



## P-Channel Enhancement Mode Field Effect Transistor

### PRODUCT SUMMARY

V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (mΩ) Max
-20V	-3.4A	57 @ V <sub>GS</sub> =-4.5V
		78 @ V <sub>GS</sub> =-4.0V
		83 @ V <sub>GS</sub> =-3.7V
		93 @ V <sub>GS</sub> =-3.1V
		115 @ V <sub>GS</sub> =-2.5V

### FEATURES

- Super high dense cell design for low R<sub>DS(ON)</sub>.
- Rugged and reliable.
- Surface Mount Package.



### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Limit	Units
V <sub>DS</sub>	Drain-Source Voltage	-20	V
V <sub>GS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub>	Drain Current-Continuous <sup>a</sup>	T <sub>A</sub> =25°C	-3.4
		T <sub>A</sub> =70°C	-2.7
I <sub>DM</sub>	-Pulsed <sup>b</sup>	-13	A
P <sub>D</sub>	Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> =25°C	1.25
		T <sub>A</sub> =70°C	0.8
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 to 150	°C

### THERMAL CHARACTERISTICS

Symbol	Parameter	Limit	Units
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient <sup>a</sup>	100	°C/W

# STS2305

Ver 1.0

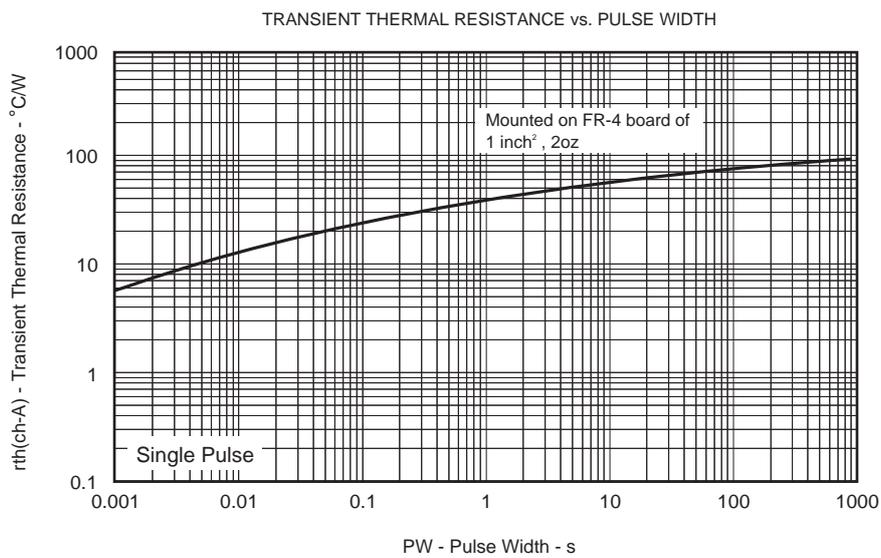
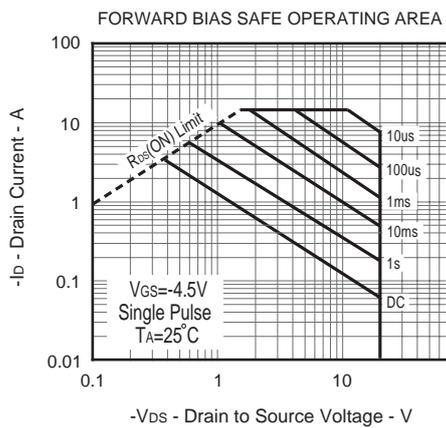
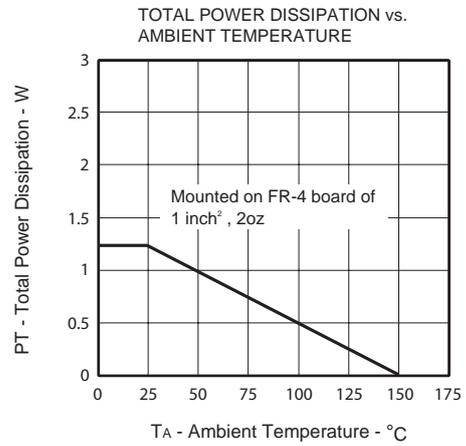
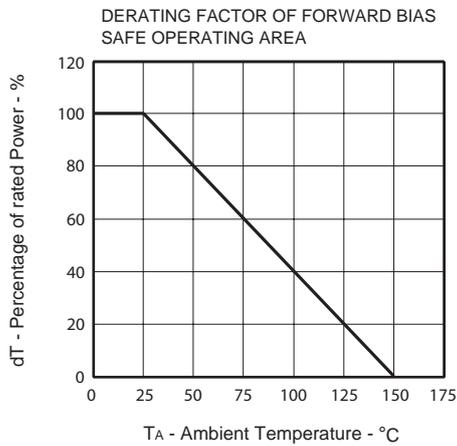
## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
BV <sub>bss</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =-250uA	-20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-16V , V <sub>GS</sub> =0V			1	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> = ±12V , V <sub>DS</sub> =0V			±100	nA
