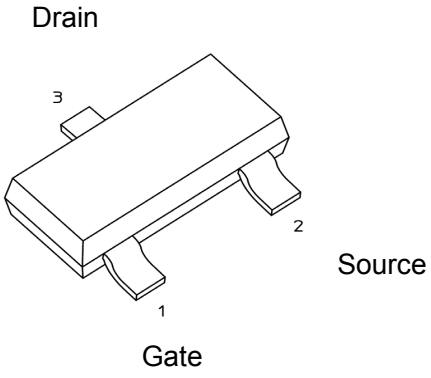
FDV301N

High Speed Switching Applications

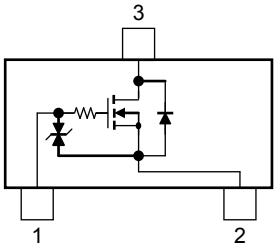
- ESD protected gate
- Low ON-resistance $R_{DS(on)}$ = 2.8 Ω (typ.) (@V_{GS} = 10 V)
  $R_{DS(on)}$ = 3.1 Ω (typ.) (@V_{GS} = 5 V)
  $R_{DS(on)}$ = 3.2 Ω (typ.) (@V_{GS} = 4.5 V)



SOT23

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Drain–source voltage		V_{DSS}	60	V
Gate–source voltage		V_{GSS}	± 20	V
Drain current (Note1)	DC	I_D	200	mA
	Pulse	I_{DP} (Note 2)	760	
Power dissipation		P_D (Note 3)	320	mW
		P_D (Note 4)	1000	
Channel temperature		T_{ch}	150	°C
Storage temperature		T_{stg}	−55 to 150	°C



Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Note 1: The channel temperature should not exceed 150°C during use.

Note 2: Pulse width ≤ 10 μs, Duty ≤ 1%

Note 3: Mounted on an FR4 board
(25.4 mm × 25.4 mm × 1.6 mm, Cu Pad: 0.42 mm^2 x 3)

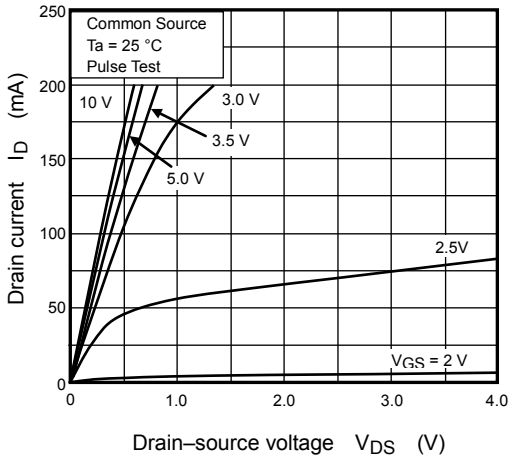
Note 4: Mounted on an FR4 board
(25.4 mm × 25.4 mm × 1.6 mm, Cu Pad: 645 mm^2)

Electrical Characteristics (Ta = 25°C, Otherwise specified)

