



N-Channel Enhancement Mode Field Effect Transistor

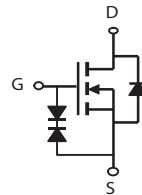
PRODUCT SUMMARY

V _{DS}	I _D	R _{DS(ON)} (m Ω) Max
20V	4.5A	40 @ V _{GS} = 4.5V 50 @ V _{GS} = 2.5V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- Surface Mount Package.
- ESD Protected.

SOT-23-3L



ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±10	V
Drain Current-Continuous ^a @ T _J =25°C -Pulsed ^b	I _D	4.5	A
	I _{DM}	17	A
Drain-Source Diode Forward Current ^a	I _S	1.25	A
Maximum Power Dissipation ^a	P _D	1.25	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R θ JA	100	°C/W
--	---------------	-----	------

STS 2306A

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±10	uA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D = 250uA	0.5	0.9	1.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D = 4.5 A		30	40	m ohm
		V _{GS} =2.5V, I _D = 4.0A		40	50	m ohm
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 4.5A		16		S
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} =10V, V _{GS} = 0V f=1.0MHz		540		pF
Output Capacitance	C _{OSS}			160		pF
Reverse Transfer Capacitance	C _{RSS}			100		pF
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 10V, I _D = 1A, V _{GEN} = 4.5V, R _L = 10 ohm R _{GEN} = 10 ohm		15		ns
Rise Time	t _r			20		ns
Turn-Off Delay Time	t _{D(OFF)}			36		ns
Fall Time	t _f			11		ns
Total Gate Charge	Q _g	V _{DS} =10V, I _D =4.5A, V _{GS} =4.5V		6.4		nC
		V _{DS} =10V, I _D =4.5A, V _{GS} =2.5V		4.6		nC
Gate-Source Charge	Q _{gs}	V _{DS} =10V, I _D = 4.5 A		1.1		nC
Gate-Drain Charge	Q _{gd}	V _{GS} =4.5V		2.8		nC

STS 2306A

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS ^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}, I_S = 1.25\text{A}$		0.76	1.2	V

Notes

- a. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.
- b. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- c. Guaranteed by design, not subject to production testing.

