

P-Channel Enhancement Mode Field Effect Transistor

- **Features**

$V_{DS} -20V$, $V_{GS} 8V$, $I_D = -2.5A$

$R_{DS(on)} @V_{GS} -4.5V/I_D -2.8A$, $100m\Omega$ (Typ.)

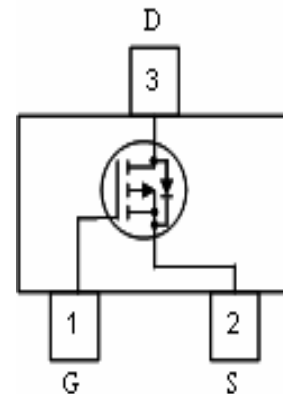
$R_{DS(on)} @V_{GS} -2.5V/I_D -2A$, $120m\Omega$ (Typ.)

- **General Description**

FDV302P is produced with high cell density DMOS trench technology, which is especially used to minimize on-state resistance. This device particularly suits low voltage applications such as portable equipment, power management and other battery powered circuits, and low in-line power dissipation are needed in a very small outline surface mount

package with excellent thermal and electrical capabilities.

- **Pin Configurations**



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 8	V
Drain Current (Continuous)	I_{D}	-2.5	A
Drain Current (Pulse)	I_{DM}	-10	A
Power Dissipation	P_{D}	350	mW
Operating Temperature/ Storage Temperature	$T_{\text{J}}/T_{\text{STG}}$	-55~150	$^{\circ}\text{C}$

● **Electrical Characteristics** @ $T_A=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}$, $I_{\text{D}} = -250\mu\text{A}$	-20	--	--	V
Drain Cut-off Current	I_{DSS}	$V_{\text{DS}} = -20\text{ V}$, $V_{\text{GS}} = 0\text{V}$	--	--	-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}} = \pm 8\text{ V}$, $V_{\text{DS}} = 0\text{V}$	--	--	± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$I_{\text{D}} = -250\text{ }\mu\text{A}$, $V_{\text{DS}} = V_{\text{GS}}$	-0.45	-0.75	-1.5	V
Drain-Source On-state Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = -4.5\text{V}$, $I_{\text{D}} = -2.8\text{ A}$	--	100	130	$\text{m}\Omega$
		$V_{\text{GS}} = -2.5\text{V}$, $I_{\text{D}} = -2.5\text{A}$	--	120	200	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{\text{DS}} = -5\text{V}$, $I_{\text{D}} = -2.8\text{A}$	--	6.5	--	S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{\text{DS}} = -6\text{V}$, $V_{\text{GS}} = 0\text{V}$ $f = 1\text{ MHz}$	--	415	--	pF
Output Capacitance	C_{OSS}		--	223	--	pF
Feedback Capacitance	C_{RSS}		--	87	--	pF
SWITCHING CHARACTERISTICS						
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = -6\text{V}$, $R_{\text{L}} = 6\text{ }\Omega$, $I_{\text{D}} = -1.0\text{A}$,	--	13	25	ns
Turn-off Delay Time	$t_{\text{d}(\text{off})}$	$V_{\text{GEN}} = -4.5\text{V}$, $R_{\text{G}} = 6\text{ }\Omega$	--	42	70	ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_{\text{S}} = -1.6\text{A}$, $V_{\text{GS}} = 0\text{V}$	-0.5	--	-1.2	V

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test: $\text{PW} \leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. For design AID only, not subject to production testing.
4. Switching time is essentially independent of operating temperature.

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Typical Performance Characteristics

