

# SOT223 P-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

## ZVP2120G

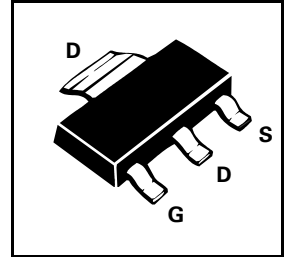
ISSUE 3 - OCTOBER 1995



### FEATURES

- \* 200 Volt  $V_{DS}$
- \*  $R_{DS(on)}=25\Omega$

PARTMARKING DETAIL – ZVP2120  
COMPLEMENTARY TYPE – ZVN2120G



### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Drain-Source Voltage	$V_{DS}$	-200	V
Continuous Drain Current at $T_{amb}=25^{\circ}\text{C}$	$I_D$	-200	mA
Pulsed Drain Current	$I_{DM}$	-1.2	A
Gate Source Voltage	$V_{GS}$	$\pm 20$	V
Power Dissipation at $T_{amb}=25^{\circ}\text{C}$	$P_{tot}$	2	W
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}\text{C}$

### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

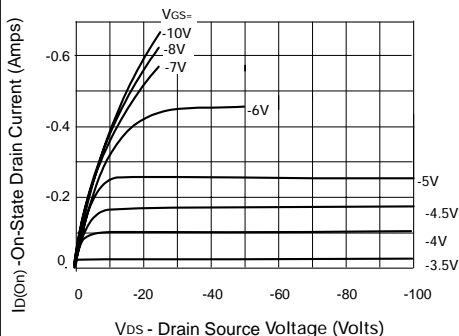
PARAMETER	SYMBOL	MIN.	MAX.	UNIT	CONDITIONS.
Drain-Source Breakdown Voltage	$BV_{DSS}$	-200		V	$I_D=-1\text{mA}$ , $V_{GS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	-1.5	-3.5	V	$I_D=-1\text{mA}$ , $V_{DS}=V_{GS}$
Gate-Body Leakage	$I_{GSS}$		-20	nA	$V_{GS}=\pm 20\text{V}$ , $V_{DS}=0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$		-10 -100	$\mu\text{A}$ $\mu\text{A}$	$V_{DS}=-200\text{V}$ , $V_{GS}=0$ $V_{DS}=-160\text{V}$ , $V_{GS}=0\text{V}$ , $T=125^{\circ}\text{C}$ (2)
On-State Drain Current(1)	$I_{D(on)}$	-300		mA	$V_{DS}=-25\text{V}$ , $V_{GS}=-10\text{V}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$		25	$\Omega$	$V_{GS}=-10\text{V}$ , $I_D=-150\text{mA}$
Forward Transconductance (1)(2)	$g_{fs}$	50		mS	$V_{DS}=-25\text{V}$ , $I_D=-150\text{mA}$
Input Capacitance (2)	$C_{iss}$		100	pF	$V_{DS}=-25\text{V}$ , $V_{GS}=0\text{V}$ , $f=1\text{MHz}$
Common Source Output Capacitance (2)	$C_{oss}$		25	pF	
Reverse Transfer Capacitance (2)	$C_{rss}$		7	pF	
Turn-On Delay Time (2)(3)	$t_{d(on)}$		7	ns	$V_{DD}\approx -25\text{V}$ , $I_D=-150\text{mA}$
Rise Time (2)(3)	$t_r$		15	ns	
Turn-Off Delay Time (2)(3)	$t_{d(off)}$		12	ns	
Fall Time (2)(3)	$t_f$		15	ns	

(1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$  (2) Sample test.

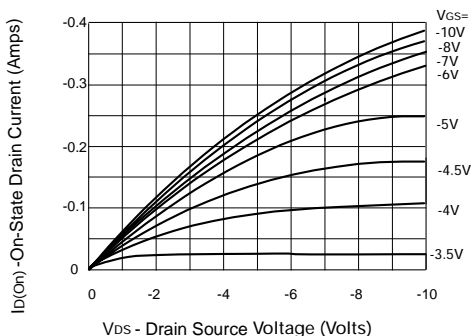
(3) Switching times measured with 50 $\Omega$  source impedance and <5ns rise time on a pulse generator