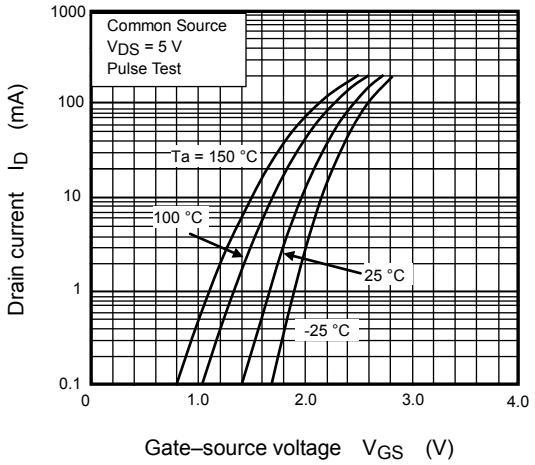
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Drain-source breakdown voltage		$V_{(BR)\ DSS}$	I_D = 250 μA, V_{GS} = 0 V	60	—	—	V
Drain cutoff current		I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V	—	—	1	μA
			V_{DS} = 60 V, V_{GS} = 0 V, Tj=150 °C	—	—	200	
Gate leakage current		I_{GSS}	V_{GS} = ±16 V, V_{DS} = 0 V	—	—	±2	μA
			V_{GS} = ±10 V, V_{DS} = 0 V	—	—	±0.5	
			V_{GS} = ±5 V, V_{DS} = 0 V	—	—	±0.1	
Gate threshold voltage		V_{th}	I_D = 250 μA, V_{DS} = V_{GS}	1.1	—	2.1	V
Forward transfer admittance		$\|Y_{fs}\|$	V_{DS} = 10 V, I_D = 200 mA (Note 5)	—	450	—	mS
Drain-source ON-resistance		$R_{DS\ (ON)}$ (Note 5)	I_D = 100 mA, V_{GS} = 10 V	—	2.8	3.9	Ω
			I_D = 100 mA, V_{GS} = 10 V, Tj=150 °C	—	5.4	8.1	
			I_D = 100 mA, V_{GS} = 5 V	—	3.1	4.4	
			I_D = 100 mA, V_{GS} = 4.5 V	—	3.2	4.7	
Total Gate Charge		$Q_{G(tot)}$	V_{DS} = 30 V, I_D = 380 mA V_{GS} = 4.5 V	—	0.27	0.35	nC
Gate-Source Charge		Q_{GS}		—	0.08	—	
Gate-Drain Charge		Q_{GD}		—	0.08	—	
Input capacitance		C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	—	11	17	pF
Output capacitance		C_{oss}		—	3	—	
Reverse transfer capacitance		C_{rss}		—	0.7	—	
Switching time	Turn-on delay time	$t_{d(on)}$	V_{DD} = 40 V, I_D = 160 mA V_{GS} = 0 V to 10 V, R_G = 50 Ω	—	2	4	ns
	Rise time	t_r		—	3	—	
	Turn-off delay time	$t_{d(off)}$		—	7	14	
	Fall time	t_f		—	24	—	
Drain-source forward voltage		V_{DSF}	I_D = -115 mA, V_{GS} = 0 V (Note 5)	—	-0.87	-1.2	V