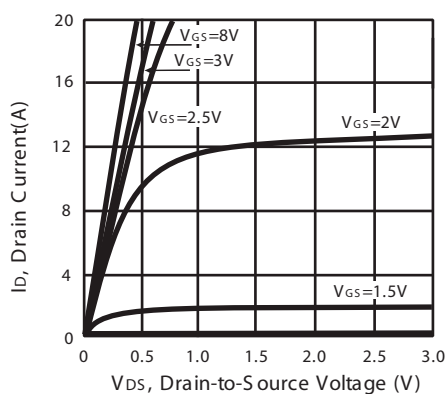


Figure 1. Output Characteristics

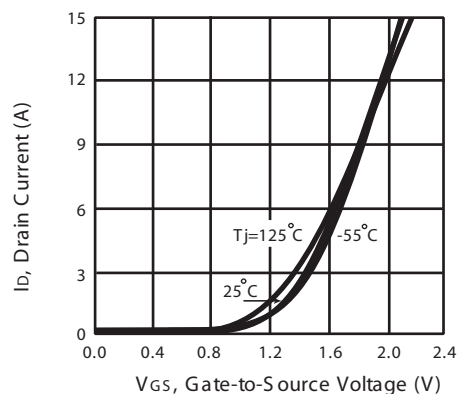


Figure 2. Transfer Characteristics

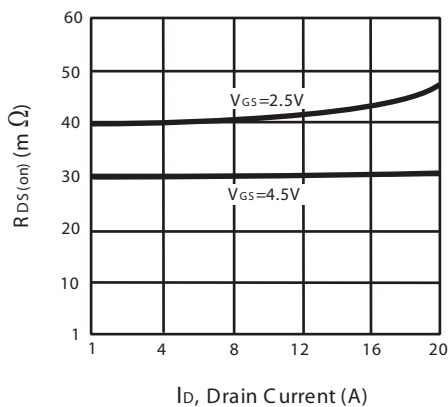


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

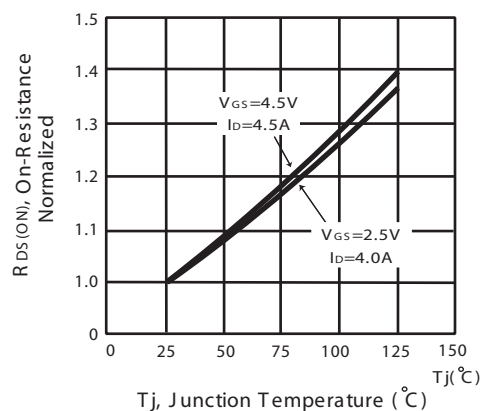


Figure 4. On-Resistance Variation with Drain Current and Temperature

STS 2306A

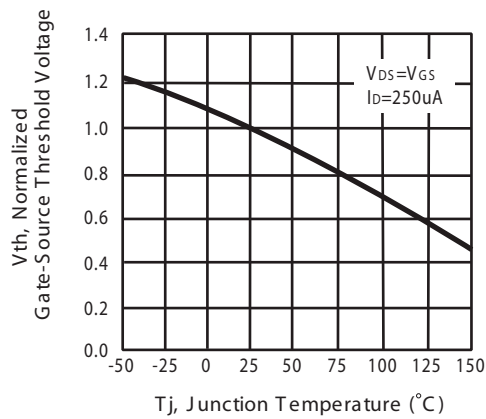


Figure 5. Gate Threshold Variation with Temperature