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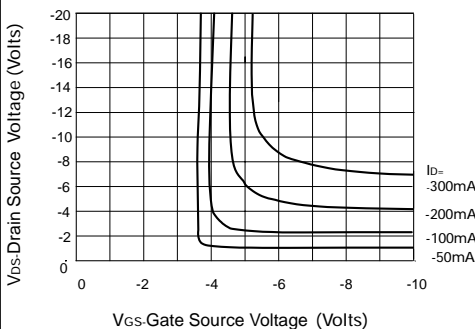
## TYPICAL CHARACTERISTICS



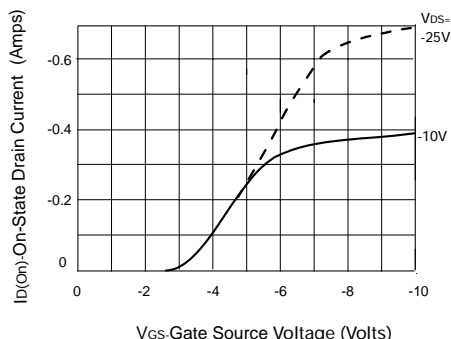
**Output Characteristics**



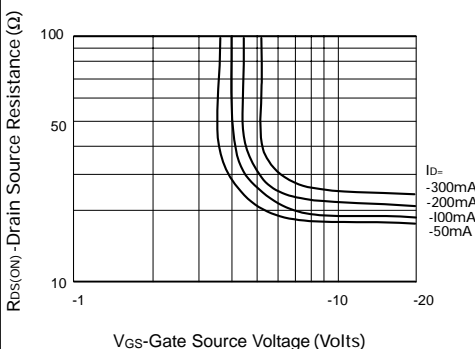
**Saturation Characteristics**



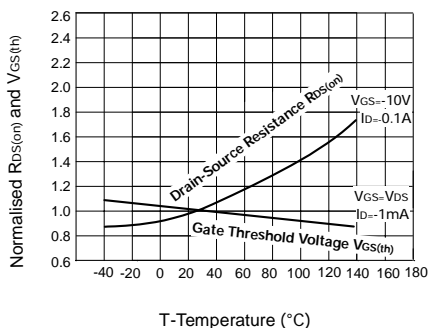
**Voltage Saturation Characteristics**



**Transfer Characteristics**



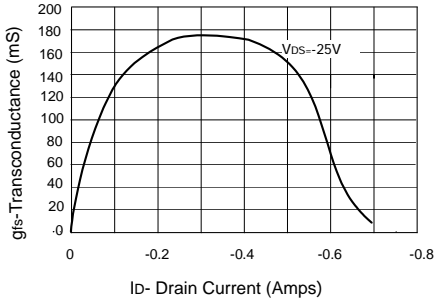
**On-resistance vs gate-source voltage**



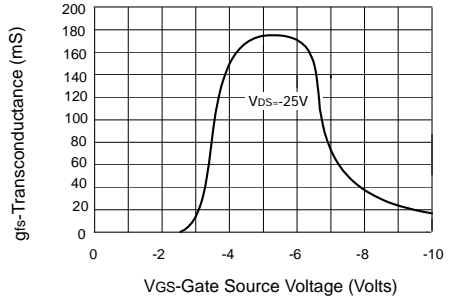
**Normalised  $R_{DS(on)}$  and  $V_{GS(th)}$  vs Temperature**

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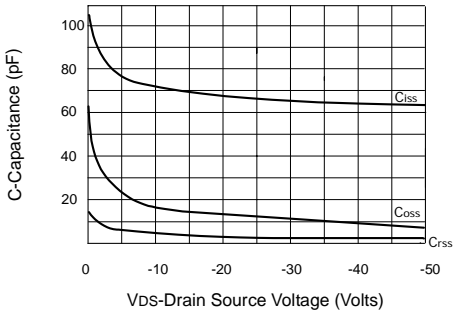
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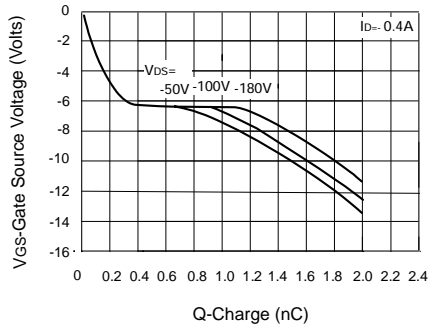
**Transconductance v drain current**



**Transconductance v gate-source voltage**



**Capacitance v drain-source voltage**



**Gate charge v gate-source voltage**