SamHop Microelectronics Corp.

STU402D

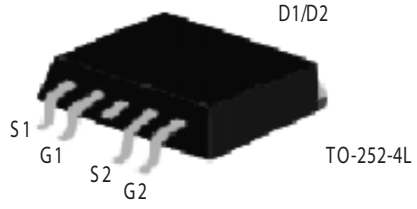
MAY.03 2006

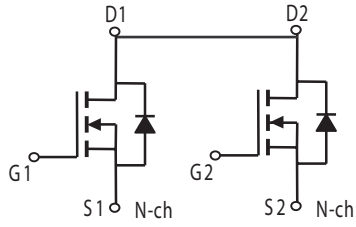
Dual N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
40V	16A	30 @ V_{GS} = 10V 40 @ V_{GS} =4.5V

FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- TO252-4L package.





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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous @ Ta	25°C	I_D	16	A
	70°C		13.8	A
-Pulsed [a]		I_{DM}	50	A
Drain-Source Diode Forward Current		I_S	8	A
Maximum Power Dissipation	Ta= 25°C	P_D	11	W
	Ta=70°C		7.7	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	13.6	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	120	°C/W

STU402D

ELECTRICAL CHARACTERISTICS (T_A =25°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	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V, V_{GS}=0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=± 20V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	1.8	3.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=8A		23	30	m-ohm
		V_{GS}=4.5V, I_D=6A		32	40	m-ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}=5V, V_{GS}=4.5V	10			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=8A		12		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V f=1.0MHz		770		pF
Output Capacitance	C_{OSS}			103		pF
Reverse Transfer Capacitance	C_{RSS}			65		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=20V, I_D=1A, V_{GS}=10V, R_L=20 ohm R_{GEN}=6 ohm		13		ns
Rise Time	t_r			10		ns
Turn-Off Delay Time	$t_{D(OFF)}$			27		ns
Fall Time	t_f			6		ns
Total Gate Charge (10V)	Q_g	V_{DS}=28V, I_D=8A, V_{GS}=10V		17		nC
Total Gate Charge (4.5V)	Q_g			8.7		nC
Gate-Source Charge	Q_{gs}			1.9		nC
Gate-Drain Charge	Q_{gd}			4.5		nC

STU402D

ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [a]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is = 8A		0.96	1.3	V

Notes

a.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.

b.Guaranteed by design, not subject to production testing.

