ZVP1320F

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

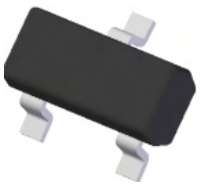
Features and Benefits

- $V_{(BR)DSS}$ > -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**

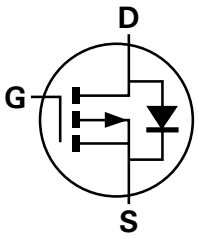
Mechanical Data

- 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)

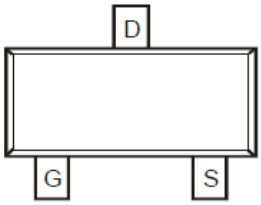
SOT23



Top View



Device symbol



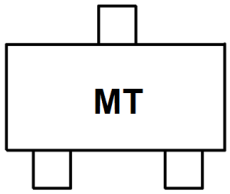
Pin-Out
Top View

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°C unless otherwise specified

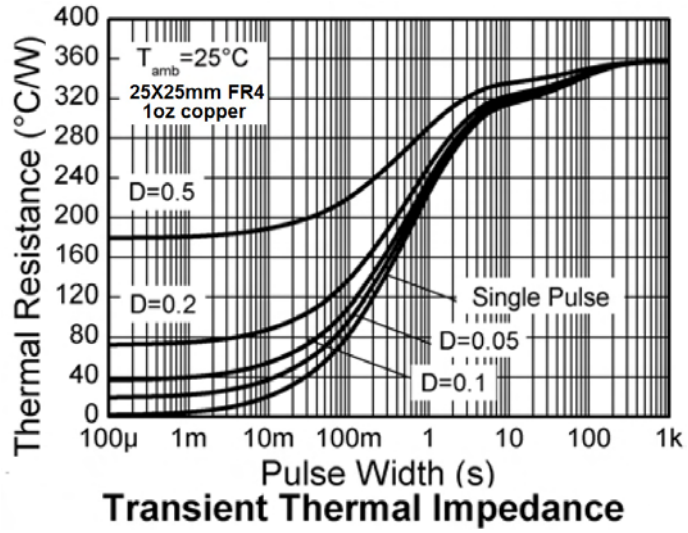
Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-200	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	-35	mA
Pulsed Drain Current (Note 5)	I_{DM}	-400	mA

Thermal Characteristics @T_A = 25°C unless otherwise specified

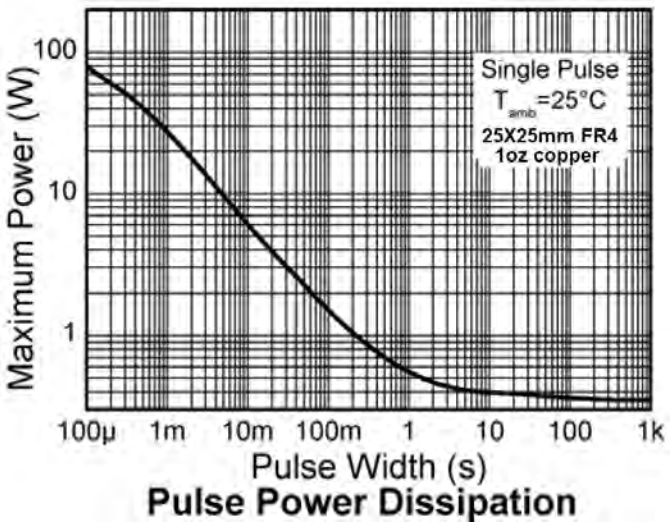
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 4)	P_D	350	mW
Thermal Resistance, Junction to Ambient	(Note 4)	$R_{\theta JA}$	357	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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, 10μs pulse duty cycle = 1%.

