

**ZVP1320F**

**200V P-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET IN SOT23**

**Features and Benefits**

- $V_{(BR)DSS} > -200V$
- $R_{DS(on)} \leq 80\Omega @ V_{GS} = -10V$
- Maximum continuous drain current  $I_D = -35mA$
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

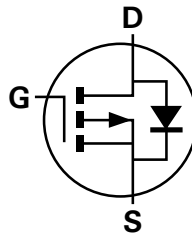
**Mechanical Data**

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.001 grams (approximate)

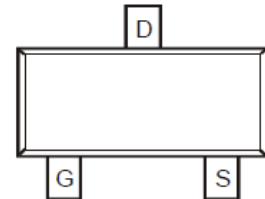
SOT23



Top View



Device symbol



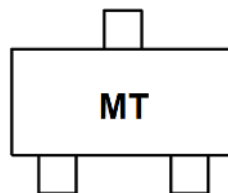
Pin-Out  
Top View

**Ordering Information** (Note 3)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZVP1320FTA	MT	7	8	3000

- Notes:
1. No purposefully added lead
  2. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

**Marking Information**



MT = Product Type Marking Code

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

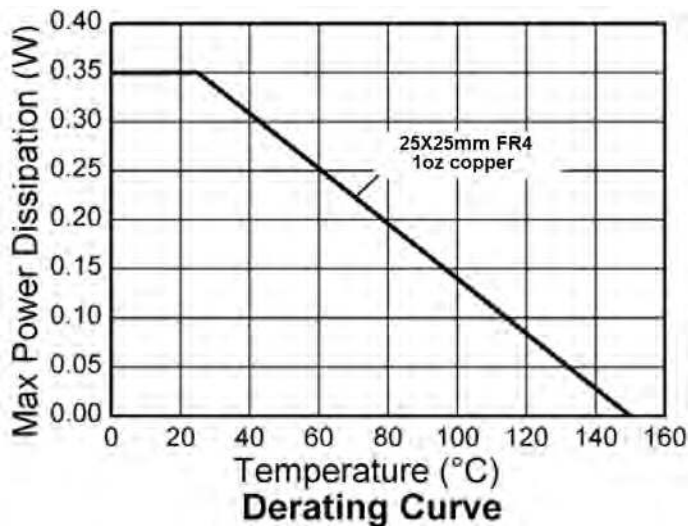
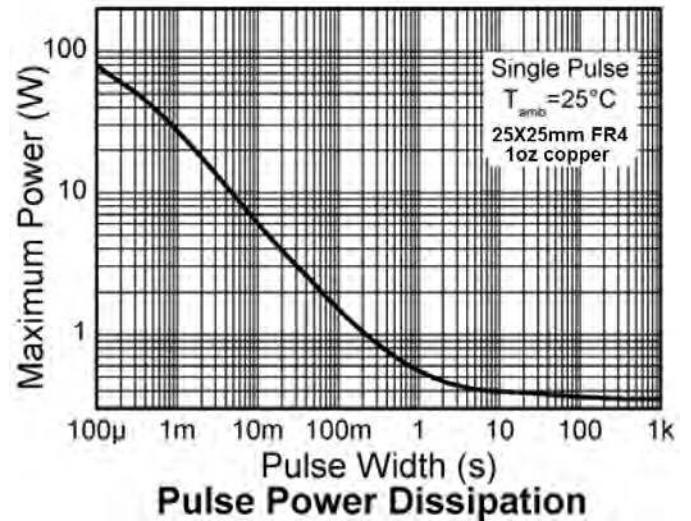
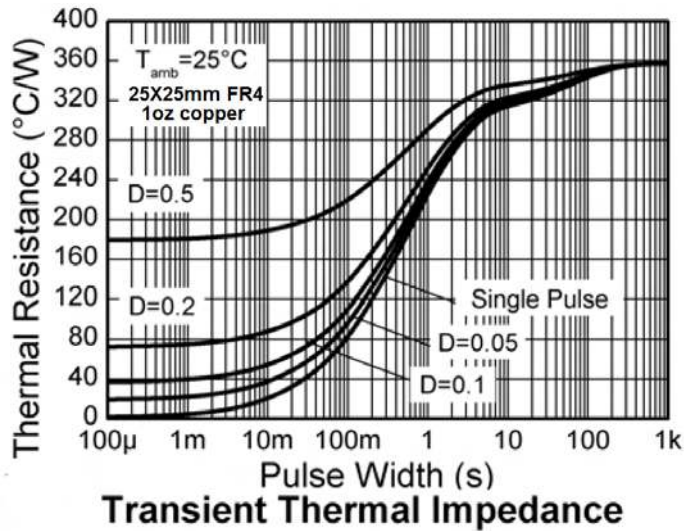
Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-200	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	-35	mA
Pulsed Drain Current (Note 5)	$I_{DM}$	-400	mA

