

400V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	5A
V_{DSS}	400V
$R_{DS(on)-typ}(@V_{GS}=10V)$	<1.2 Ω (Type:1 Ω)

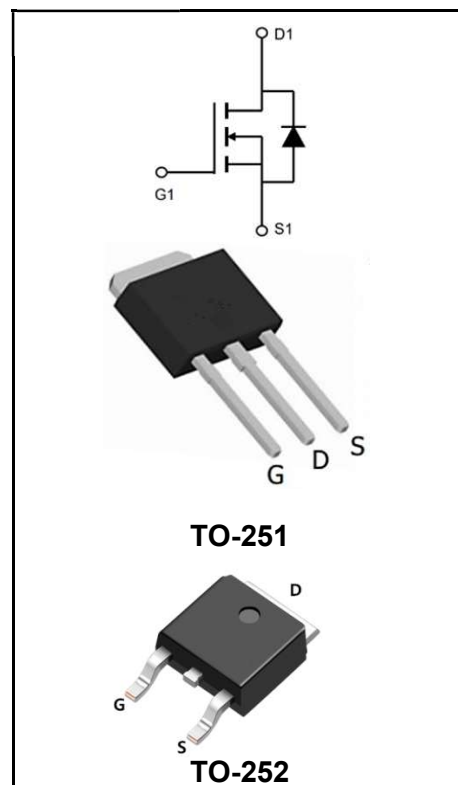
Features

- ♦Fast Switching
- ♦Low ON Resistance
- ♦Low Gate Charge
- ♦100% Single Pulse avalanche energy Test
- ♦LeadfreeincomplywithEURoHS2011/65/EUdirectives



Mechanical Data

- ♦Case: Molded plastic
- ♦Mounting Position: Any
- ♦Molded Plastic: UL Flammability Classification Rating 94V-0
- ♦Solder bath temperature275℃maximum,10s per JESD22-106



Product Specification Classification

Part Number	Package	Marking	Pack
YFW5N40AMJ	TO-251	YFW 5N40AMJ XXXXX	80PCS/Tube
YFW5N40AD	TO-252	YFW 5N40AD XXXXX	2500PCS/Tape

Maximum Ratings At Tc=25°C Unless Otherwise Specified

Characteristics	Symbols	Value	Units
		251/252	
Drain-Source Voltage	V_{DS}	400	V
Gate-Source Voltage	V_{GS}	± 30	V
Continue Drain Current	I_D	5	A
- Continuous(Tc=100°C)		3.1	
Pulsed Drain Current (Note1)	I_{DM}	20	A
Power Dissipation	P_D	62	W
-Derate above 25°C		0.42	W/°C
Single Pulse Avalanche Energy (Note2)	E_{AS}	180	mJ
Avalanche Current (Note 1)	I_{AR}	5	A
Repetitive Avalanche Energy (Note 1)	E_{AR}	8.5	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	82	°C/W

Maximum Ratings At Tc=25°C Unless Otherwise Specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	400	-	-	V
Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$ (Referenced to 25°C)	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	-	0.65	-	V/°C
Drain-Source Leakage Current	$V_{DS} = 400\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
	$V_{DS} = 400\text{ V}, T_C = 125^\circ\text{C}$		-	-	10	μA
Gate Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}$	$R_{DS(on)}$	-	1	1.2	Ω
Forward Transconductance	$V_{DS} = 15\text{ V}, I_D = 2.5\text{ A}$	g_{fs}	-	4.6	-	S
Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V},$ $f = 1\text{ MHz}$	C_{iss}	-	462	-	pF
Output Capacitance		C_{oss}	-	71	-	
Reverse Transfer Capacitance		C_{rss}	-	5.1	-	
Turn-on Delay Time	$I_D = 5\text{ A}, V_{DD} = 200\text{ V},$ $R_G = 10\text{ }\Omega$ (Note3,4)	$t_d(ON)$	-	14	-	nS
Rise Time		t_r	-	20	-	
Turn-Off Delay Time		$t_d(OFF)$	-	31	-	
Fall Time		t_f	-	12	-	
Total Gate Charge	$I_D = 5\text{ A}, V_{DD} = 320\text{ V},$ $V_{GS} = 10\text{ V}$ (Note3,4)	Q_G	-	12.6	-	nC
Gate to Source Charge		Q_{GS}	-	4.1	-	
Gate to Drain Charge		Q_{GD}	-	4	-	

