parameter: D= t_p/T

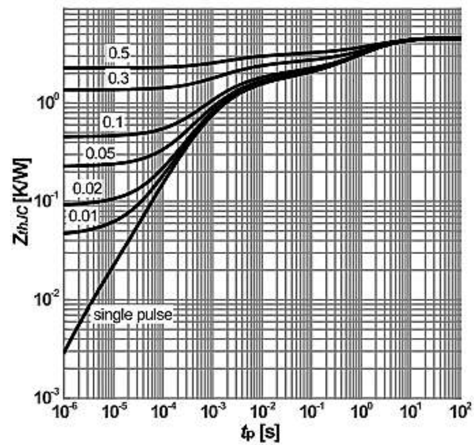


Figure4:Max. transient thermal impedance

Z_{thJC}=f(t_p); parameter: D= t_p/T

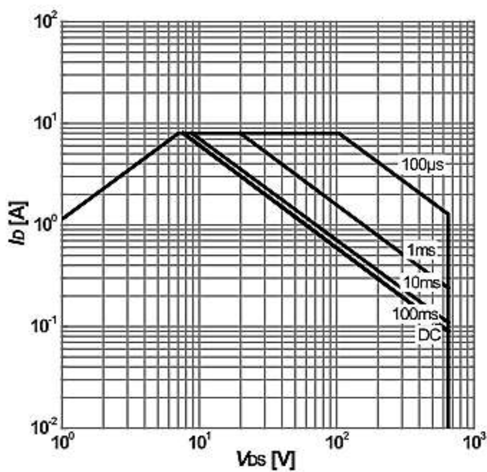


Figure5: Safe operating area (Non FullPAK)

I_D=f(V_{DS}); T_j=25°C; D=0; parameter: t_p

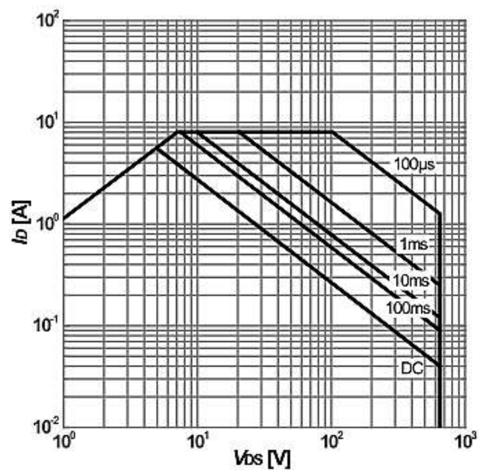


Figure6: Safe operating area (FullPAK)

