

-100V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

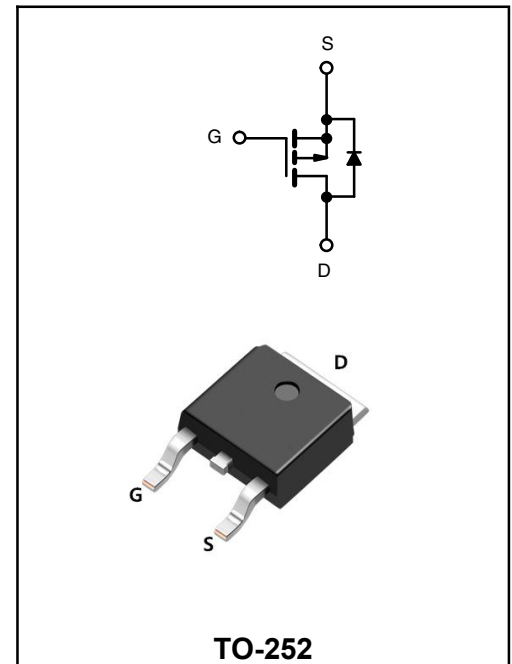
I_D	-40A
V_{DSS}	-100V
R_{DS(on)-typ}(@V_{GS}=-10V)	<0.033Ω
R_{DS(on)-typ}(@V_{GS}=-4.5V)	<0.036Ω

FEATURES

- ◆Improved dv/dt capability
- ◆Fast switching
- ◆100% EAS Guaranteed
- ◆Green Device Available

APPLICATIONS

- ◆Networking
- ◆Load Switch
- ◆LED applications



Product Specification Classification

Part Number	Package	Marking	Pack
YFW40P100AD	TO-252	YFW 40P10AD XXXXX	2500PCS/Tape

Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics		Symbols	Value	Units
Drain-Source Voltage		V_{DS}	-100	V
Gate - Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	T _c =25°C	I_D	-40	A
Drain Current – Continuous	T _c =125°C	I_D	-22	A
Drain Current – Pulsed		I_{DM}	-150	A
Single Pulse Avalanche Current	L=0.1mH	I_{AS}	-44	A
Single Pulse Avalanche Energy	L=0.1mH	E_{AS}	96	mJ
Maximum Power Dissipation ^b	T _c =25°C	P_D	136	W
	T _c =125°C	P_D	45	W
Operating Junction Temperature Range		T_J	-55 to +150	°C
Storage Temperature Range		T_{STG}	-55 to +150	°C
Thermal Resistance Junction to Case		R_{θJC}	1.1	°C/W
Thermal Resistance, Junction to Ambient		R_{θJA}	50	°C/W

Notes

- Package limited.
- Pulse test; pulse width ≤ 300 us, duty cycle ≤ 2 %.
- When mounted on 1"square PCB (FR-4 material).
- Parametric verification ongoing.