<b>ON CHARACTERISTICS</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-1mA	-0.5	-0.9	-1.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-1.7A	46	57	74	m ohm
		V <sub>GS</sub> =-4.0V , I <sub>D</sub> =-1.7A	48	60	78	m ohm
		V <sub>GS</sub> =-3.7V , I <sub>D</sub> =-1.7A	51	63	83	m ohm
		V <sub>GS</sub> =-3.1V , I <sub>D</sub> =-1.7A	56	70	93	m ohm
		V <sub>GS</sub> =-2.5V , I <sub>D</sub> =-1.7A	68	85	115	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V , I <sub>D</sub> =-1.7A		7		S
<b>DYNAMIC CHARACTERISTICS <sup>c</sup></b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V f=1.0MHz		402		pF
C <sub>OSS</sub>	Output Capacitance			135		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			120		pF
<b>SWITCHING CHARACTERISTICS <sup>c</sup></b>						
t <sub>D(ON)</sub>	Turn-On Delay Time	V <sub>DD</sub> =-16V I <sub>D</sub> =-1.7A V <sub>GS</sub> =-4.5V R <sub>GEN</sub> = 6 ohm		13		ns
t <sub>r</sub>	Rise Time			33		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time			17		ns
t <sub>f</sub>	Fall Time			48		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-16V, I <sub>D</sub> =-3.4A, V <sub>GS</sub> =-4.5V		7.2		nC
Q <sub>gs</sub>	Gate-Source Charge			0.4		nC
Q <sub>gd</sub>	Gate-Drain Charge			3.6		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =-1.4A		-0.81	-1.2	V
<b>Notes</b>						
a.Surface Mounted on FR4 Board, t < 10sec.						
b.Pulse Test:Pulse Width < 10us, Duty Cycle < 1%.						
c.Guaranteed by design, not subject to production testing.						