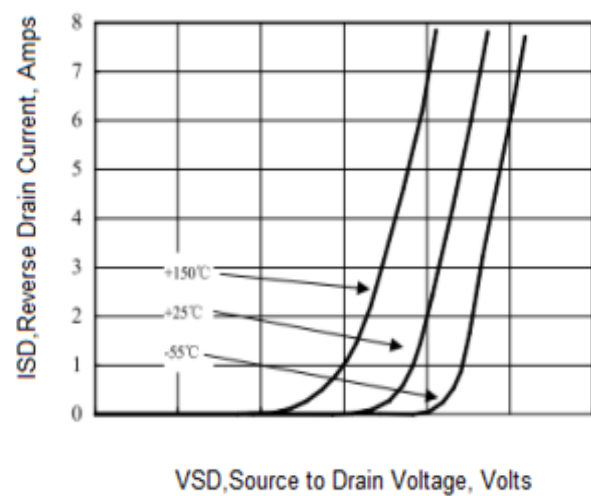
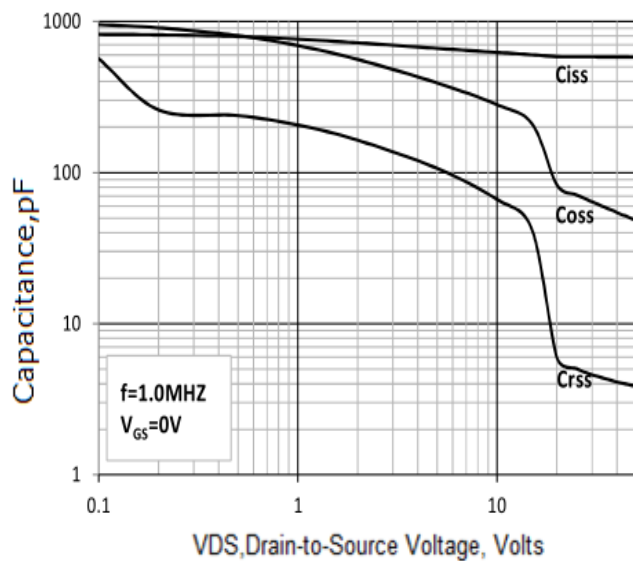
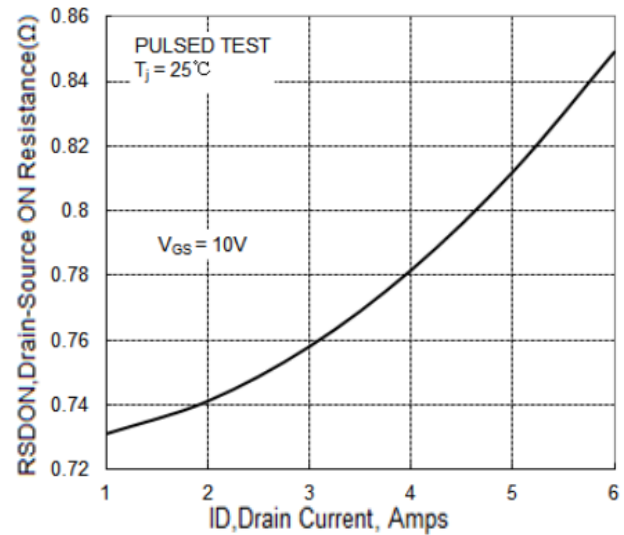
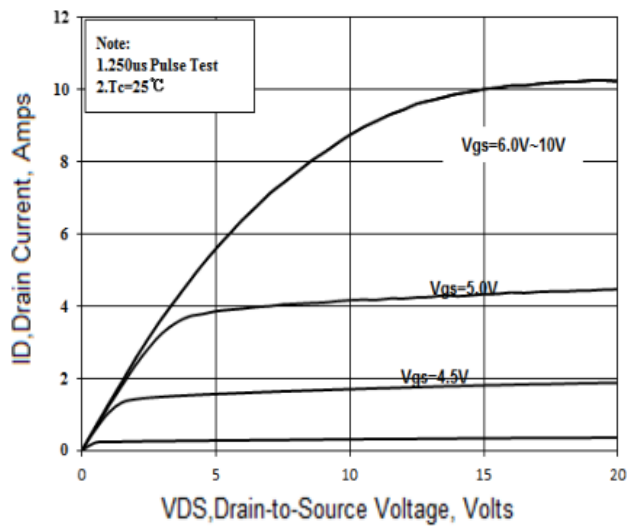
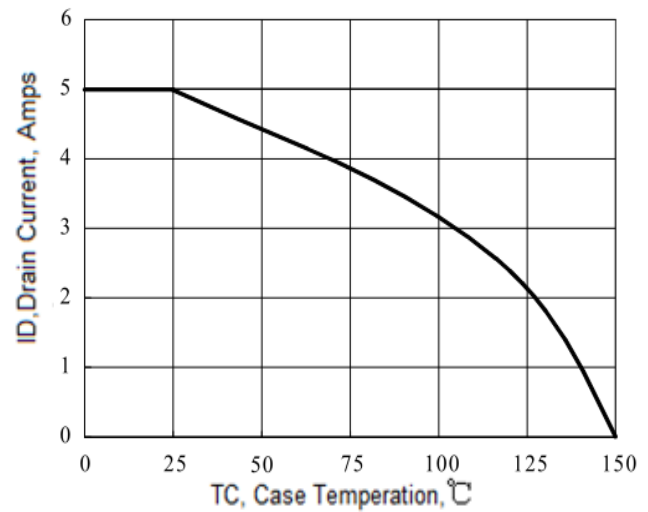
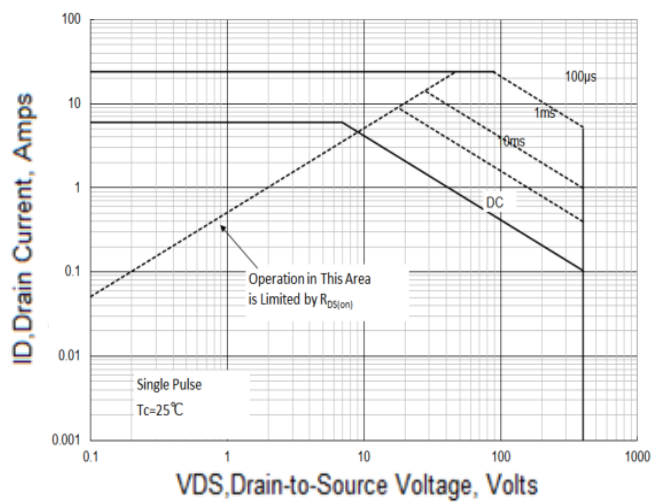
Source-Drain Diode Characteristics At Ta=25°C Unless Otherwise Specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximun Body-Diode Continuous Current		I_S	-	-	5	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	24	A
Drain-Source Diode Forward Voltage	I_{SD} = 5 A	V_{SD}	-	-	1.5	V
Reverse Recovery Time	I_{SD} =5 A, V_{GS} = 0 V, dI_F / dt = 100 A/μs	trr	-	240	-	nS
Reverse Recovery Charge		Qrr	-	1.2	-	uC

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. IAS = 5 A, VDD = 50 V, L =15mH, RG = 25Ω, starting TJ = 25°C.
3. ulse test: Pulse Width ≤300 μ s, Duty Cycle≤2%.
4. Essentially Independent of Operating Temperature.

Ratings and Characteristic Curves



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				

TO-251

	Dim.	Min.	Max.
	A	2.2	2.4
	A2	0.95	1.15
	A3	0.45	0.65
	B	0.65	0.85
	C	0.45	0.55
	D	6.45	6.75
	D2	5.2	5.4
	E	5.8	6
	E2	0.95	1.25
	E	Typ 2.3	
	E1	Typ 4.6	
	L	4	4.2
	L1	1.2	1.5
All Dimensions in millimeter			