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	-	-	V
Drain-Source Leakage Current	$V_{DS} = -100V, V_{GS} = 0V$	I_{DSS}	-	-	-1	μA
	$V_{DS}=-100V, V_{GS}=0V, T_J=125^\circ C$		-	-	-50	
	$V_{DS}=-100V, V_{GS}=0V, T_J=175^\circ C$				-250	
Gate -Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.0	-	-2.5	V
On-State Drain Current ^a	$V_{DS}=-10V, V_{GS} \leq -5V$	$I_{D(ON)}$	-30	-	-	A
Forward Transconductance ^b	$V_{DS}=-10V, I_D=-9.2A$	g_{fs}	-	35	-	S
Drain-Source On-State Resistance ^a	$V_{GS}=-10V, I_D=-9.2A$	$R_{DS(ON)}$	-	0.033	-	Ω
	$V_{GS}=-10V, I_D=-9.2A, T_J=125^\circ C$		-	0.065	-	
	$V_{GS}=-10V, I_D=-7.7A, T_J=175^\circ C$			0.081		
	$V_{GS}=-4.5V, I_D=-7.7A$		-	0.037		
Input Capacitance	$V_{DS}=-25V$ $V_{GS}=0V$ $F=1MHz$	C_{iss}	-	4433	-	pF
Output Capacitance		C_{oss}	-	301	-	
Reverse Transfer Capacitance		C_{rss}	-	208	-	
Turn-on Delay Time ^c	$V_{DD}=-50V$ $R_L=6.49\Omega$ $I_D=-7.7A$ $V_{GEN}=-10V$ $R_g=1.0\Omega$	$t_{d(on)}$	-	11	17	ns
Rise Time ^c		T_r	-	11	17	
Turn-Off Delay Time ^c		$t_{d(OFF)}$	-	78	117	
Fall Time ^c		t_f	-	15	23	
Total Gate Charge ^c	$V_{DS}=-50V$ $V_{GS}=-10V$ $I_D=-9.2A$	Q_g	-	96	144	nC
Gate-Source Charge ^c		Q_{gs}	-	8.4	-	
Gate-Drain Charge ^c		Q_{gd}	-	23.5	-	
Gate Resistance	$f=1MHz$	R_g	1.5	3.13	4.7	Ω
Continuous Source Current	$V_G=V_D=0V$ Force Current	I_s	-	-	-50	A
Pulsed Source Current		I_{SM}	-	-	-150	A
Diode Forward Voltage	$V_{GS}=0V, I_F=7.7A$	V_{SD}	-	-0.8	-1.5	V

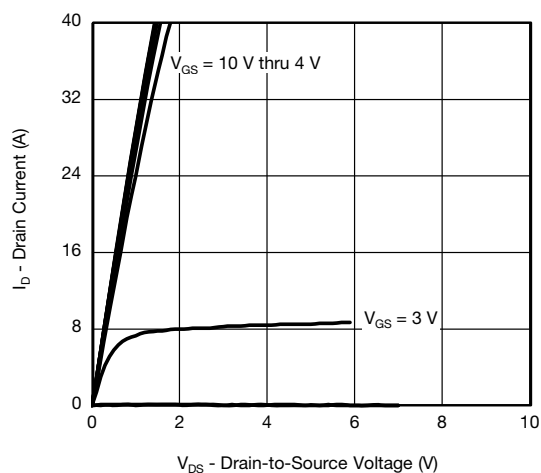
Notes

a. Pulsetest; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

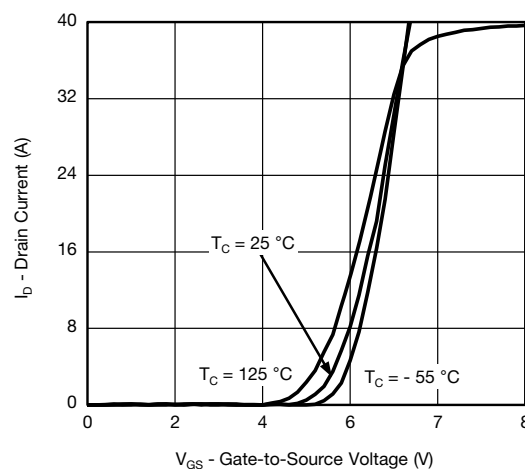
b. Guaranteed by design, not subject to production testing.

c. Independent of operating temperature.