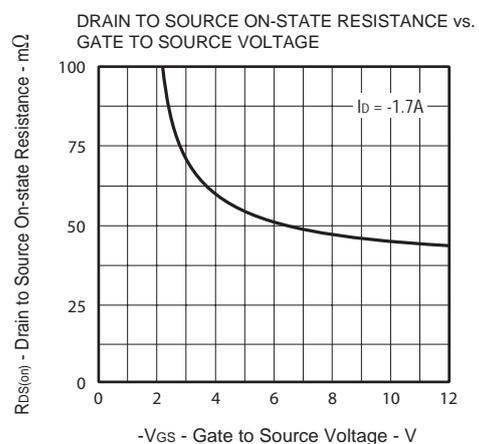
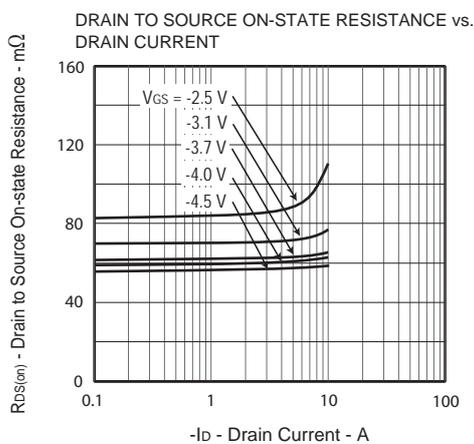
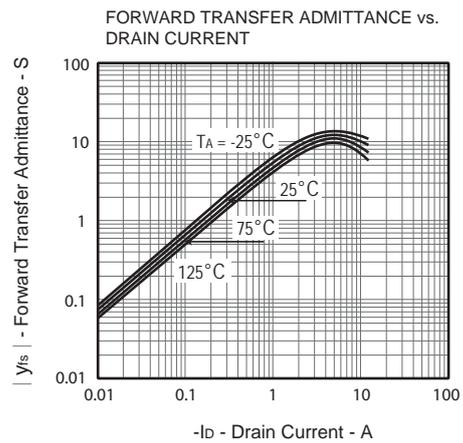
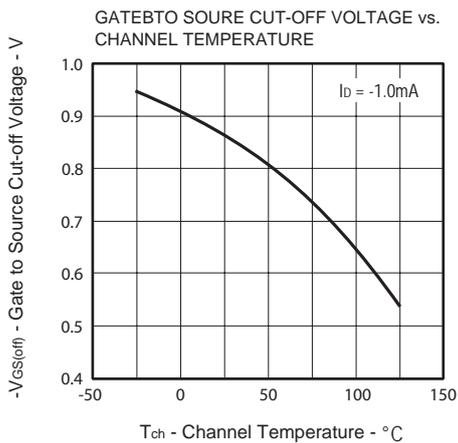
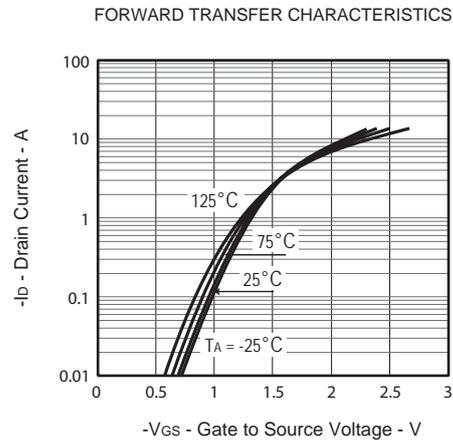
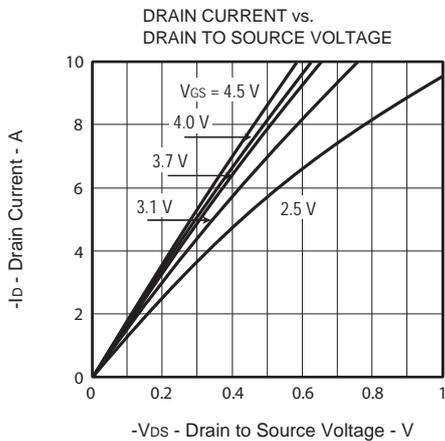
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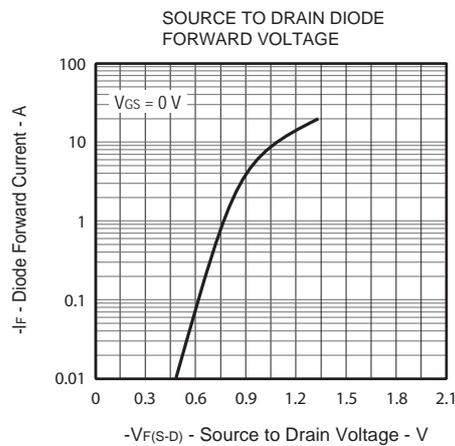
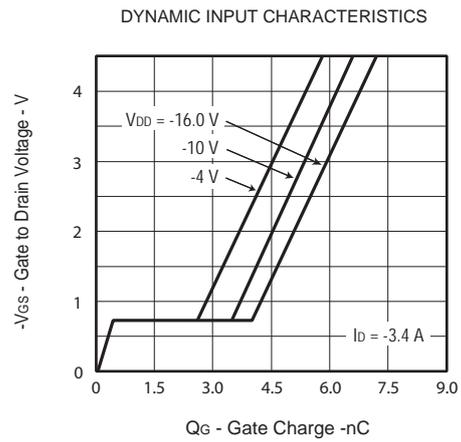
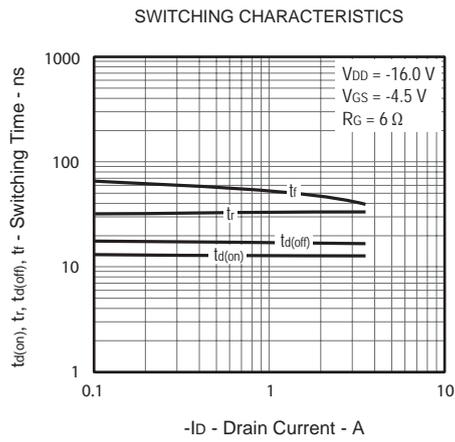
