

**100V N-CHANNEL ENHANCEMENT MODE MOSFET**
**MAIN CHARACTERISTICS**

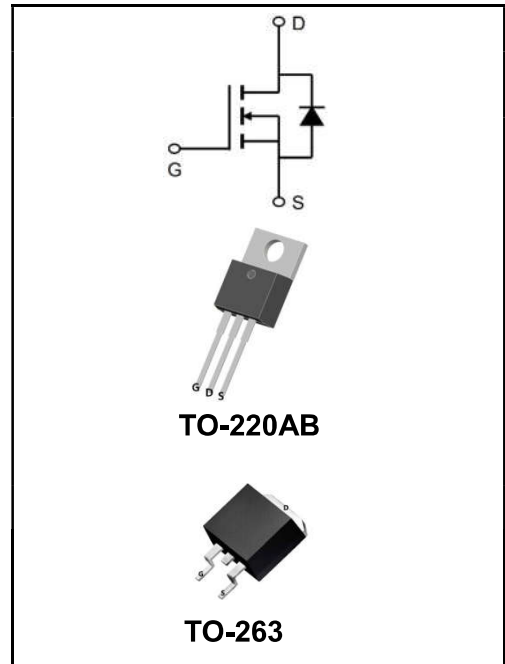
<b>I<sub>D</sub></b>	140A
<b>V<sub>DSS</sub></b>	100V
<b>R<sub>DS(ON)-typ(@V<sub>GS</sub>=10V)</sub></b>	< 4.2mΩ ( <b>Type:3.5mΩ</b> )

**Features**

- ◆ Ultra-low RDS(ON)
- ◆ Low Gate Charge
- ◆ High Current Capability
- ◆ 100% UIS Tested, 100% Rg Tested

**Application**

- ◆ Power Management in Telecom., Industrial Automation, CE
- ◆ Motor Driving in Power Tool, E-vehicle, Robotics
- ◆ Current Switching in DC/DC & AC/DC (SR) Sub-systems


**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW100N035AT	TO-220AB	YFW 100N035AT XXXXX	1000PCS/box
YFW100N035AS	TO-263	YFW 100N035AS XXXXX	800PCS/Reel

**Maximum Ratings at T<sub>c</sub>=25°C unless otherwise specified**

Characteristics	Symbols	Value	Units
Drain-Source Voltage	<b>V<sub>DS</sub></b>	100	<b>V</b>
Gate - Source Voltage	<b>V<sub>GS</sub></b>	±20	<b>V</b>
Continuous Drain Current, (@Note1)	<b>I<sub>D</sub></b>	140	<b>A</b>
Continuous Drain Current, @T <sub>c</sub> =100°C (@Note1)	<b>I<sub>D</sub></b>	88	<b>A</b>
Pulsed Drain Current (@Note2)	<b>I<sub>DM</sub></b>	426	<b>A</b>
Single Pulse Avalanche Energy (@Note3)	<b>E<sub>AS</sub></b>	151	<b>mJ</b>
Avalanche Current (@Note2)	<b>I<sub>AS</sub></b>	55	<b>A</b>
Total Power Dissipation <sup>4</sup> @T <sub>c</sub> =25°C (@Note4)	<b>P<sub>D</sub></b>	156	<b>W</b>
Total Power Dissipation <sup>4</sup> @T <sub>c</sub> =100°C (@Note4)		63	
Storage Temperature Range	<b>T<sub>STG</sub></b>	-55 to +150	<b>°C</b>
Operating Junction Temperature Range	<b>T<sub>J</sub></b>	-55 to +150	<b>°C</b>
Thermal Resistance, Junction-ambient	<b>R<sub>θJA</sub></b>	45	<b>°C/W</b>
Thermal Resistance, Junction-case	<b>R<sub>θJC</sub></b>	0.65	<b>°C/W</b>