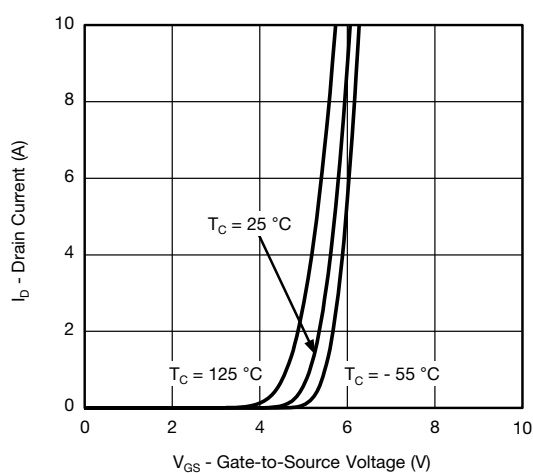
Ratings and Characteristic Curves



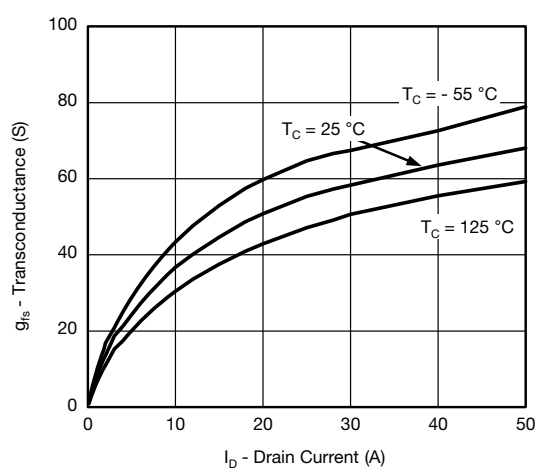
Output Characteristics



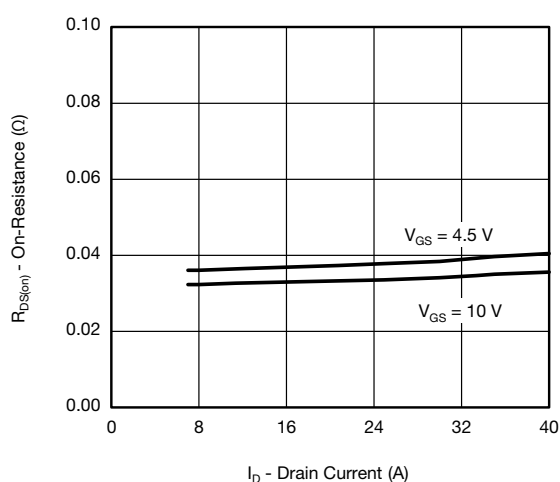
Transfer Characteristics



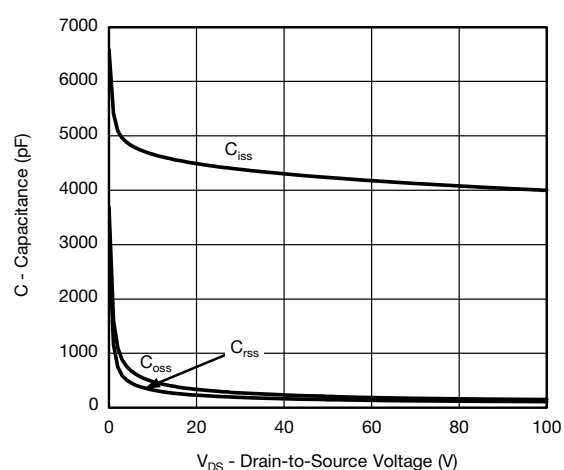
Transfer Characteristics



Transconductance

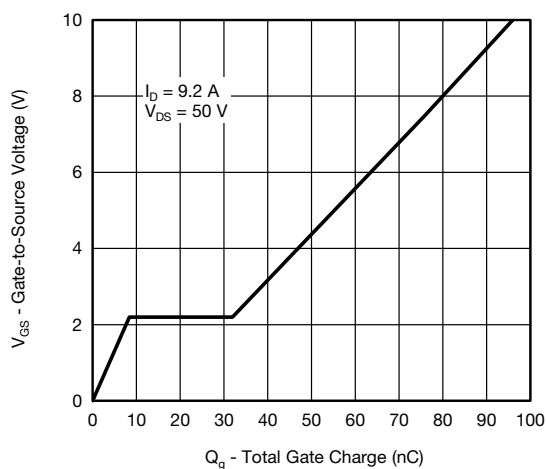


On-Resistance vs. Drain Current