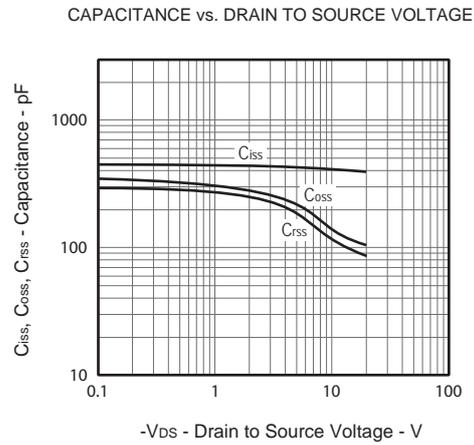
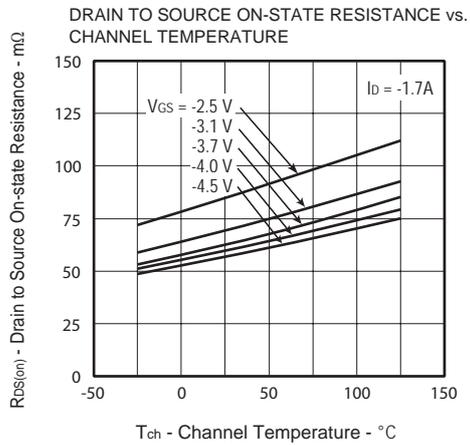
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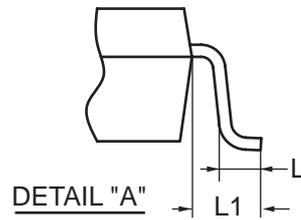
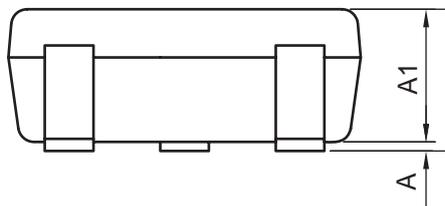
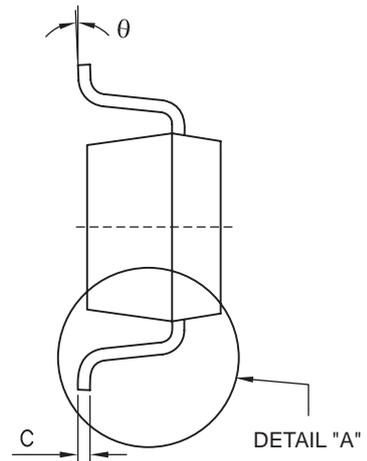
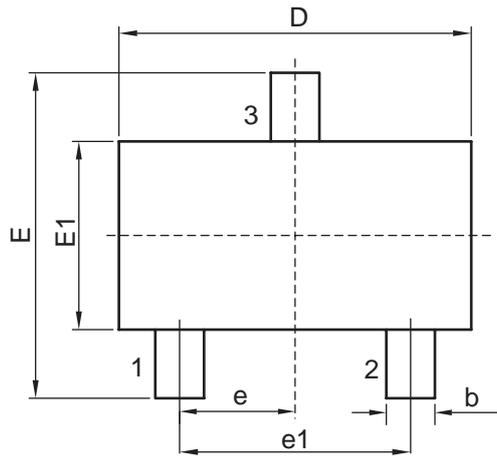
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## PACKAGE OUTLINE DIMENSIONS