**Maximum Ratings at Tc=25°C unless otherwise specified**

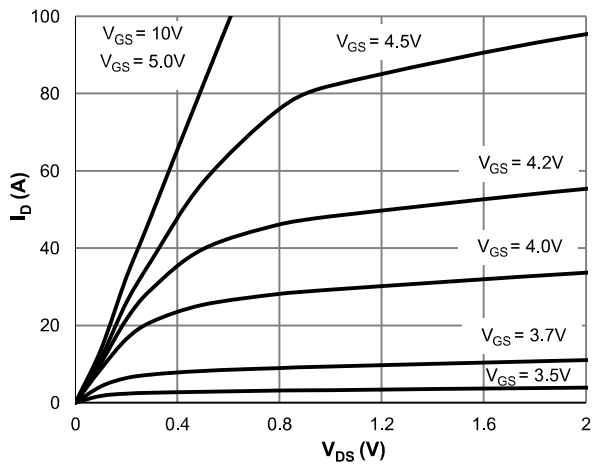
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$BV_{DSS}$	100	110	-	V
Gate -Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	$I_{GSS}$	-	-	$\pm 100$	nA
Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$	$I_{DSS}$	-	-	1	$\mu A$
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2.0	2.7	4.0	V
Drain-Source on-Resistance	$V_{GS}=10V, I_D=20A$	TO-220	-	3.5	4.2	m $\Omega$
		TO-263	-	3.5	4.2	
Forward Transconductance	$V_{DS}=5V, I_D=20A$	$G_{FS}$	-	106	-	S
Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	$C_{iss}$	-	3433	-	pF
Output Capacitance		$C_{oss}$	-	905	-	
Reverse Transfer Capacitance		$C_{rss}$	-	13	-	
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	$R_g$	-	2.1	-	$\Omega$
Turn-on delay time	$V_{GS}=10V, V_{DS}=50V, R_G=6\Omega, R_L=2.5\Omega$	$t_{d(on)}$	-	14.1	-	nS
Rise Time		$T_r$	-	34	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	60	-	
Fall Time		$t_f$	-	50	-	
Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=20A$	$Q_g$	-	57	-	nC
Gate-Source Charge		$Q_{gs}$	-	11	-	
Gate-Drain Charge		$Q_{gd}$	-	16.1	-	
Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_F=1A$	$V_{SD}$	-	0.7	1.0	V
Continuous Source Current <sup>1,5</sup>	TC = 25°C	$I_S$	-	-	156	A
Body Diode Reverse Recovery Time	$I_F=20A, di_{SD}/dt=100A/\mu s, T_J=25^\circ C,$	$t_{rr}$	-	78	-	nS
Body Diode Reverse Recovery Charge		$Q_{rr}$	-	180	-	nC

**Notes:**

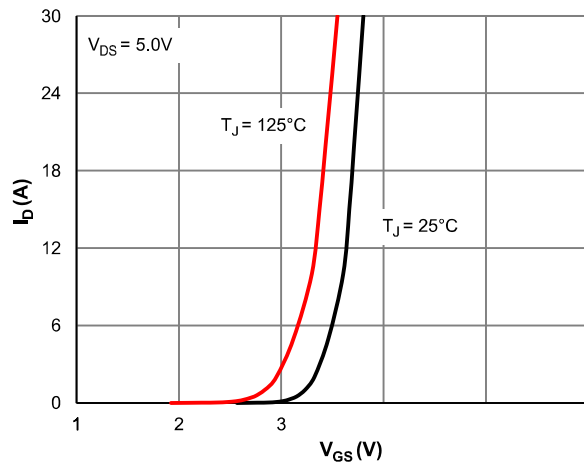
1. Computed continuous current assumes the condition of T<sub>J</sub>\_Max while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T<sub>J</sub>\_Max = 150°C.
3. This single-pulse measurement was taken under the following condition [L = 100 $\mu$ H, V<sub>GS</sub> = 10V, V<sub>DS</sub> = 50V] while its value is limited by T<sub>J</sub>\_Max = 150°C.
4. The power dissipation PD is based on T<sub>J</sub>\_Max = 150°C.
5. This value is guaranteed by design hence it is not included in the production tes

**Ratings and Characteristic Curves**

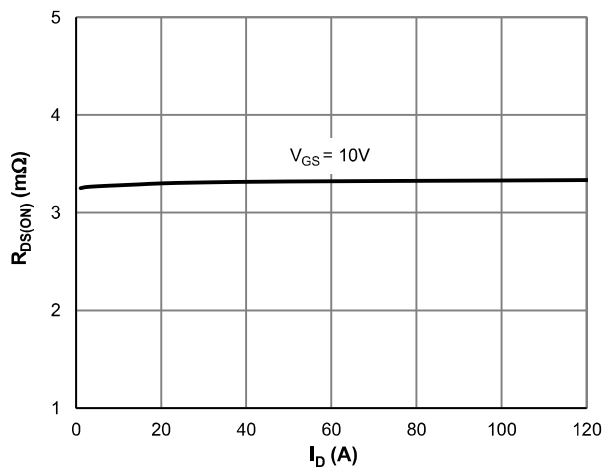
**Typical Electrical & Thermal Characteristics**