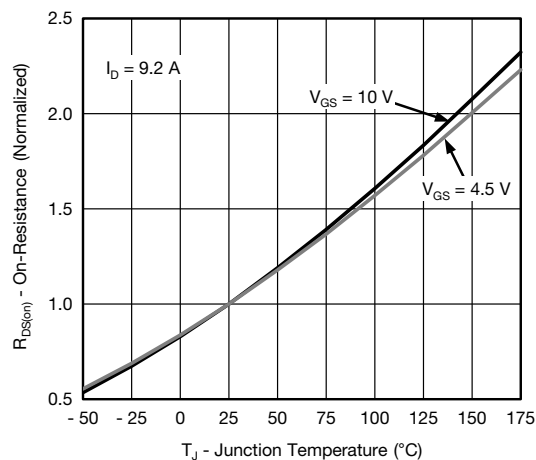


Capacitance

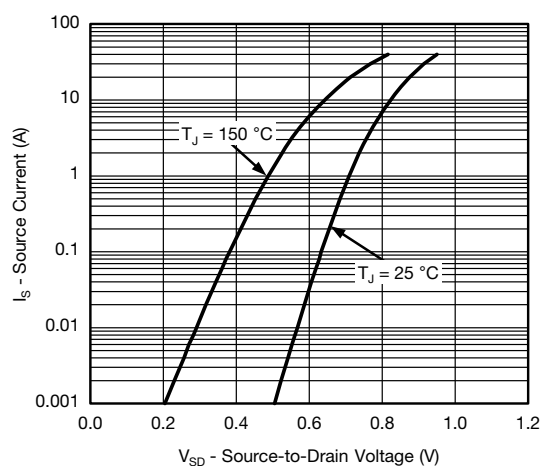
Ratings and Characteristic Curves



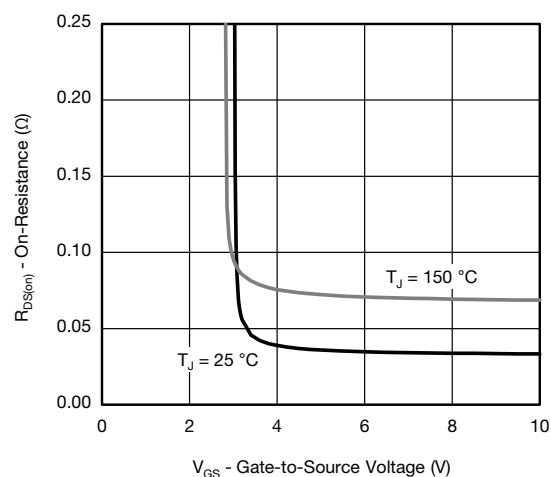
Gate Charge



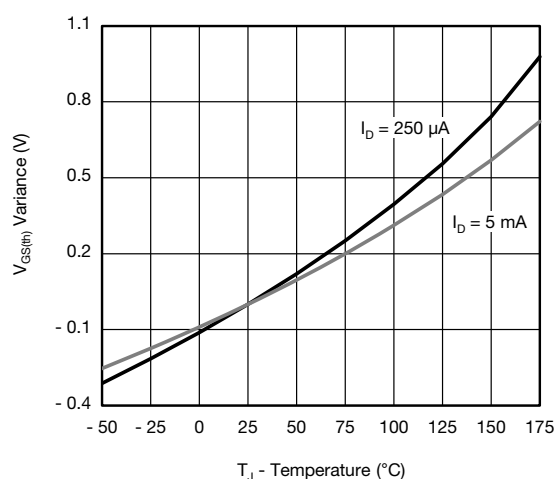
On-Resistance vs. Junction Temperature



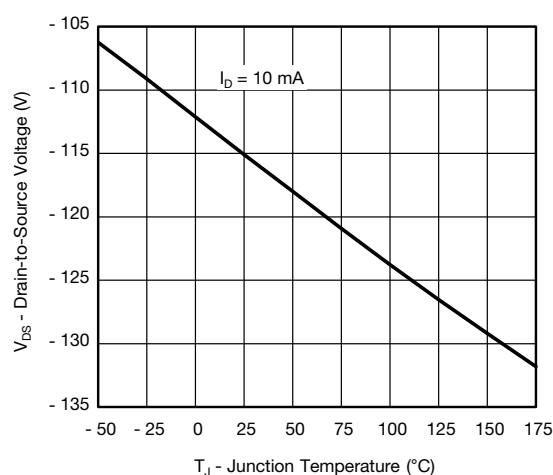
Source Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