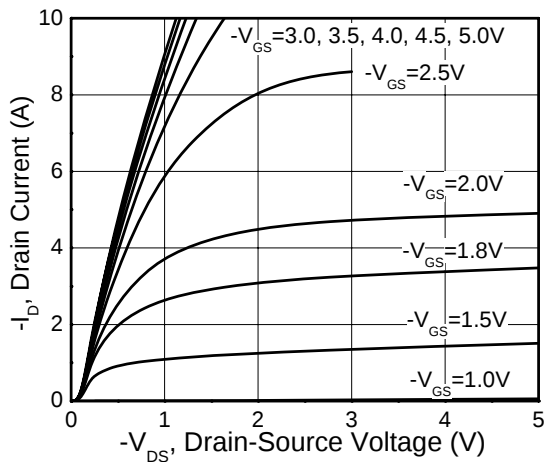


Figure 1. Output Characteristics

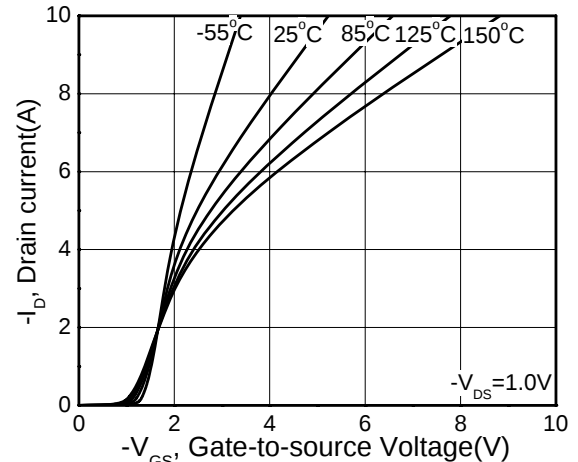


Figure 2. Transfer Characteristics

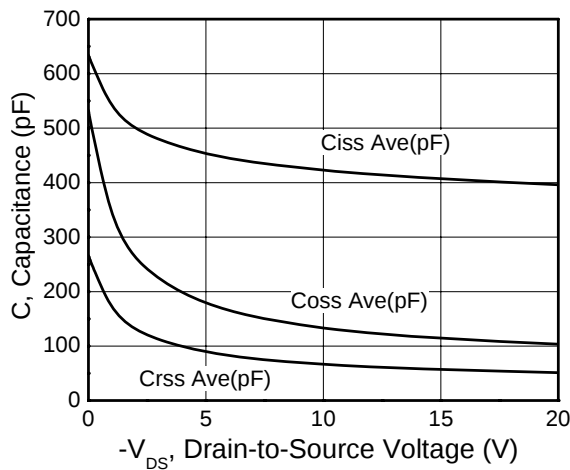


Figure 3. Capacitance

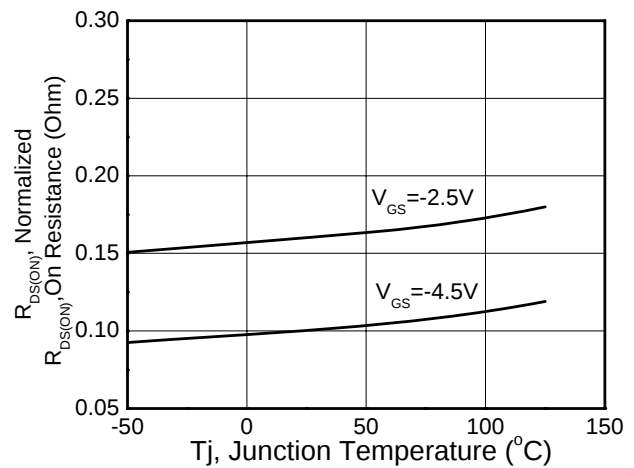


Figure 4. On Resistance Vs. Temperature

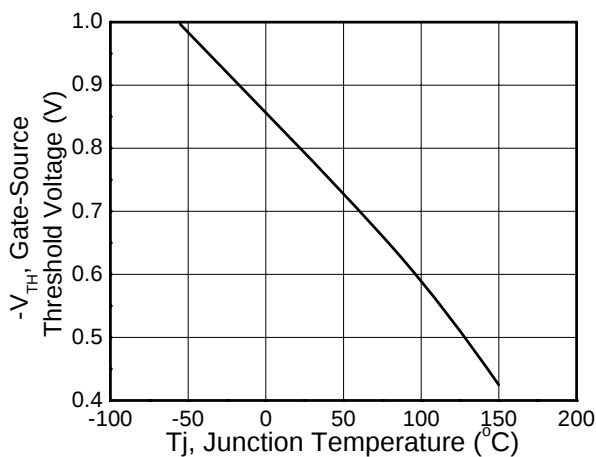


Figure 5. Gate Threshold Vs. Temperature

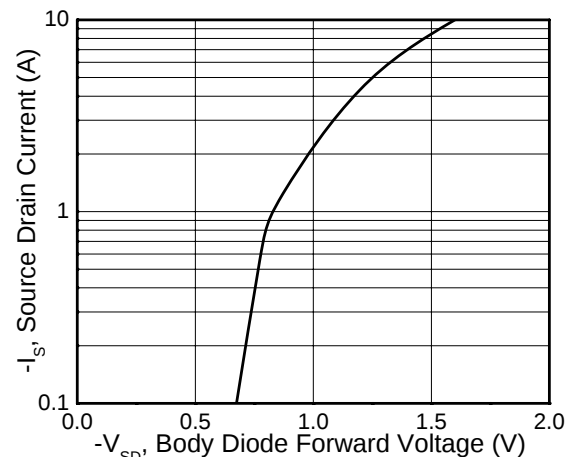
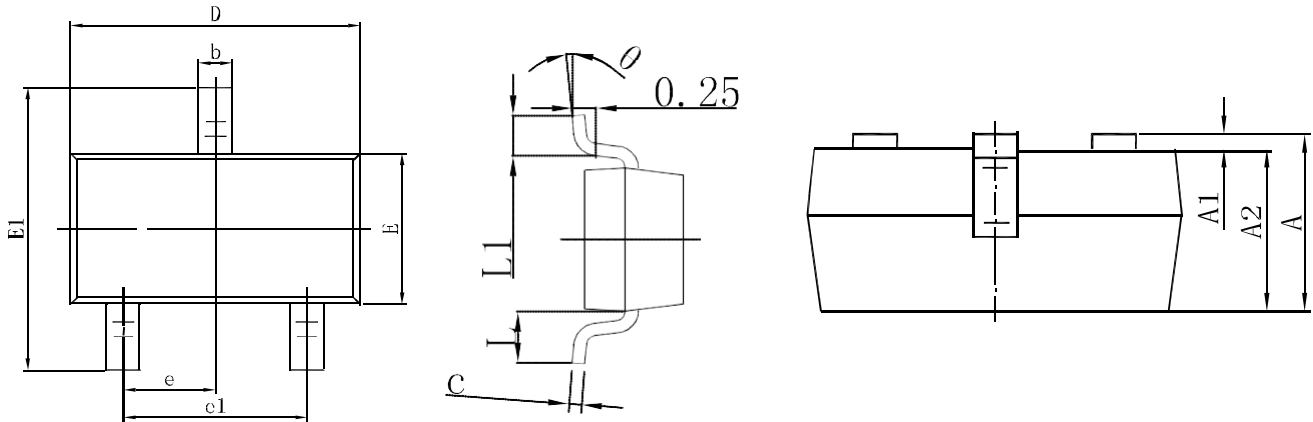


