

40V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D		60A
V_{DSS}		40V
$R_{DS(on)}$ typ(@ $V_{GS}=10V$)	TO-252	< 8.5 mΩ (Type: 7.0 mΩ)
	TO-263	< 8.5 mΩ (Type: 7.3 mΩ)
	TO-220AB	< 8.5 mΩ (Type: 7.5 mΩ)

Features

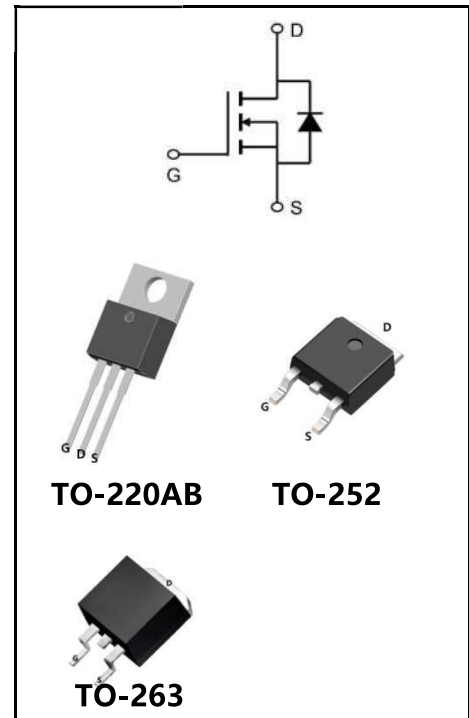
- ◆ Adopt advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.
- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

Mechanical Data

- ◆ Case: Molded plastic
- ◆ Mounting Position: Any
- ◆ Molded Plastic: UL Flammability Classification Rating 94V-0
- ◆ Solder bath temperature 275°C maximum, 10s per JESD22-106

Product Specification Classification

Part Number	Part Number	Marking	Pack
YFW60N04AT	TO-220AB	YFW 60N04AT XXXXX	1000PCS/Box
YFW60N04AS-G	TO-263	YFW 60N04AS XXXXX	1000PCS/Box
YFW60N04AS	TO-263	YFW 60N04AS XXXXX	800PCS/Reel
YFW60N04AD	TO-252	YFW 60N04AD XXXXX	2500PCS/Reel



Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
		252/263/220AB	
Drain-Source Voltage	VDS	40	V
Gate-Source Voltage	VGS	±20	V
Continue Drain Current	ID	60	A
Pulsed Drain Current (Note1)	IDM	125	A
Power Dissipation	PD	39	W
Single Pulse Avalanche Energy (Note1)	EAS	48	mJ
Operating Temperature Range	TJ	150	°C
Storage Temperature Range	TSTG	-55 to +150	°C
Thermal Resistance, Junction to Case	RθJC	3.6	°C/W
Thermal Resistance, Junction to Ambient	RθJA	62	°C/W

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Electrical Characteristics at Tc=25°C unless otherwise specified