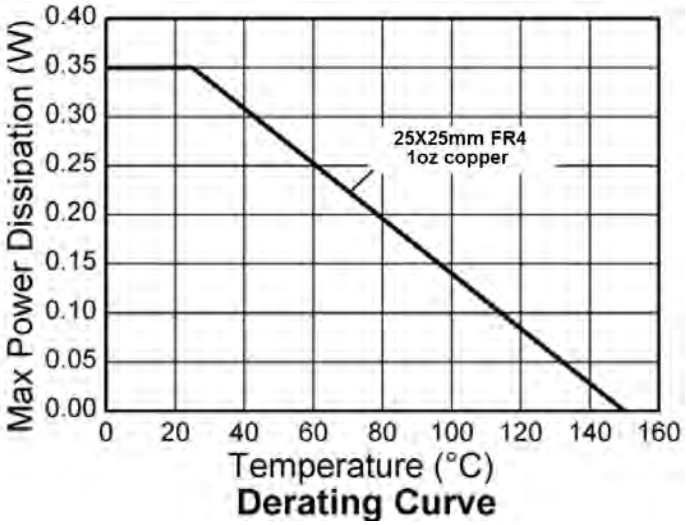
Thermal Characteristics



Transient Thermal Impedance



Pulse Power Dissipation



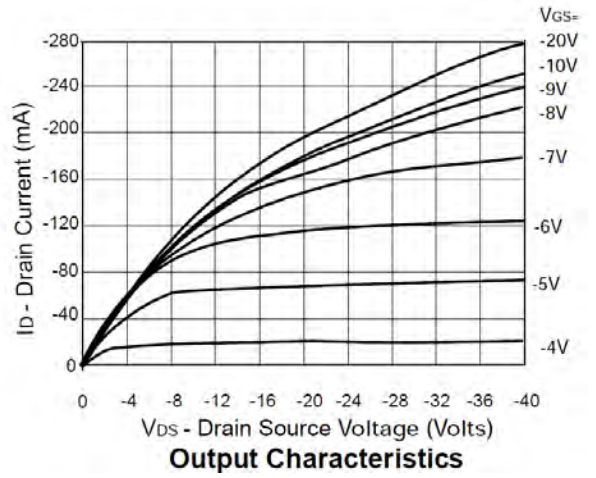
Derating Curve

Electrical Characteristics @T_A = 25°C unless otherwise specified

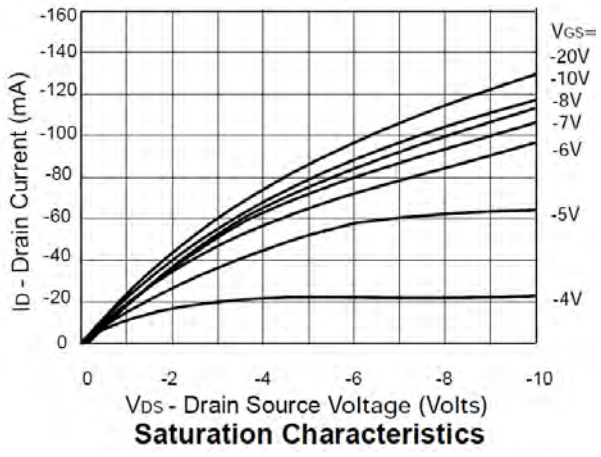
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	-200	-	-	V	V_{GS} = 0V, I_D = -1mA
Zero Gate Voltage Drain Current T_J = 25°C	I_{DSS}	-	-	-1 -20	µA	V_{DS} = -200V, V_{GS} = 0V V_{DS} = -160V, V_{GS} = 0V, T_A = 125°C
Gate-Source Leakage	I_{GSS}	-	-	±20	nA	V_{GS} = ±20V, V_{DS} = 0V
On-State Drain Current	$I_{D(on)}$	-100	-	-	mA	V_{GS} = -10V, V_{DS} = -15V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	-1.5	-	-3.5	V	V_{DS} = V_{GS}, I_D = -1mA
Static Drain-Source On-Resistance	$R_{DS\ (on)}$	-	-	80	Ω	V_{GS} = -10V, I_D = -50mA
Forward Transconductance	g_{fs}	25	-	-	mS	V_{DS} = -15V, I_D = -50mA
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C_{iss}	-	-	50	pF	V_{DS} = -25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	-	15	pF	
Reverse Transfer Capacitance	C_{rss}	-	-	5	pF	
Turn-On Delay Time	$t_{D(on)}$	-	-	8	ns	V_{DS} = -25V, I_D = -50mA
Turn-On Rise Time	t_r	-	-	8	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	-	8	ns	
Turn-Off Fall Time	t_f	-	-	16	ns	