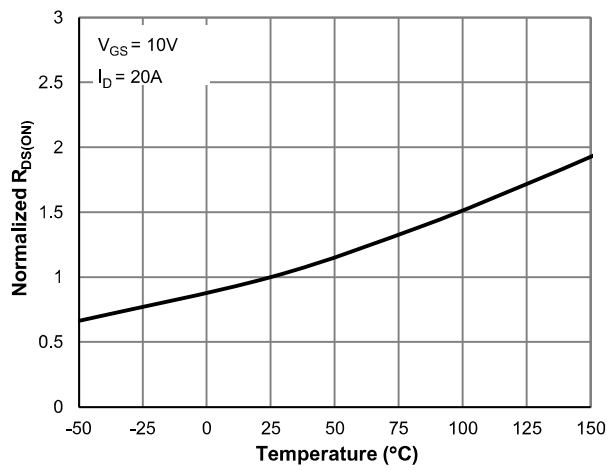
**Figure 1: Saturation Characteristics**



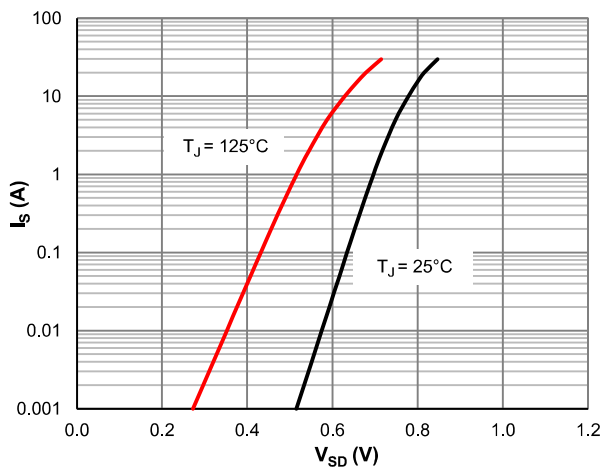
**Figure 2: Transfer Characteristics**



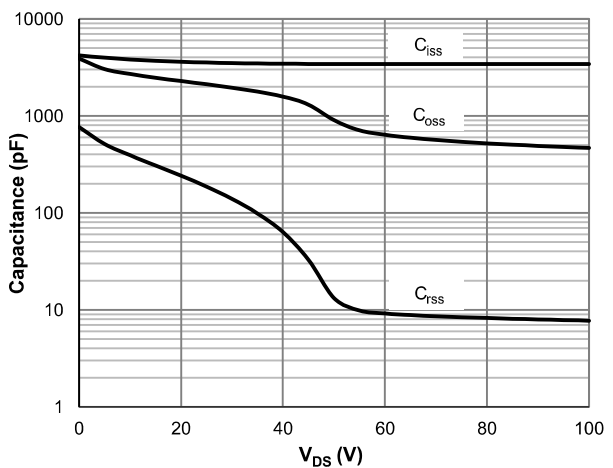
**Figure 3:  $R_{DS(ON)}$  vs. Drain Current**



