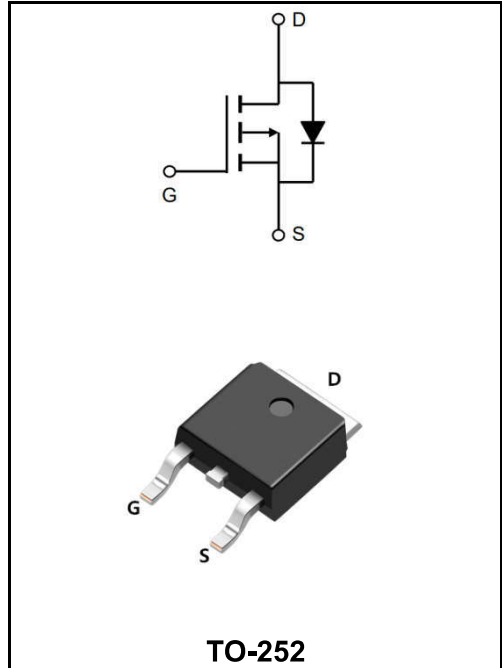


-40V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-40A
V_{DSS}	-40V
R_{DS(on)-typ(@V_{GS}=-10V)}	< 18mΩ(Type: 15 mΩ)



Application

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW40P04AD	TO-252	YFW 40P04AD XXXXX	2500PCS/Tape

Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	-40	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V _{GS} @ -10V ¹ @T _c =25°C	I_D	-40	A
Continuous Drain Current, V _{GS} @ -10V ¹ @T _c =100°C	I_D	-23	A
Pulsed Drain Current ²	I_{DM}	-120	A
Single Pulse Avalanche Energy ³	E_{AS}	125	mJ
Total Power Dissipation ⁴ @T _c =25°C	P_D	25	W
Total Power Dissipation ⁴ @T _A =25°C	P_D	16	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction-Ambient ¹	R_{θJA}	62	°C/W
Thermal Resistance Junction to Case ¹	R_{θJC}	5	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-40	-44	-	V
BV_{DSS} Temperature Coefficient	Reference to 25°C, $I_D=-1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	-0.023	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=-10V, I_D=-30A$	$R_{DS(ON)}$	-	15	18	mΩ
	$V_{GS}=-4.5V, I_D=-20A$		-	18	25	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.0	-1.6	-2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	4.74	-	mV/°C
Drain-Source Leakage Current	$V_{DS}=-40V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
	$V_{DS}=-40V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate -Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Total Gate Charge(-4.5V)	$V_{DS}=-20V$ $V_{GS}=-4.5V$ $I_D=-12A$	Q_g	-	25	-	nC
Gate-Source Charge		Q_{GS}	-	11	-	
Gate-Drain Charge		Q_{gd}	-	9.5	-	
Turn-on delay time	$V_{DD}=-15V$ $R_L=15\Omega$ $I_D=-1A$ $V_{GEN}=-10V$ $R_G=6\Omega$	$t_{d(on)}$	-	48	-	ns
Rise Time		T_r	-	24	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	88	-	
Fall Time		t_f	-	9.6	-	
Input Capacitance	$V_{DS}=-20V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	2760	-	pF
Output Capacitance		C_{oss}	-	260	-	
Reverse Transfer Capacitance		C_{rss}	-	85	-	
Continuous Source Current ^{1,5}	$V_G=V_D=0V, \text{Force Current}$	I_S	-	-	-40	A
Pulsed Source Current ^{2,5}		I_{SM}	-	-	-90	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	V_{SD}	-	-	-1.3	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 $\cong 300\mu s$, duty cycle $\cong 2\%$
- 3、The EAS data shows Max. rating . The test condition is $V_{DD}=-32V, V_{GS}=-10V, L=0.1mH, I_{AS}=-30A$
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