Note 5: Pulse test

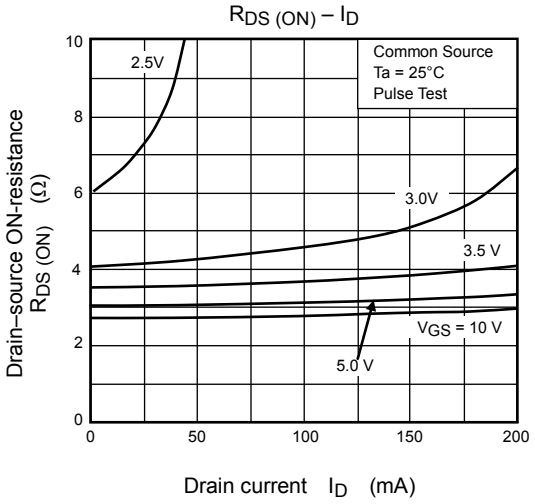
$I_D - V_{DS}$



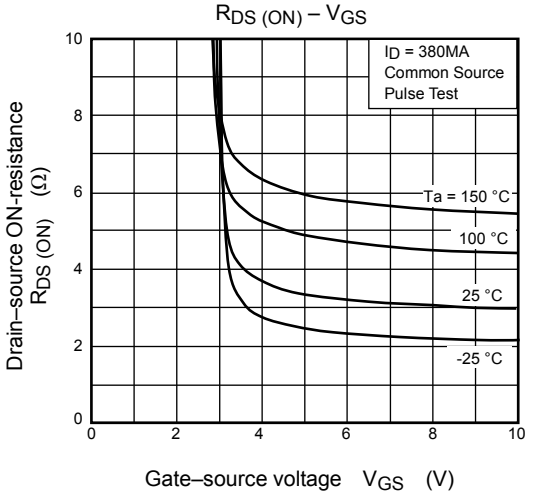
$I_D - V_{GS}$



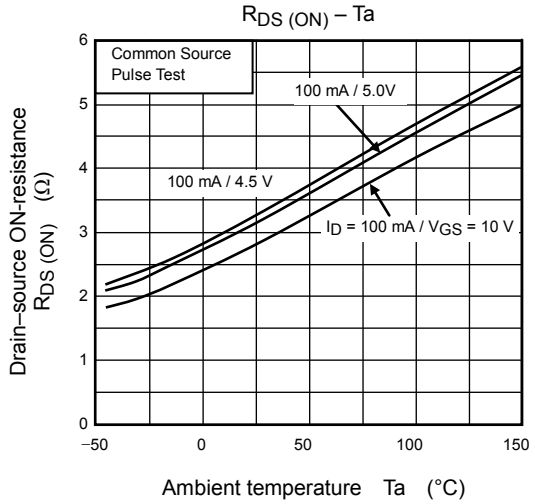
$R_{DS\ (ON)} - I_D$



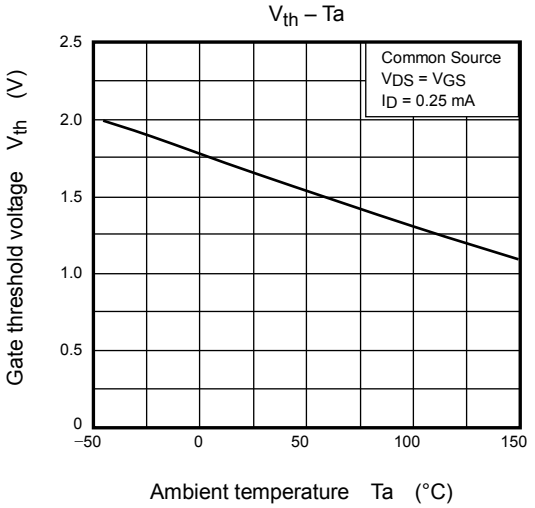
$R_{DS\ (ON)} - V_{GS}$



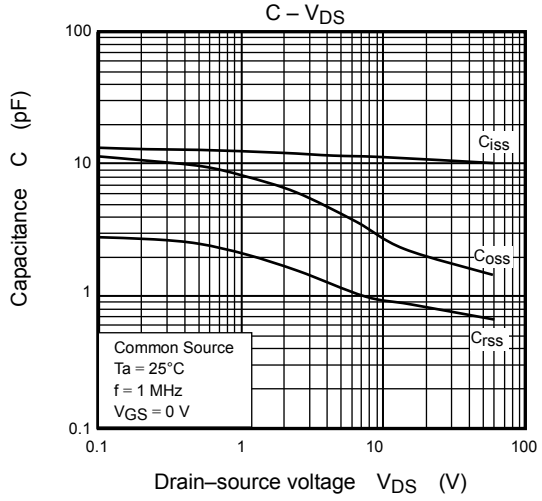
$R_{DS\ (ON)} - Ta$



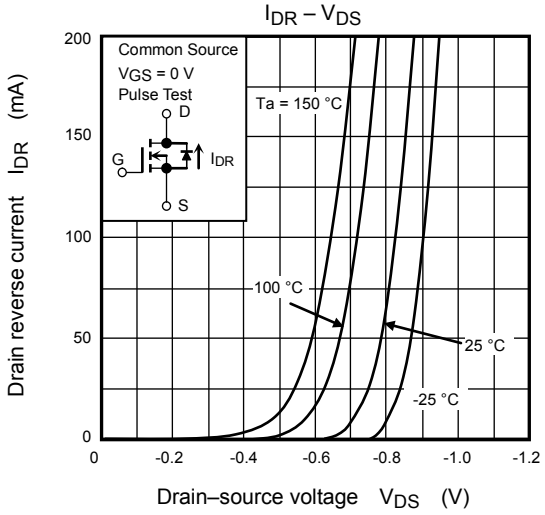
$V_{th} - Ta$



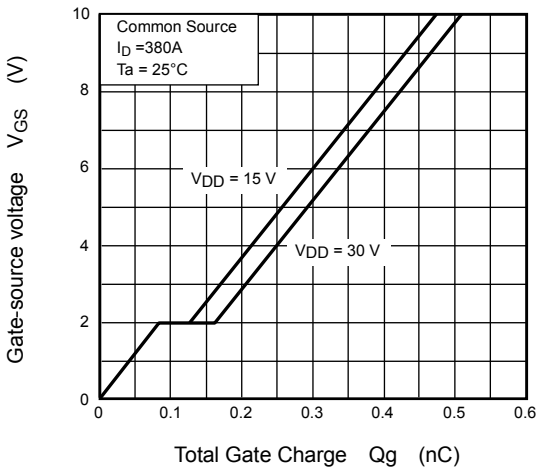