**Figure 4:  $R_{DS(ON)}$  vs. Junction Temperature**



**Figure 5: Body-Diode Characteristics**



**Figure 6: Capacitance Characteristics**

Ratings and Characteristic Curves

Typical Electrical & Thermal Characteristics

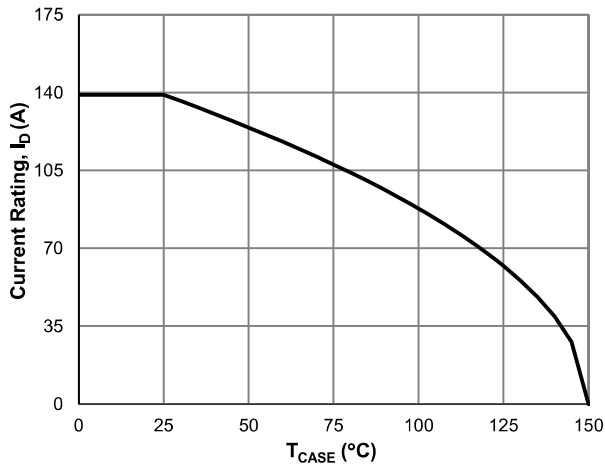


Figure 7: Current De-rating

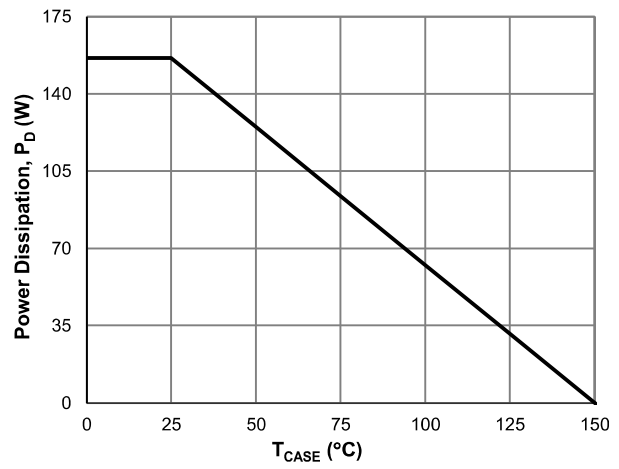


Figure 8: Power De-rating

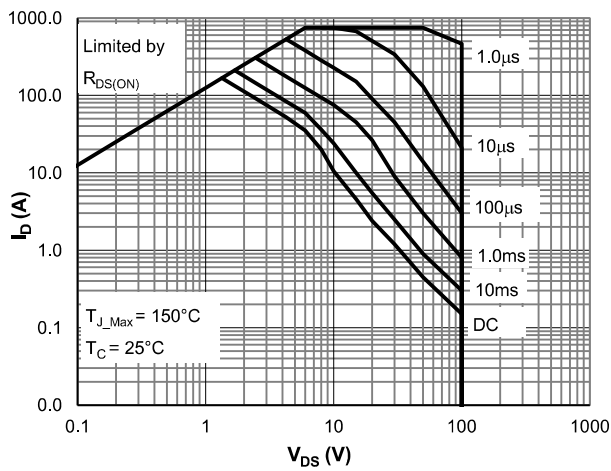


Figure 9: Maximum Safe Operating Area

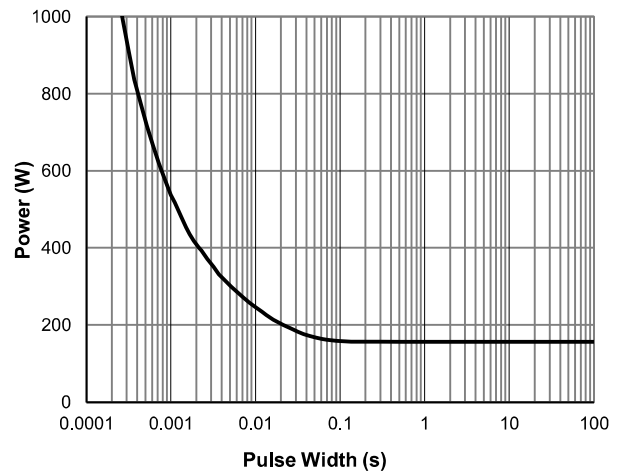


Figure 10: Single Pulse Power Rating, Junction-to-Case

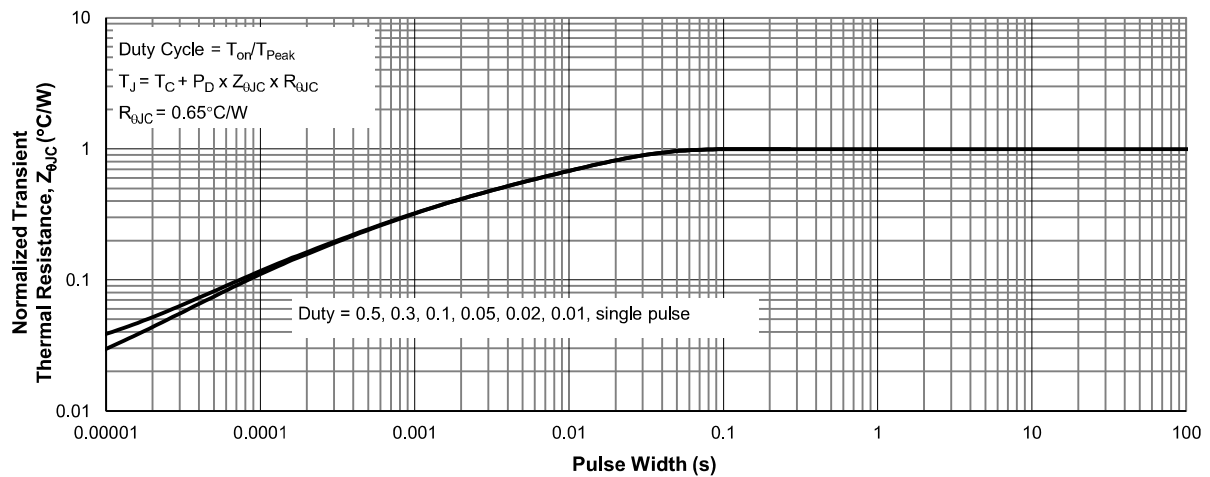


Figure 11: Normalized Maximum Transient Thermal Impedance

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			