**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	$P_D$	350	mW
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
4. For a device mounted on 25mm X 25mm X 1.6mm FR-4 PCV with high coverage of single sided 1oz copper, in still air condition.
  5. Device mounted on minimum recommended pad layout test board, 10 $\mu\text{s}$  pulse duty cycle = 1%.

**Thermal Characteristics**

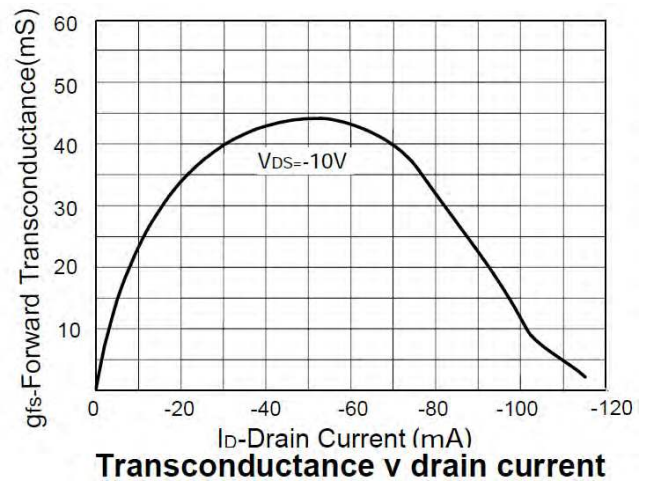
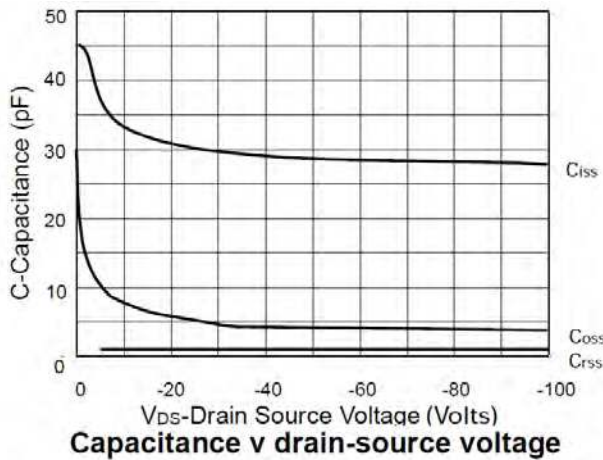
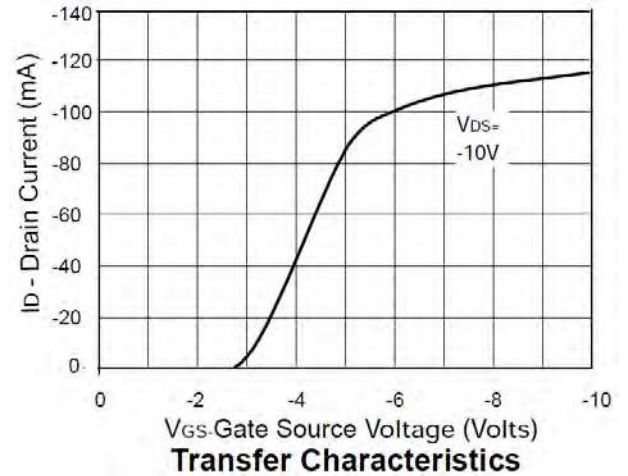
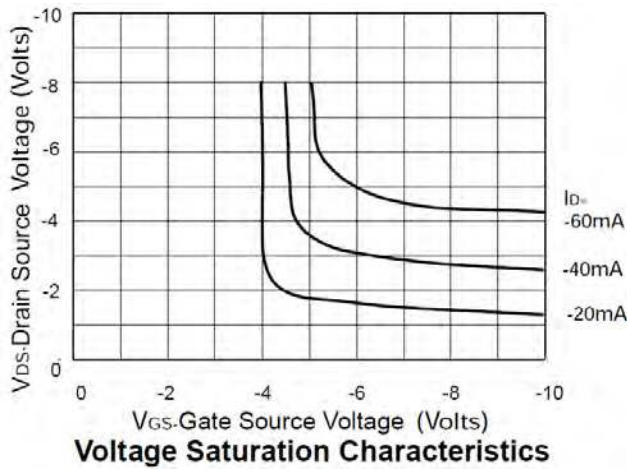
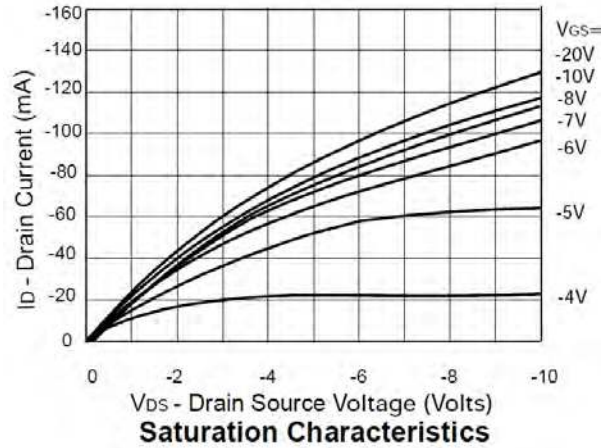
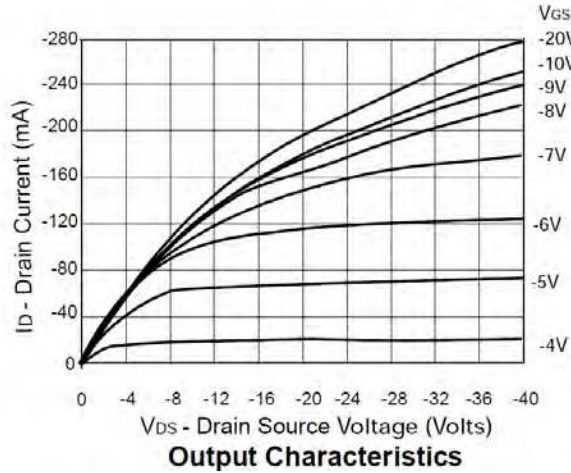