C – V_{DS}



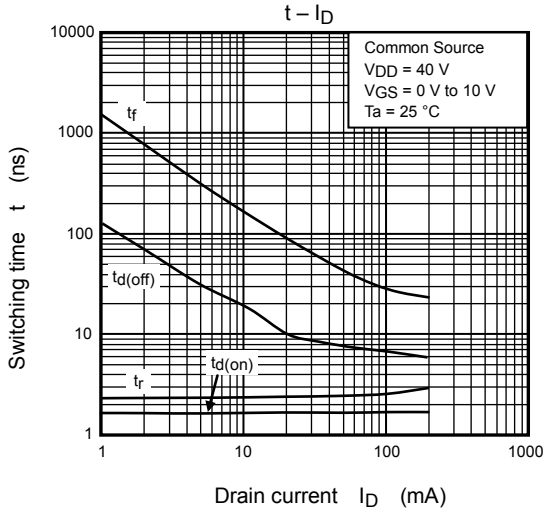
I_{DR} – V_{DS}



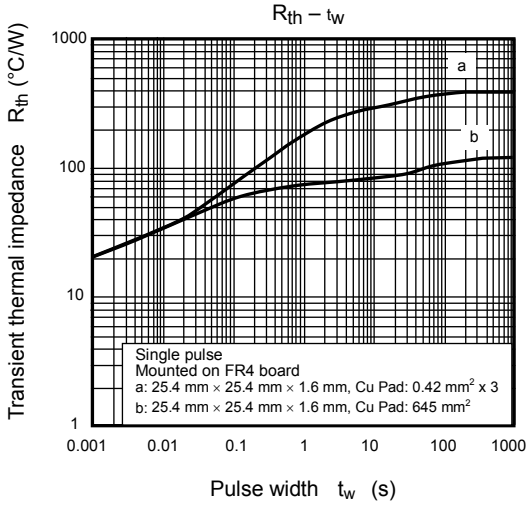
Dynamic Input Characteristic



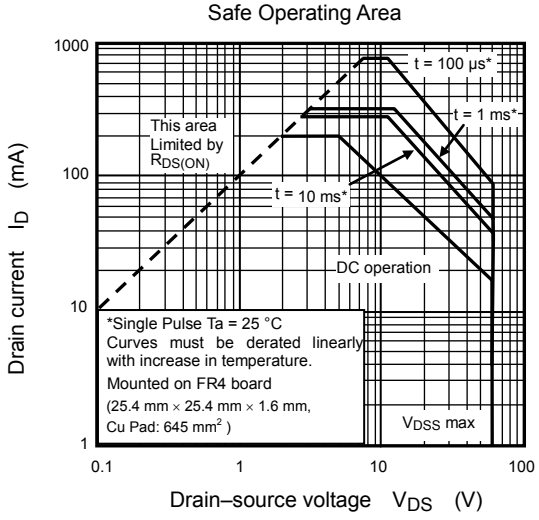
t – I_D



R_{th} – t_w

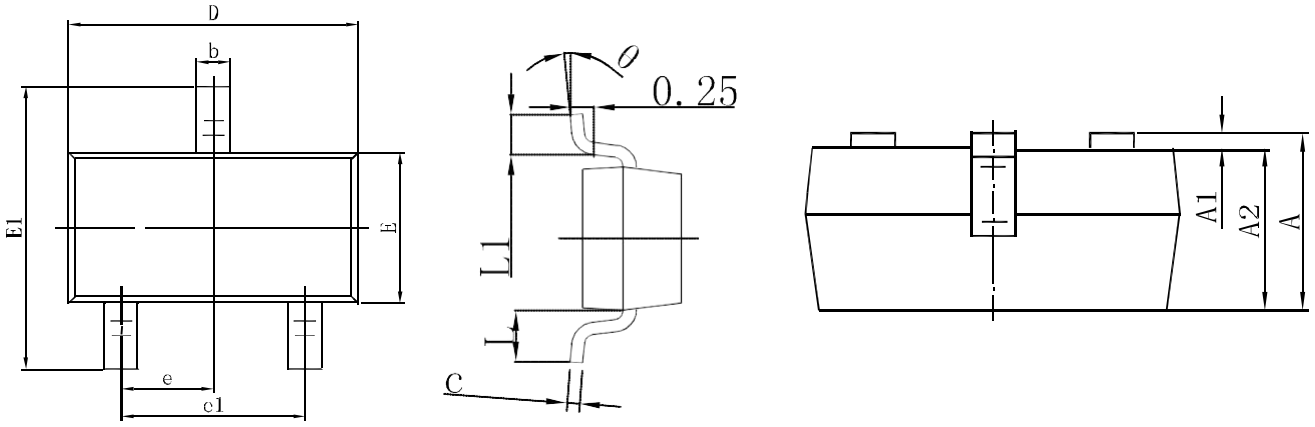


Safe Operating Area



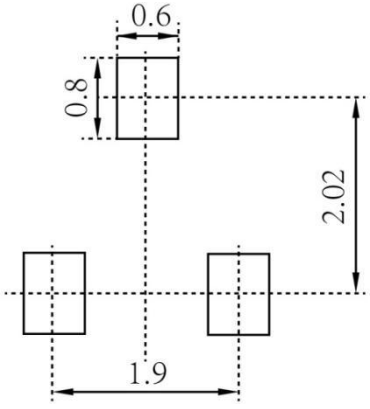
Note: The above characteristics curves are presented for reference only and not guaranteed by production test.