Figure 6. Body Diode Forward Voltage Vs. Source Current

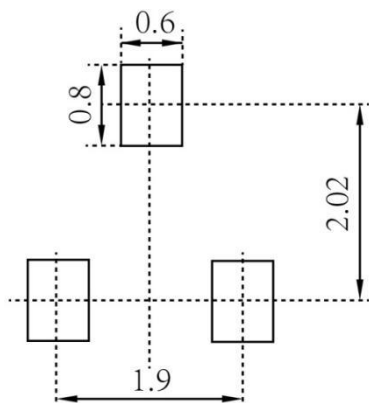
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SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



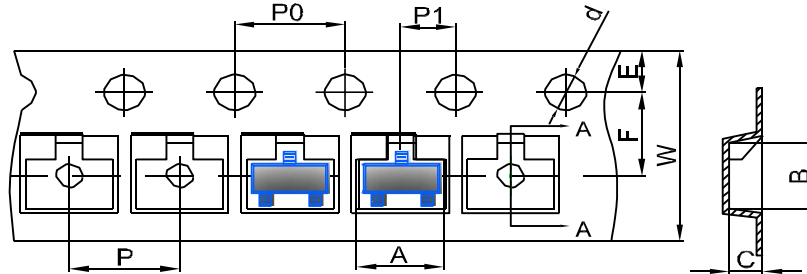
Note:

1. Controlling dimension: in millimeters
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

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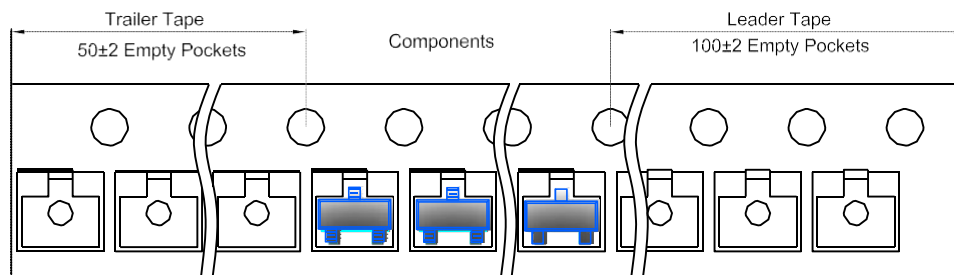
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

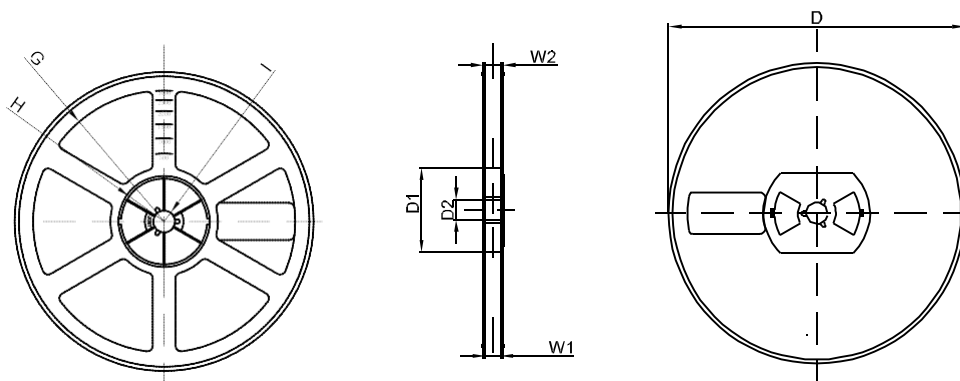


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

SOT-23 Tape Leader and Trailer



SOT-23 Reel



	DIMENSIONS ARE IN MILLIMETER							
REEL OPTION	D	D1	D2	G	H	I	W1	W2
7" DIA	Ø178	54.40	13.00	R78	R25.60	R6.50	9.50	12.30
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1