**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

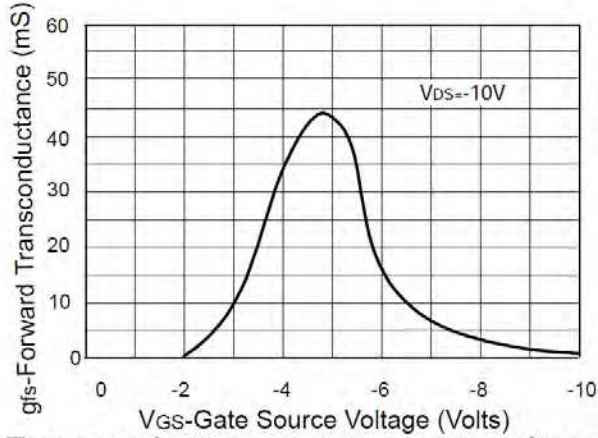
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-200	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -1mA
Zero Gate Voltage Drain Current T <sub>J</sub> = 25°C	I <sub>DSS</sub>	-	-	-1 -20	μA	V <sub>DS</sub> = -200V, V <sub>GS</sub> = 0V V <sub>DS</sub> = -160V, V <sub>GS</sub> = 0V, T <sub>A</sub> = 125°C
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±20	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
On-State Drain Current	I <sub>D(on)</sub>	-100	-	-	mA	V <sub>GS</sub> = -10V, V <sub>DS</sub> = -15V
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1.5	-	-3.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -1mA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	-	-	80	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -50mA
Forward Transconductance	g <sub>fs</sub>	25	-	-	mS	V <sub>DS</sub> = -15V, I <sub>D</sub> = -50mA
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	C <sub>iSS</sub>	-	-	50	pF	V <sub>DS</sub> = -25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	-	15	pF	
Reverse Transfer Capacitance	C <sub>rSS</sub>	-	-	5	pF	
Turn-On Delay Time	t <sub>D(on)</sub>	-	-	8	ns	V <sub>DS</sub> = -25V, I <sub>D</sub> = -50mA
Turn-On Rise Time	t <sub>r</sub>	-	-	8	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	-	8	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	-	16	ns	

Notes: 6. Short duration pulse test used to minimize self-heating effect.