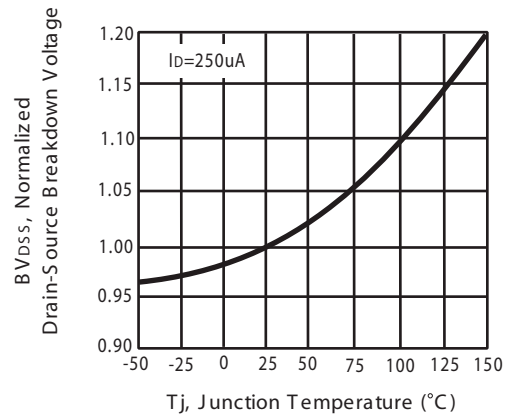


Figure 6. Breakdown Voltage Variation with Temperature

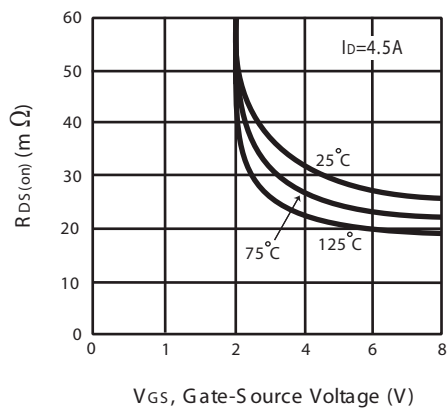


Figure 7. On-Resistance vs. Gate-Source Voltage

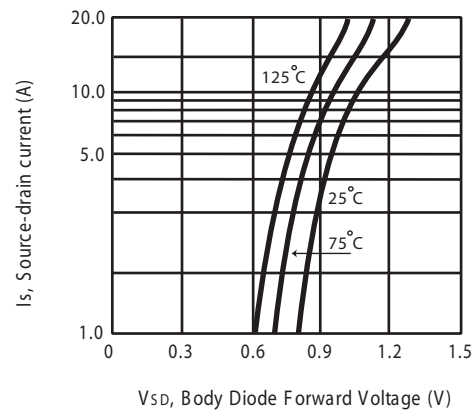
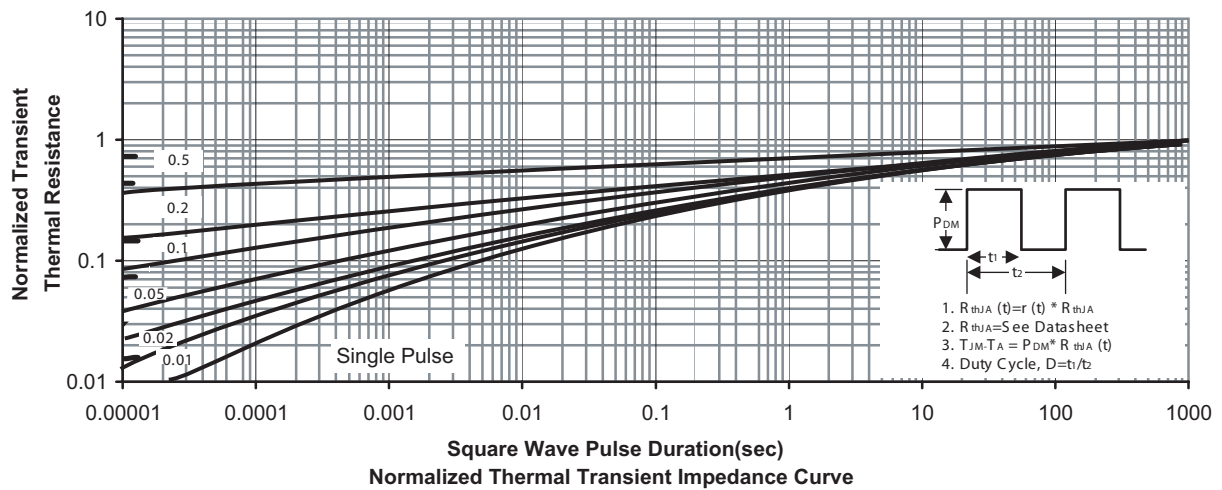
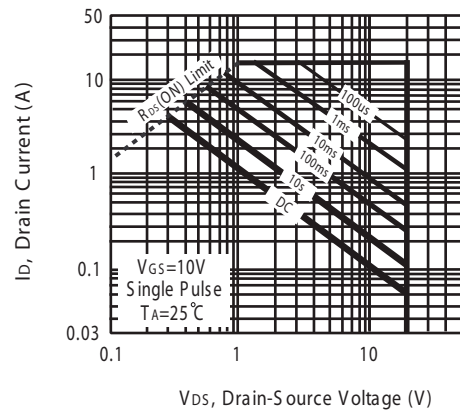
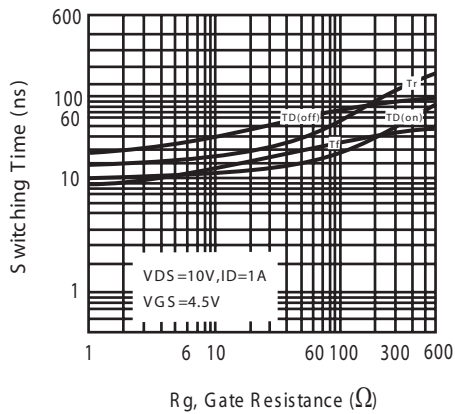
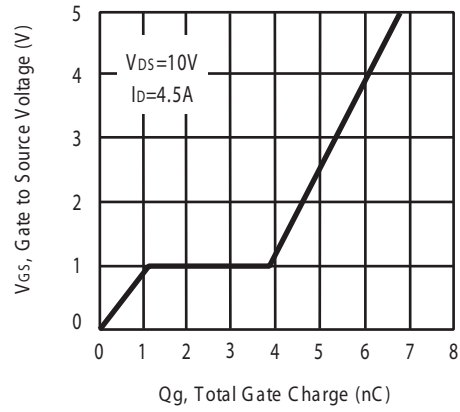
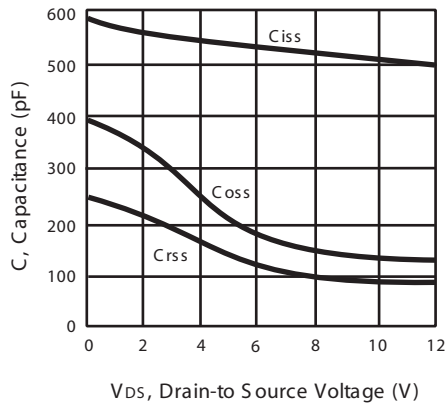