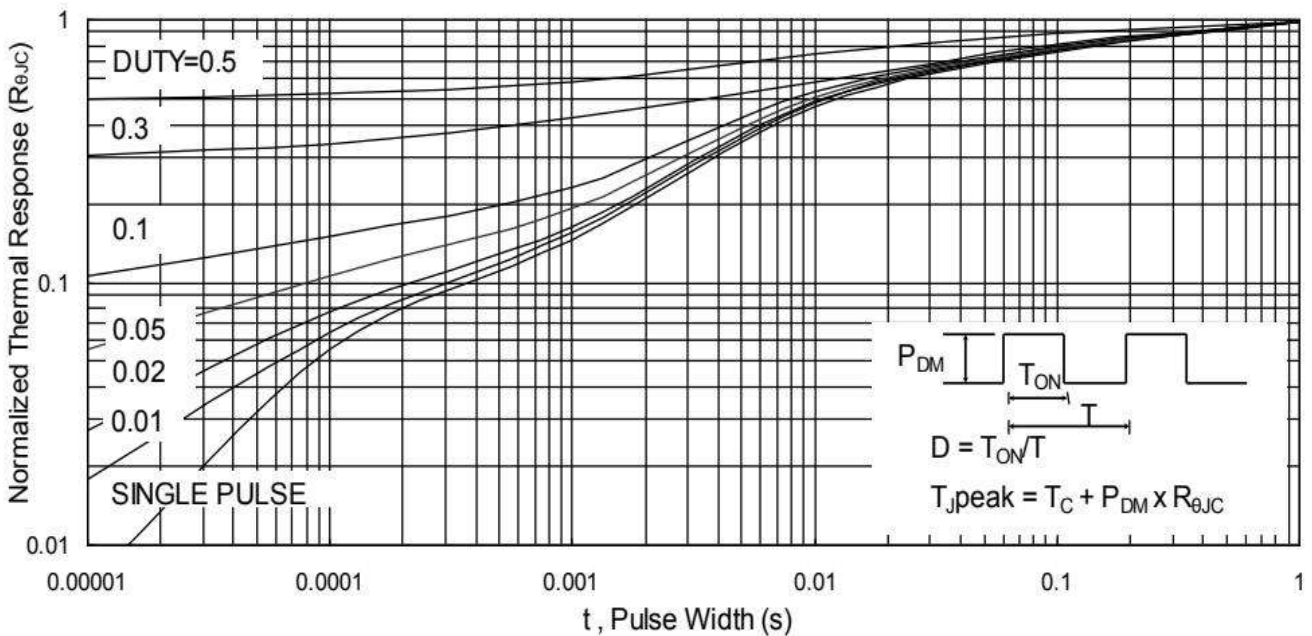
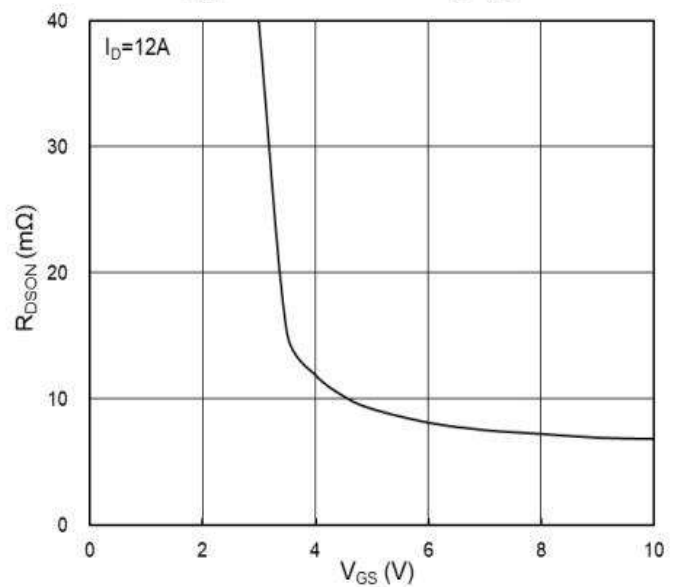
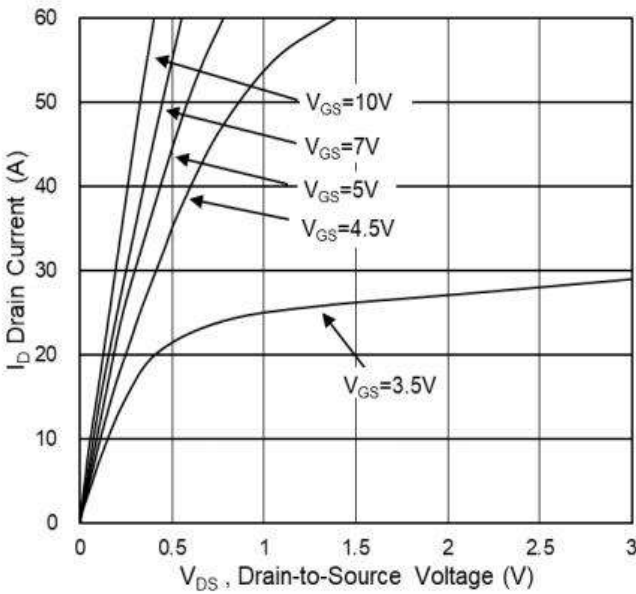
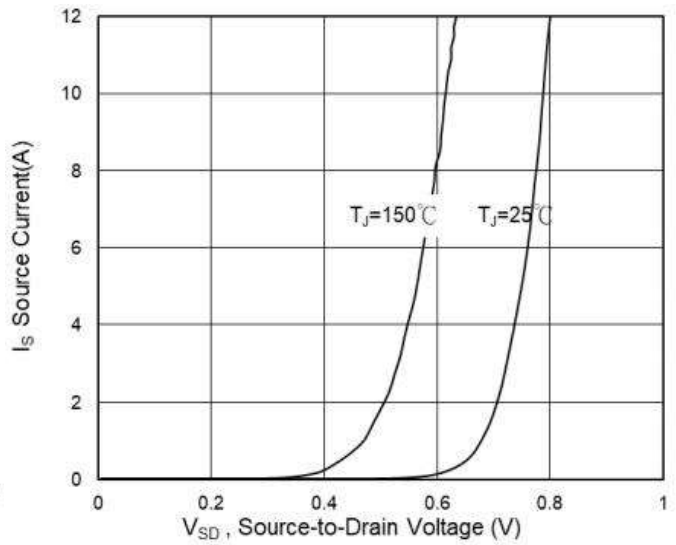
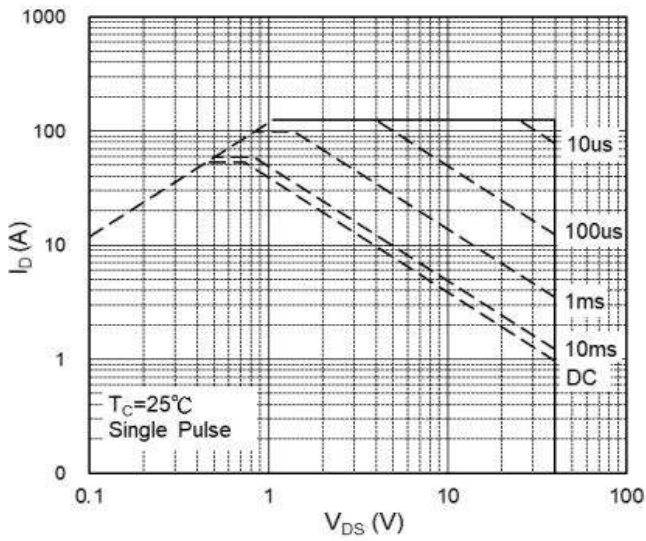
Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0 V, I_D = 250 \mu A$	BV_{DSS}	40	-	-	V
Drain-Source Leakage Current	$V_{DS} = 40V, V_{GS} = 0 V$	I_{DSS}	-	-	1	uA
Gate Leakage Current	$V_{GS} = \pm 20 V, V_{DS} = 0 V$	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	V_{GS(th)}	1	-	2.5	V
Drain-Source On-State Resistance	$V_{GS} = 10 V, I_D = 20 A$	TO-252	-	7.0	8.5	mΩ
		TO-263	-	7.3	8.5	
		TO-220AB	-	7.5	8.5	
Forward Transconductance	$V_{DS} = 5 V, I_D = 30 A$	g_{fs}	-	36	-	S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 15 V, f = 1 MHz$	C_{iss}	-	690	-	pF
Output Capacitance		C_{oss}	-	182	-	
Reverse Transfer Capacitance		C_{rss}	-	41	-	
Turn-on Delay Time(Note2)	$I_D = 15 A, V_{DD} = 20 V, R_G = 3.3 \Omega, V_{GS} = 10 V$	t_{d(ON)}	-	14	-	nS
Rise Time(Note2)		tr	-	5.5	-	
Turn-Off Delay Time(Note2)		t_{d(OFF)}	-	19	-	
Fall Time(Note2)		tf	-	10.2	-	
Total Gate Charge(Note2)	$I_D = 15 A, V_{DS} = 20 V, V_{GS} = 4.5 V$	Q_G	-	6.2	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	3.3	-	
Gate to Drain Charge(Note2)		Q_{GD}	-	1.5	-	

Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	60	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	125	A
Drain-Source Diode Forward Voltage	$V_{GS} = 0 V, I_S = 1 A, T_J = 25^\circ C$	V_{SD}	-	0.75	-	V

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

Ratings and Characteristic Curves



Package Outline Dimensions Millimeters

TO-220AB

	Dim.	Min.	Max.
	A	10.15	10.35
	B	2.65	2.95
	C	3.70	3.90
	D	28.5	29.5
	E	1.30	1.45
	F	6.35	6.55
	G	2.9	3.3
	H	15.0	16.0
	I	0.38	0.42
	J	4.45	4.55
	K	1.25	1.35
	L	Typ 5.08	
	M	Typ 2.54	
N	3.1	3.3	
O	0.76	0.84	
All Dimensions in millimeter			

TO-263

	Dim.	Min.	Max.
	A	10.1	10.2
	B	7.4	7.6
	C	1.3	1.5
	D	0.55	0.75
	E	5.0	6.0
	F	1.4	1.6
	G	0.78	0.86
	H	1.2	1.3
	I	Typ 2.54	
	J	8.4	8.6
	K	4.45	4.55
	L	1.25	1.35
	M	0.02	0.1
N	2.4	2.8	
O	0.36	0.40	
All Dimensions in millimeter			

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				