I_D=f(V_{DS}); T_j=25°C; D=0; parameter: t_p

Ratings and Characteristic Curves

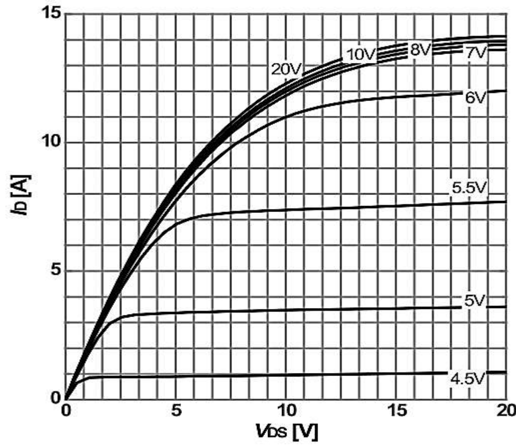


Figure 7: Typ. outp ut characteristics

I_D=f(V_{DS}); T_j=25°C; parameter: V_{GS}

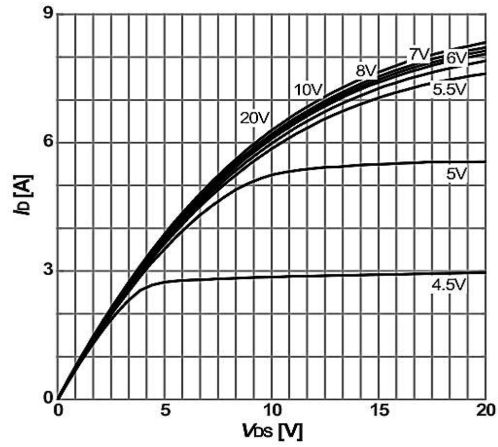


Figure8 : Typ. output characteristics

I_D=f(V_{DS}); T_j=125°C; parameter: V_{GS}

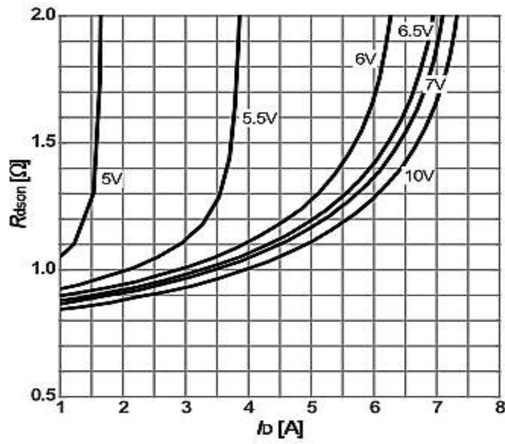


Figure9 : Typ. drain-source on-state resistance

R_{DS}(on)=f(I_D); T_j=25°C; parameter: V_{GS}

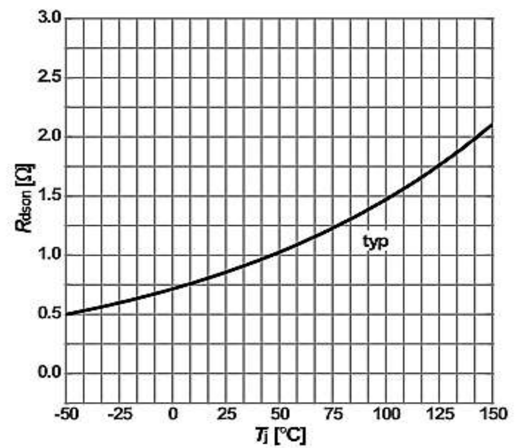


Figure 10: drain -source on-state resistance

R_{DS}(on)=f(T_j); I_D=3.2A; V_{GS}=10V

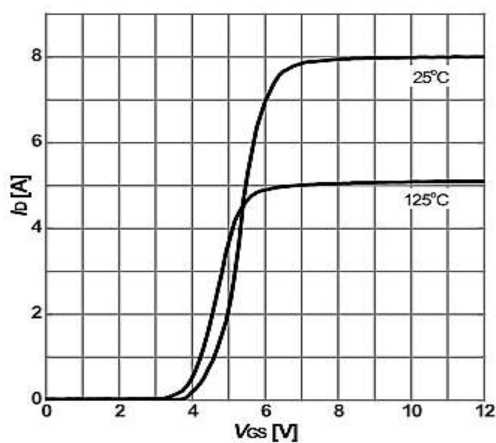


Figure 11: Type. transfer characteristics

I_D=f(V_{GS}); V_{DS}=20V; parameter: T_j

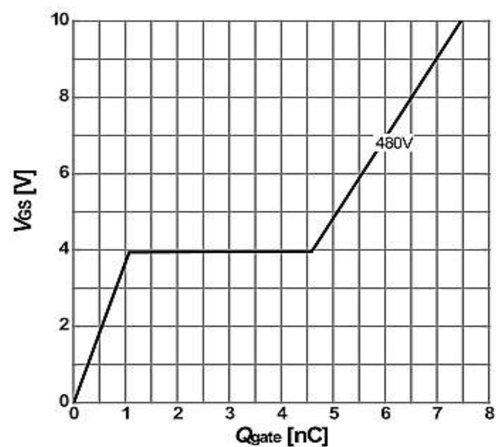


Figure 12: Type. gate charge

V_{GS}=f(Q_{gate}); I_D=3.2A pulsed; V_{DS}=480V

Package Outline Dimensions Millimeters

TO-252

Dim.	Min.	Typ.	Max.
A	2.10	-	2.50
A2	0	-	0.10
B	0.66	-	0.86
B2	5.18	-	5.48
C	0.40	-	0.60
C2	0.44	-	0.58
D	5.90	-	6.30
D1	5.30REF		
E	6.40	-	6.80
E1	4.63	-	-
G	4.47	-	4.67
H	9.50	-	10.70
L	1.09	-	1.21
L2	1.35	-	1.65
V1	-	7°	-
V2	0°	-	6°

All Dimensions in millimeter