Figure 8. Body Diode Forward Voltage Variation with Source Current

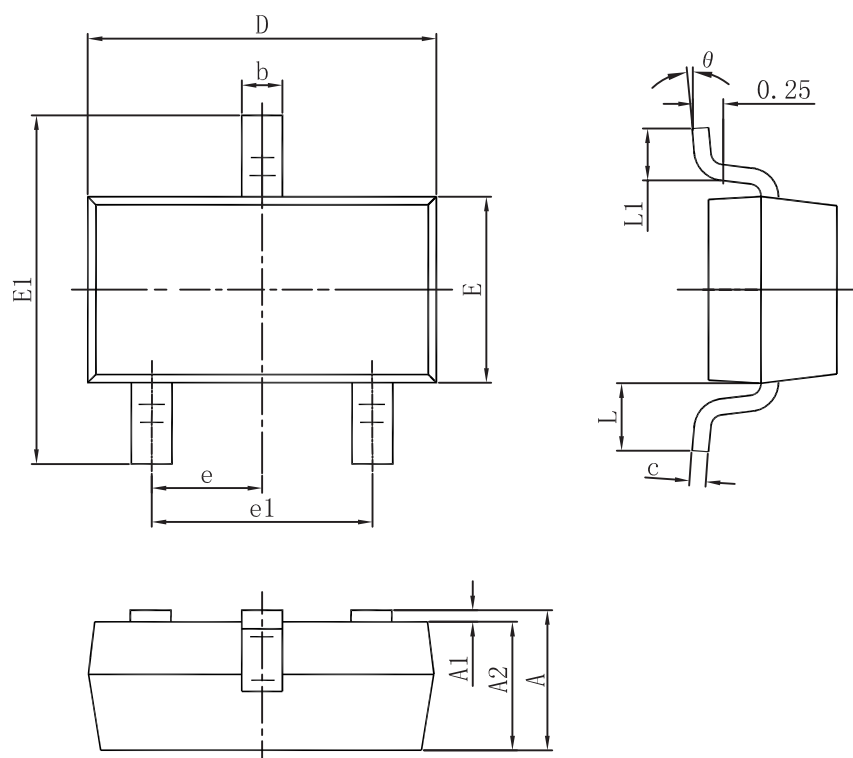
STS 2306A



STS 2306A

SOT23-3L

PACKAGE OUTLINE DIMENSIONS

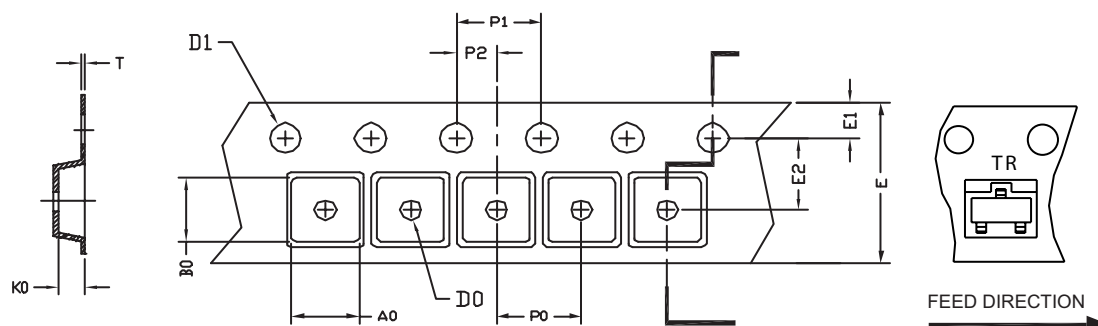


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.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

STS 2306A

SOT-23-3L Tape and Reel Data

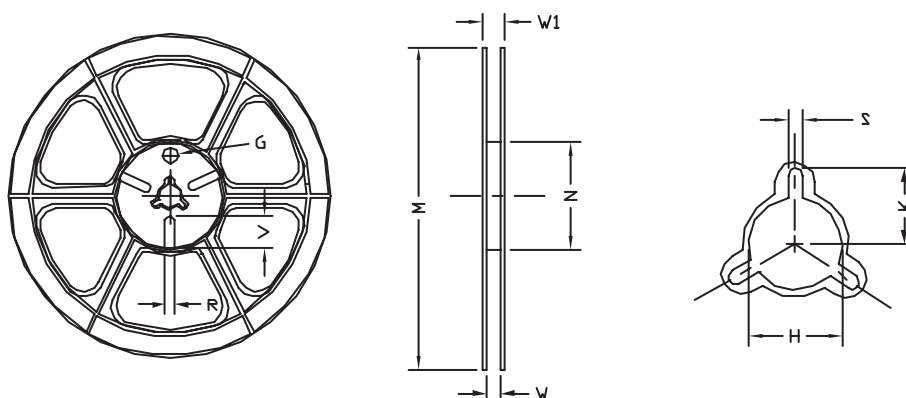
SOT-23-3L Carrier Tape



UNIT:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT-23	3.20 ±0.10	3.00 ±0.10	1.33 ±0.10	1.00 +0.25	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	0.20 ±0.02

SOT-23-3L 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