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

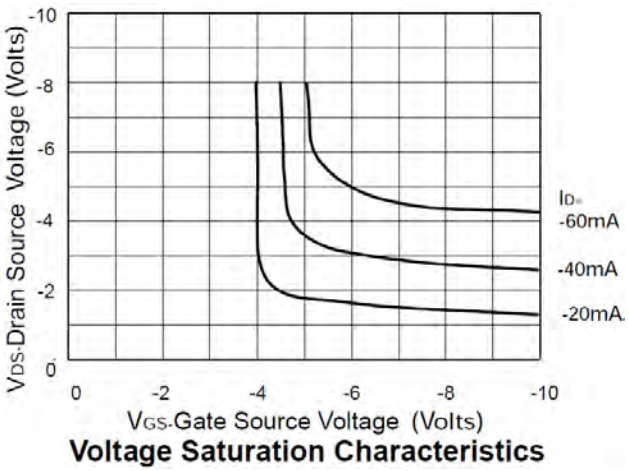
Electrical Characteristics



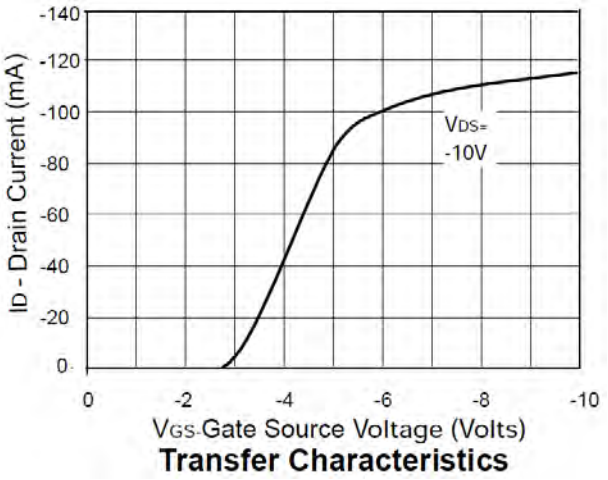
Output Characteristics



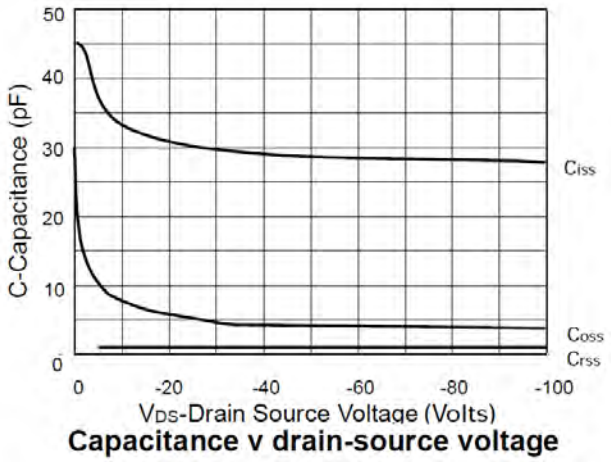
Saturation Characteristics



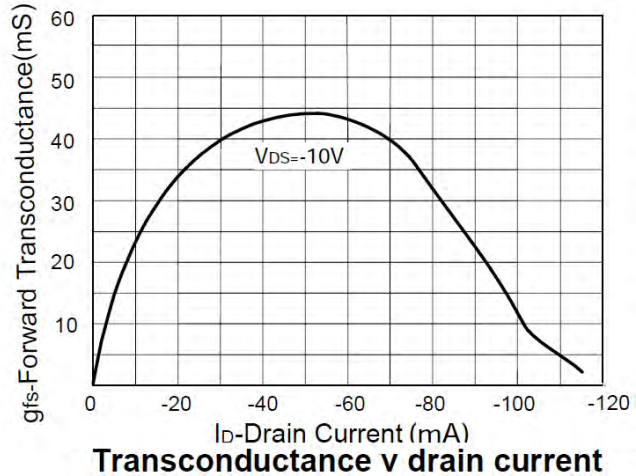
Voltage Saturation Characteristics



Transfer Characteristics

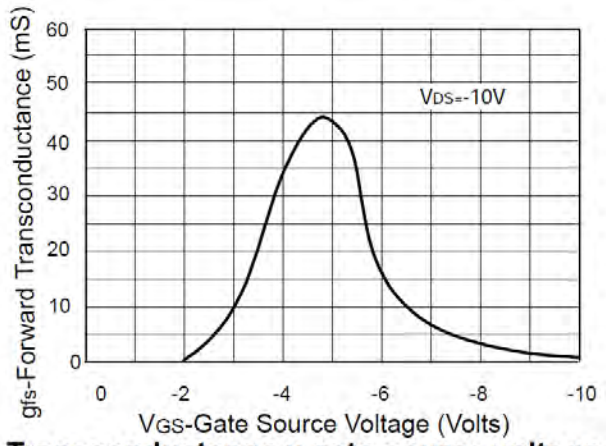


Capacitance v drain-source voltage

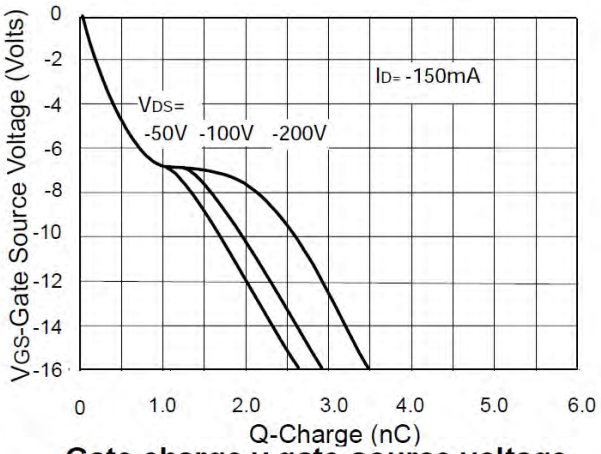