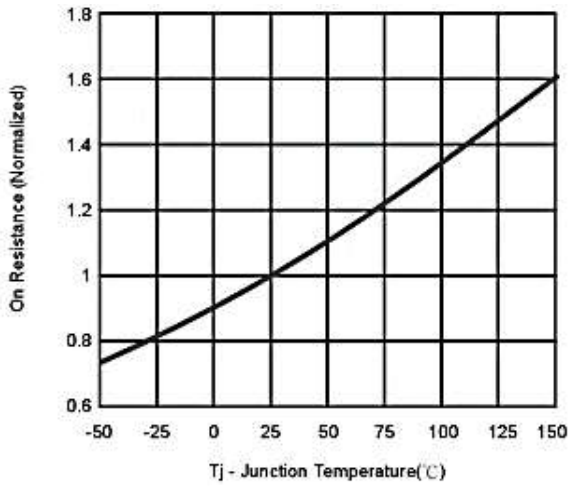


Fig.1 On Resistance Vs Junction Temperature

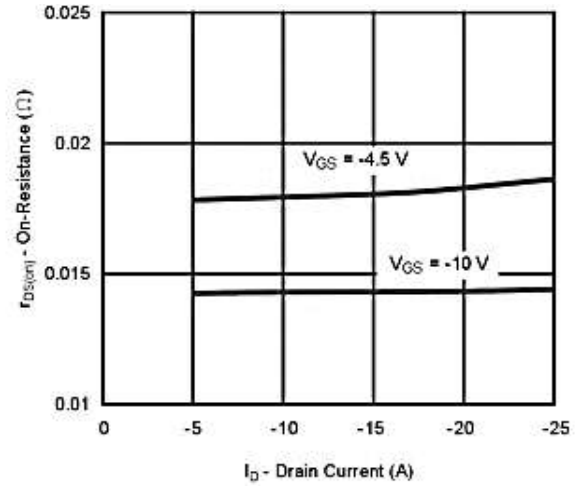


Fig.2 On-Resistance Vs. Drain Current

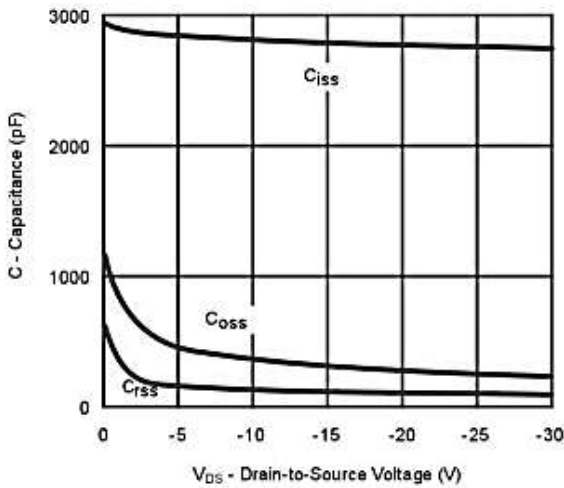


Fig.3 Capacitance

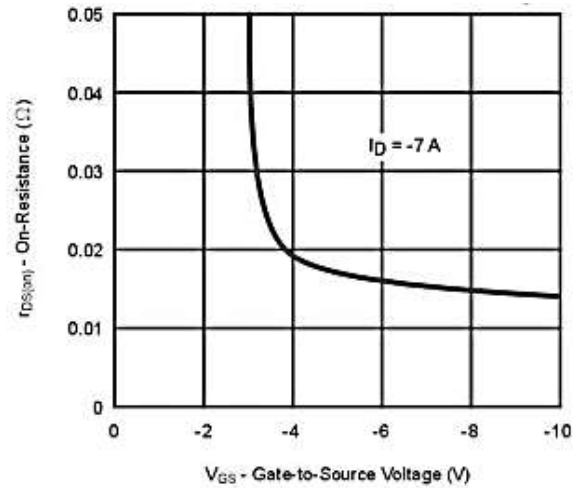


Fig.4 On-Resistance Vs. Gate-to-Source Voltage

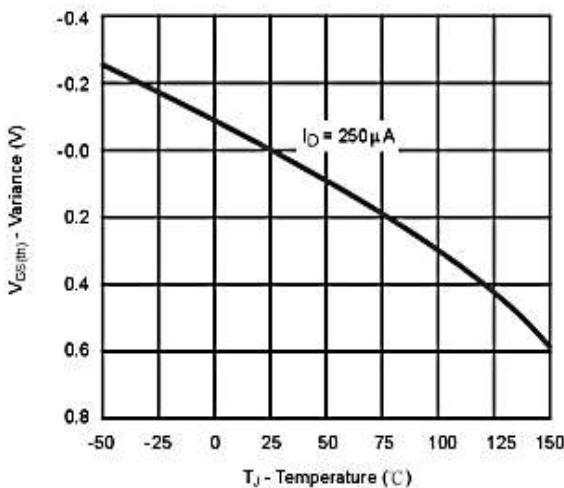