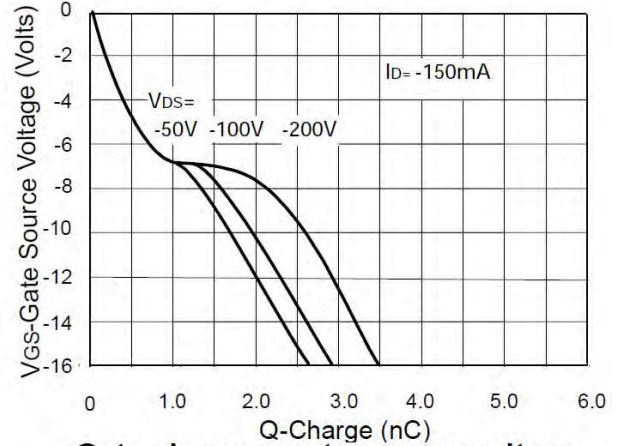
**Electrical Characteristics**



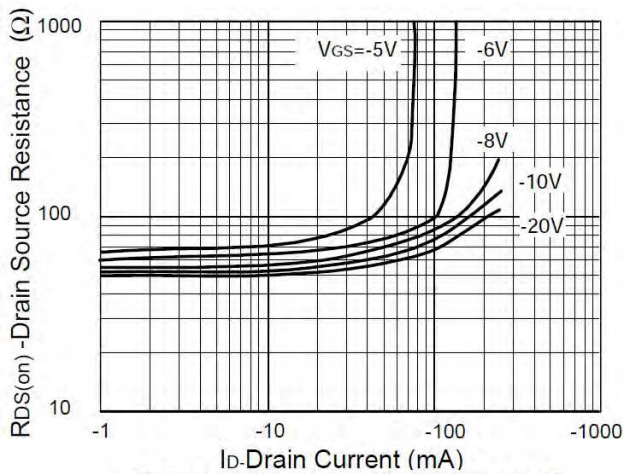
**Electrical Characteristics (cont.)**



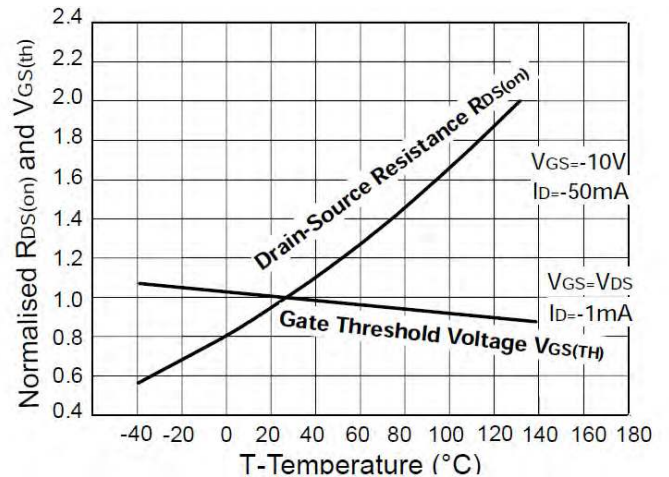
**Transconductance v gate-source voltage**



**Gate charge v gate-source voltage**

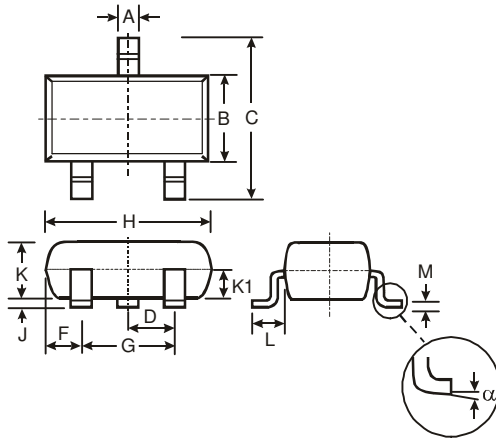


**On-resistance v drain current**



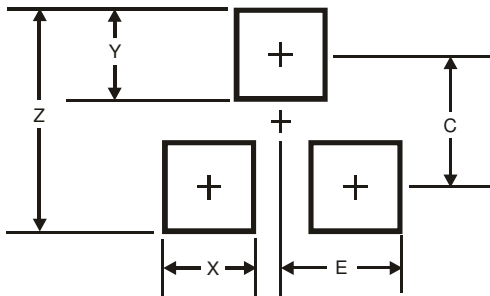
**Normalised RDS(on) and VGS(th) vs Temperature**

**Package Outline Dimensions**



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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