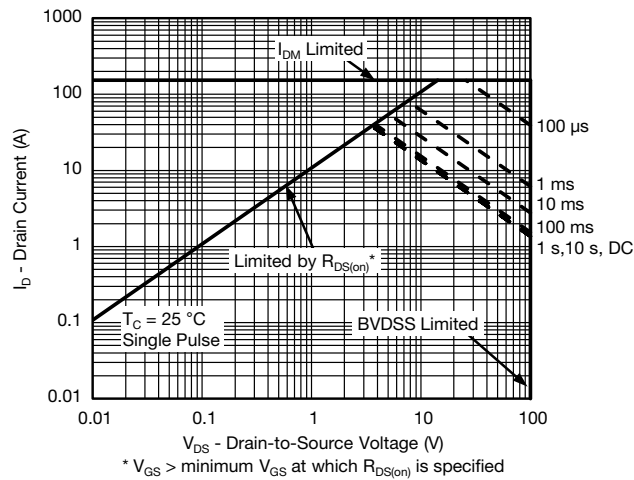


Threshold Voltage

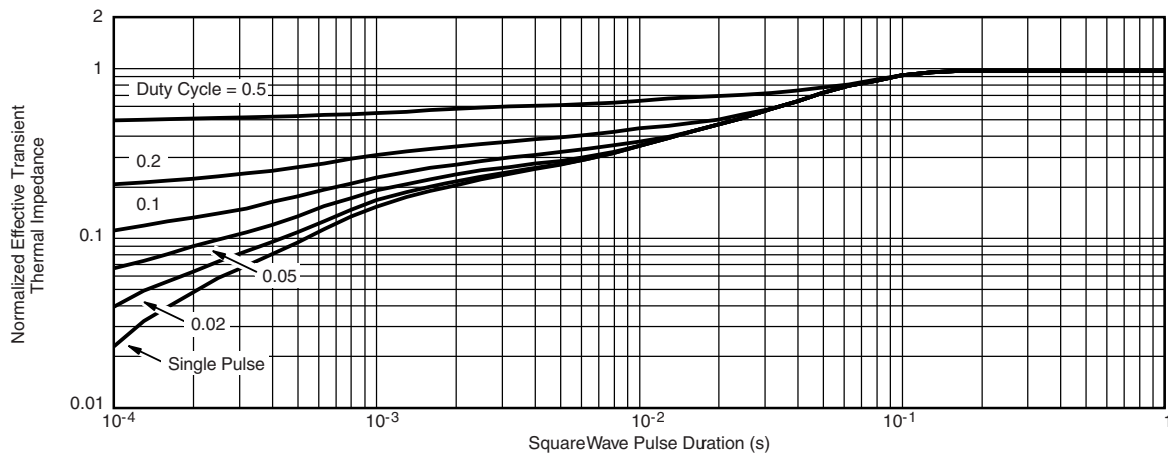


Drain Source Breakdown vs. Junction Temperature

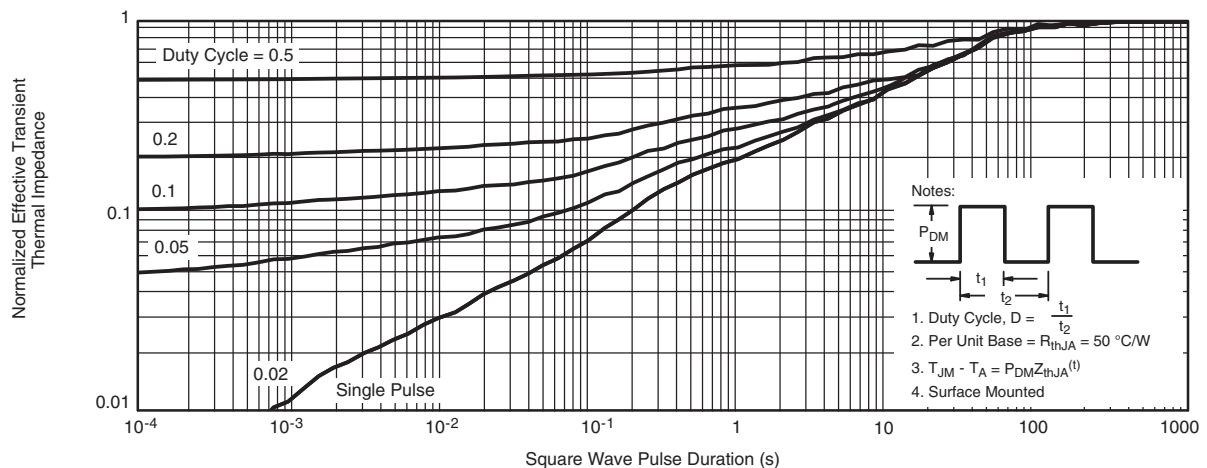
Ratings and Characteristic Curves



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case



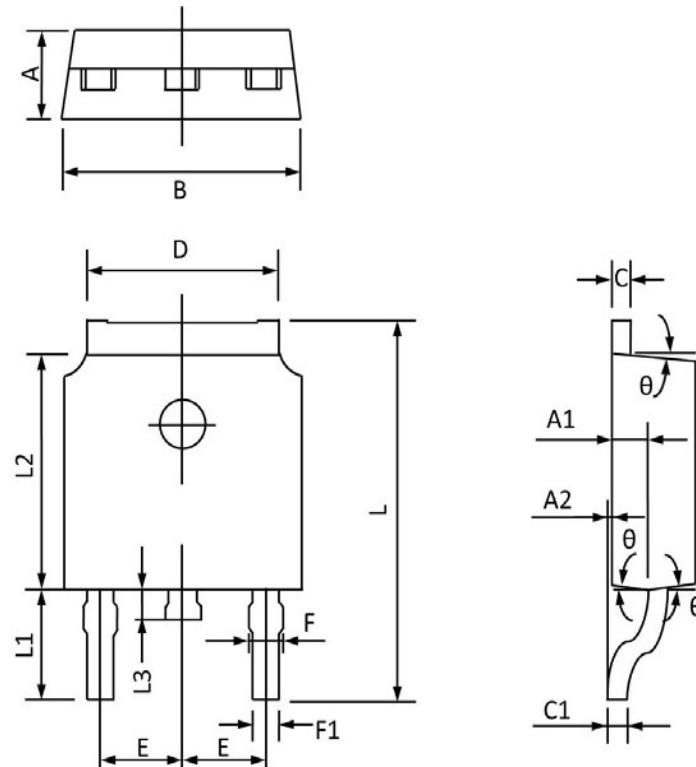
Normalized Thermal Transient Impedance, Junction-to-Ambient

Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction to Ambient (25 °C)
 - Normalized Transient Thermal Impedance Junction to Case (25 °C)
- are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

Package Outline Dimensions Millimeters

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.400	0.268	0.252
C	0.580	0.450	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.500	5.100	0.217	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.400	0.244	0.213
L3	1.200	0.600	0.047	0.024