Fig.5 Threshold Voltage

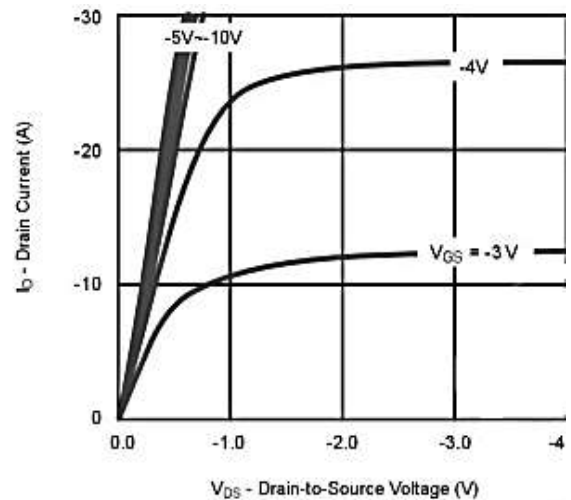


Fig.6 On-Region Characteristics

Ratings and Characteristic Curves

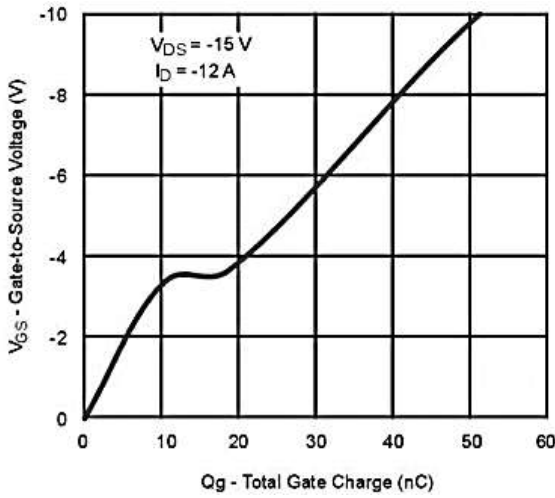


Fig.7 Gate Charge

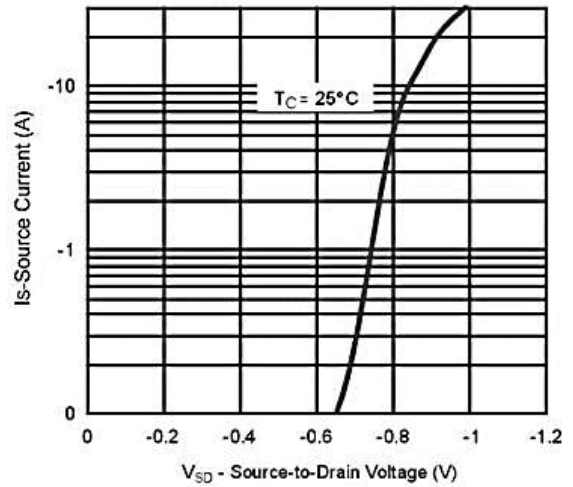


Fig.8 Body-diode Characteristic

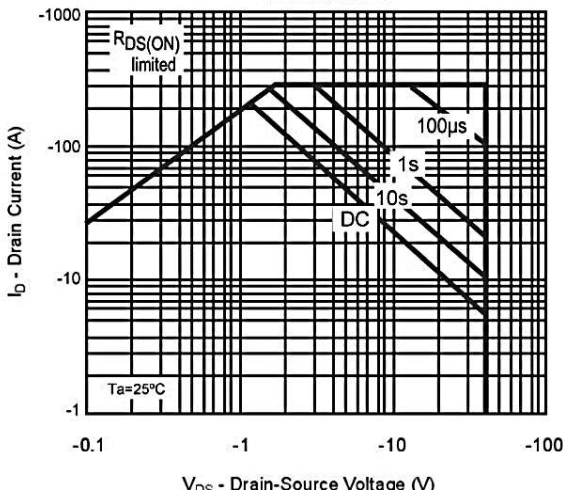


Fig.9 Safe Operating Area