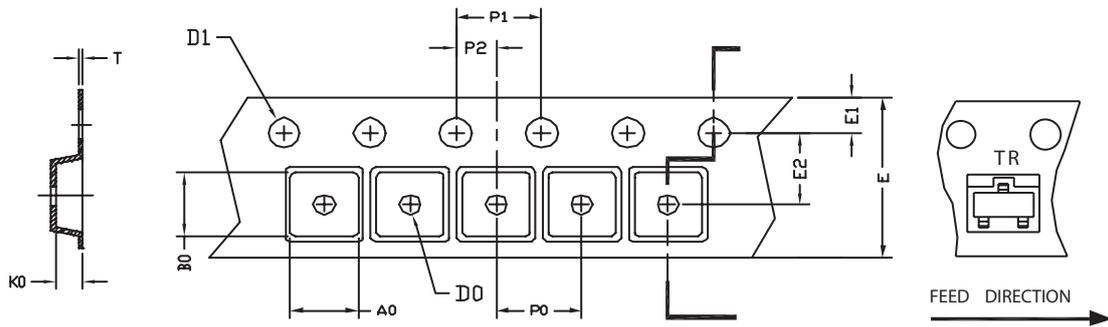
### SOT 23



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
D	2.700	3.100	0.106	0.122
E	2.200	3.000	0.087	0.118
E1	1.200	1.700	0.047	0.067
e	0.850	1.150	0.033	0.045
e1	1.800	2.100	0.071	0.083
b	0.300	0.510	0.019	0.020
C	0.080	0.200	0.003	0.008
A	0.000	0.150	0.000	0.006
A1	0.887	1.300	0.035	0.051
L	0.450 REF.		0.018 REF.	
L1	0.600 REF.		0.024 REF.	
θ	0°	10°	0°	10°

## SOT23 Tape and Reel Data

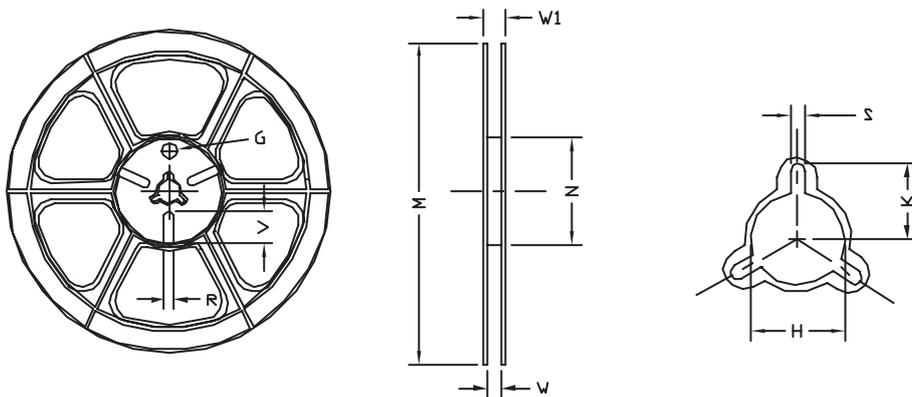
### SOT23-3L Carrier Tape



UNIT:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT23-3L	3.15 ±0.10	2.77 ±0.10	1.22 ±0.10	1.00 +0.05	1.50 +0.10	8.00 +0.30 -0.10	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.22 ±0.04

### SOT23-3L Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
8mm	178	178 ±1	60 ±1	9.00 ±0.5	12.00 ±0.5	13.5 ±0.5	10.5	2.00 ±0.5	10.0	5.00	18.00