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:

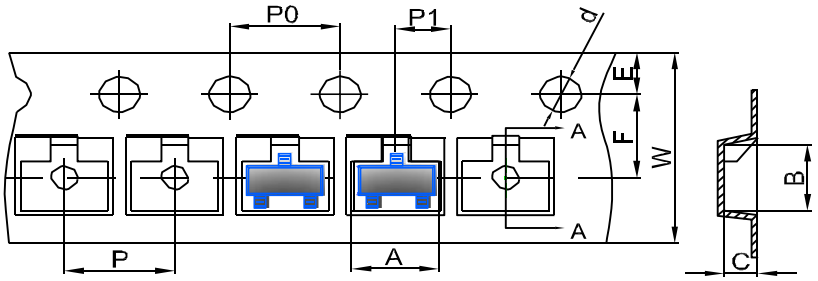
1.Controlling dimension: in millimeters

2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

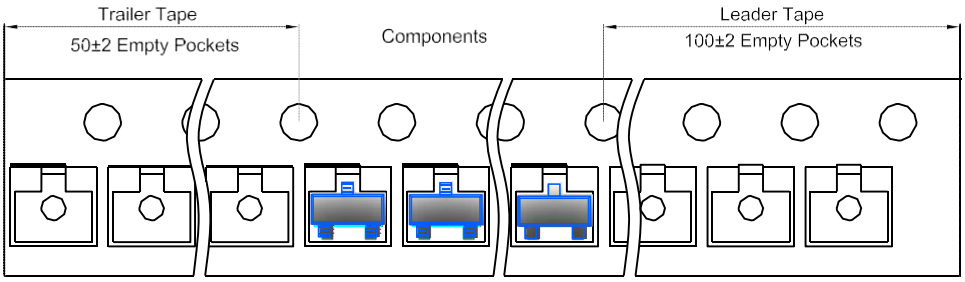
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

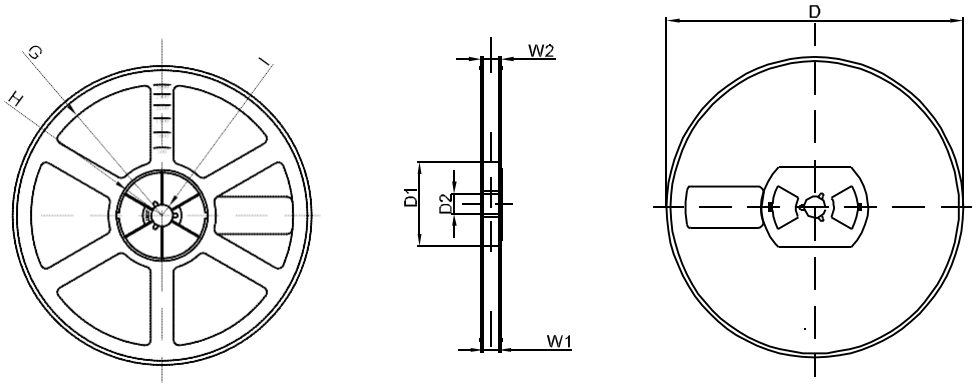


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

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