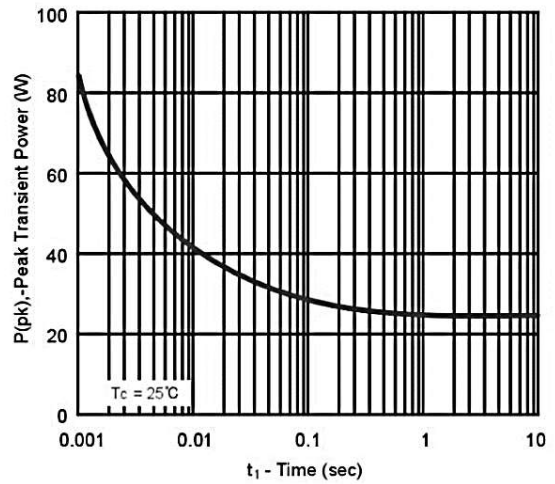


Fig.10 Single Pluse Maximum Power Dissipation

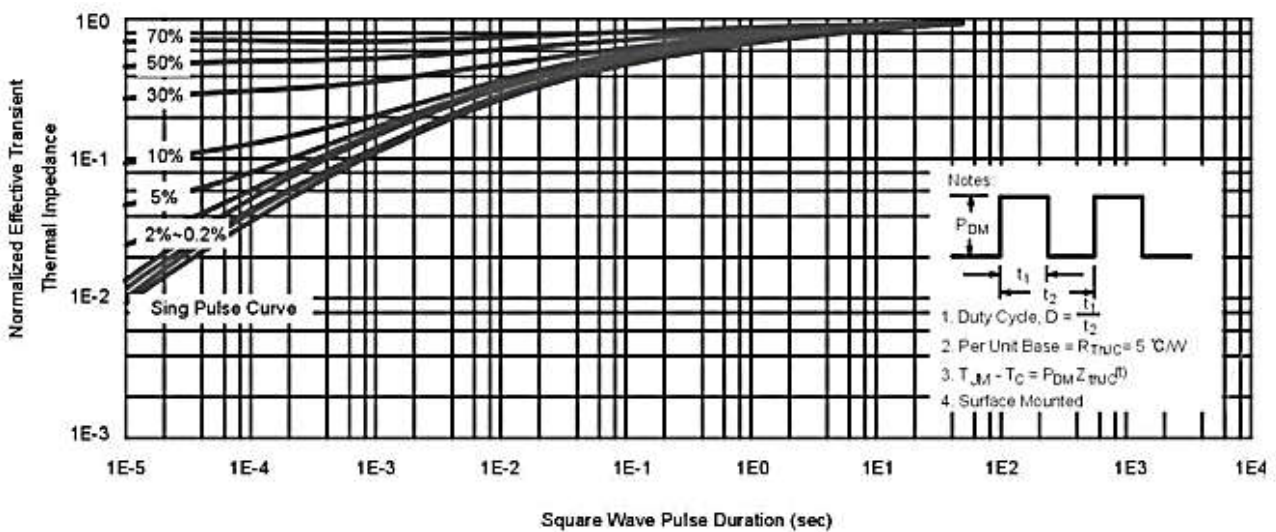
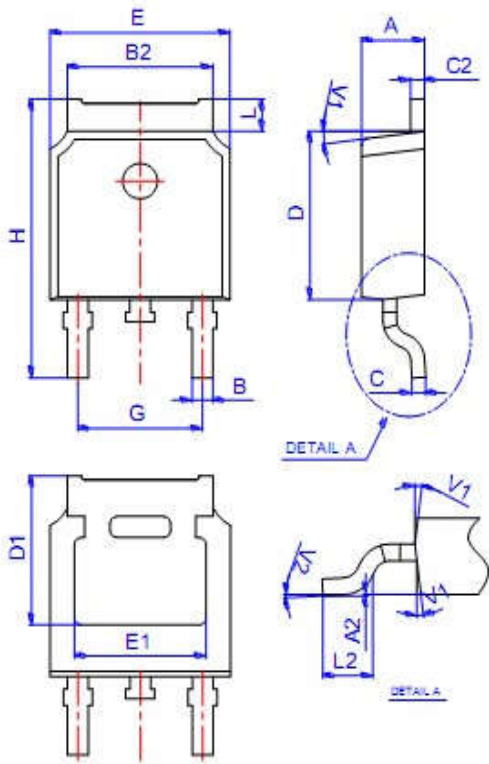


Fig.11 Normalized Maximum Transient Thermal Impedance

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			



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