Transconductance v drain current

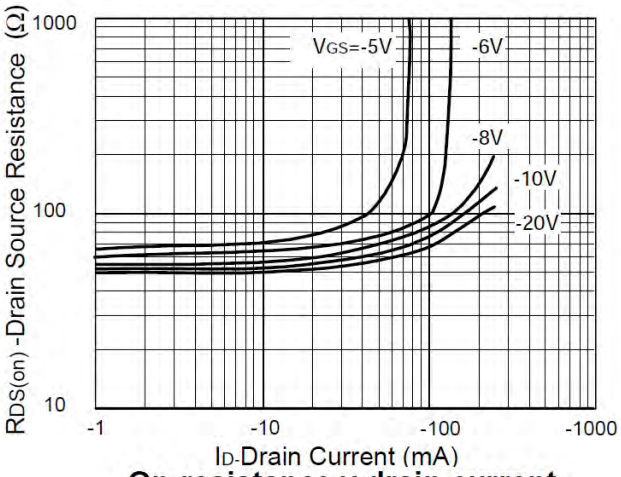
Electrical Characteristics (cont.)



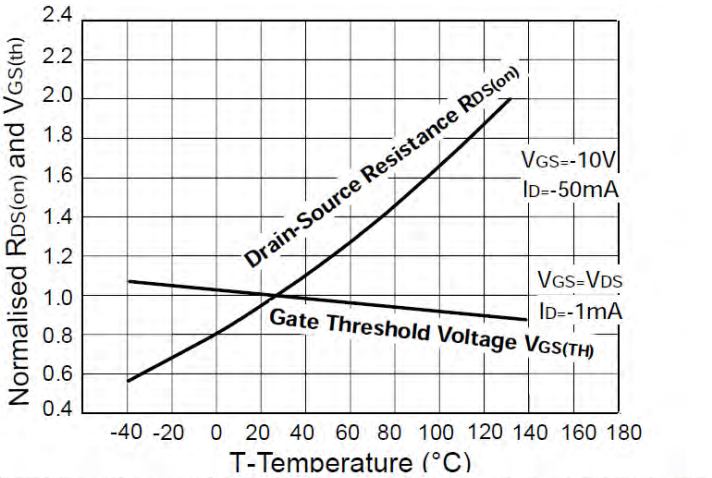
Transconductance v gate-source voltage



Gate charge v gate-source voltage

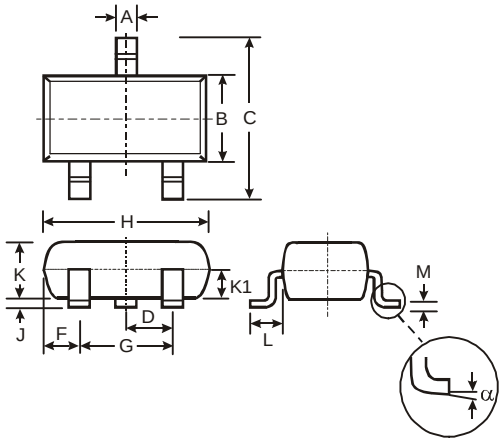


On-resistance v drain current



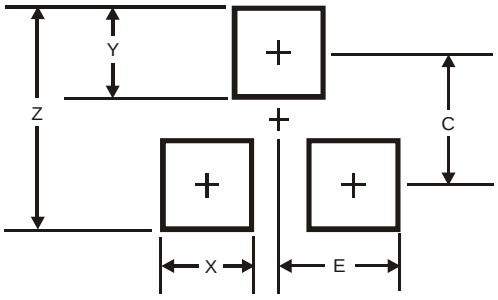
Normalised $R_{DS(on)}$ and $V_{GS(th)}$ vs Temperature

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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