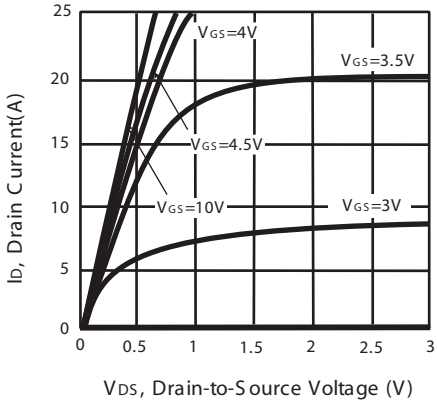


Figure 1. Output Characteristics

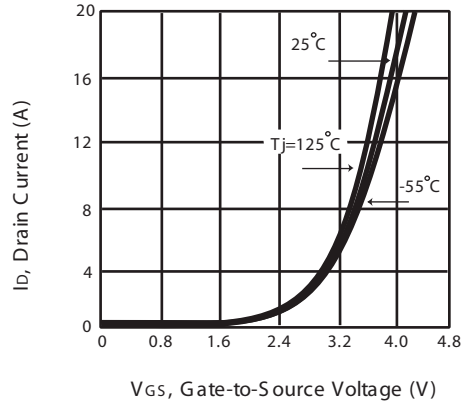


Figure 2. Transfer Characteristics

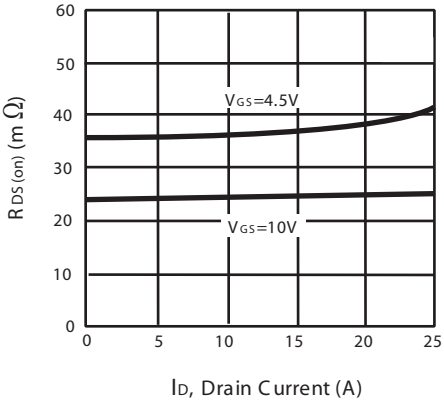


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

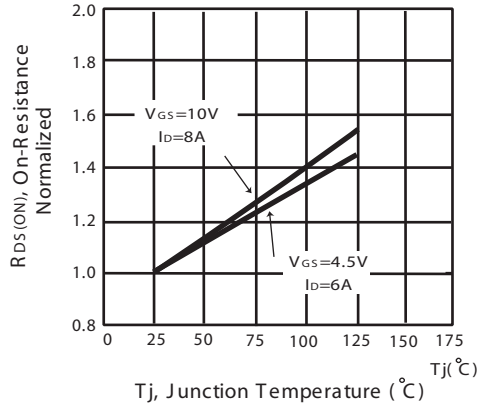


Figure 4. On-Resistance Variation with Drain Current and Temperature

STU402D

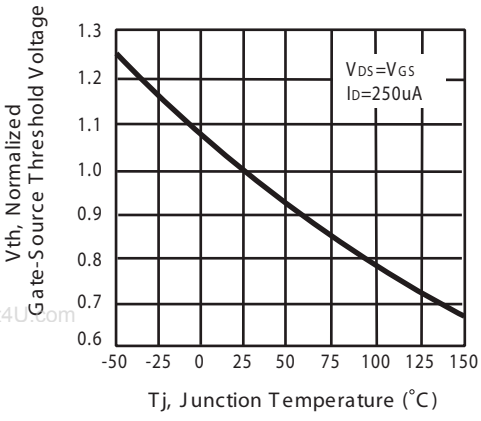


Figure 5. Gate Threshold Variation with Temperature

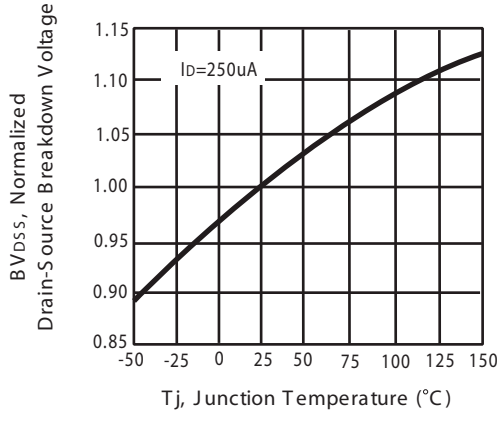


Figure 6. Breakdown Voltage Variation with Temperature

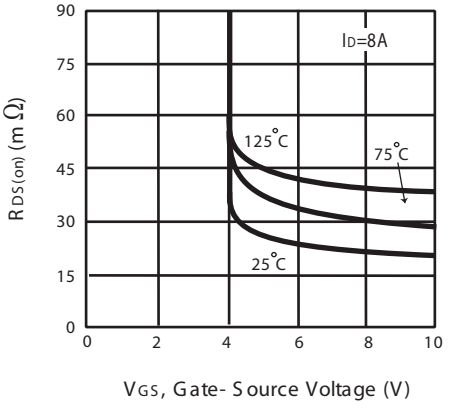


Figure 7. On-Resistance vs. Gate-Source Voltage

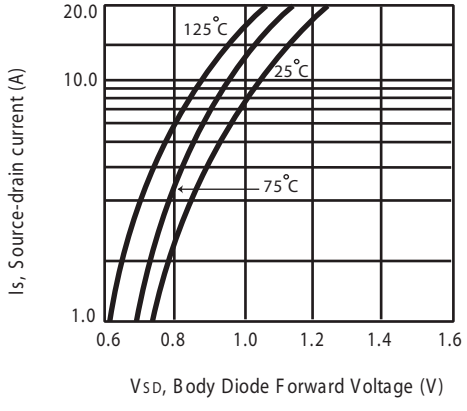


Figure 8. Body Diode Forward Voltage Variation with Source Current

STU402D

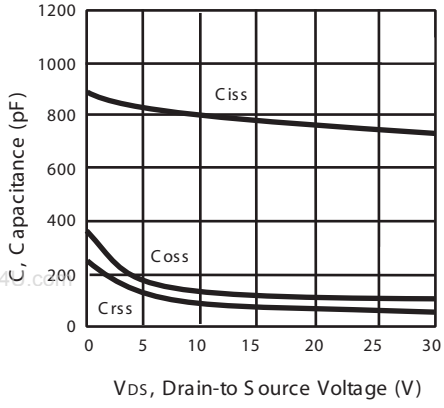
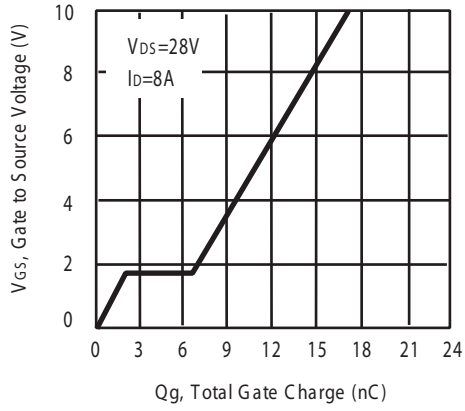


Figure 9. Capacitance



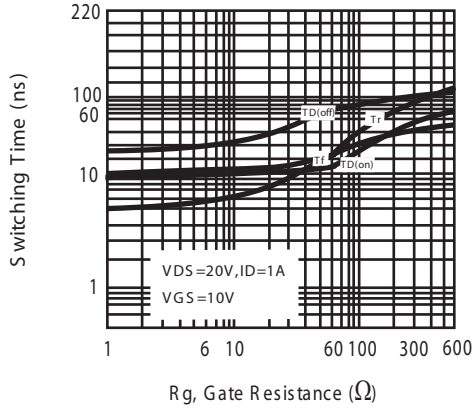


Figure 11.switching characteristics

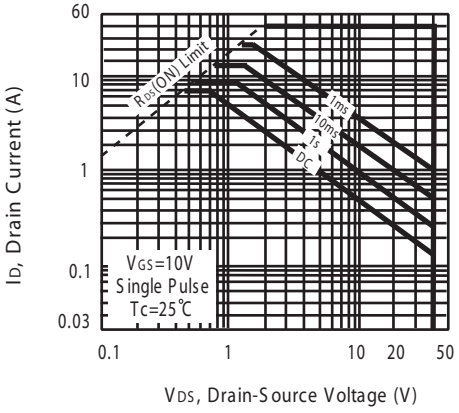


Figure 10. Maximum Safe Operating Area

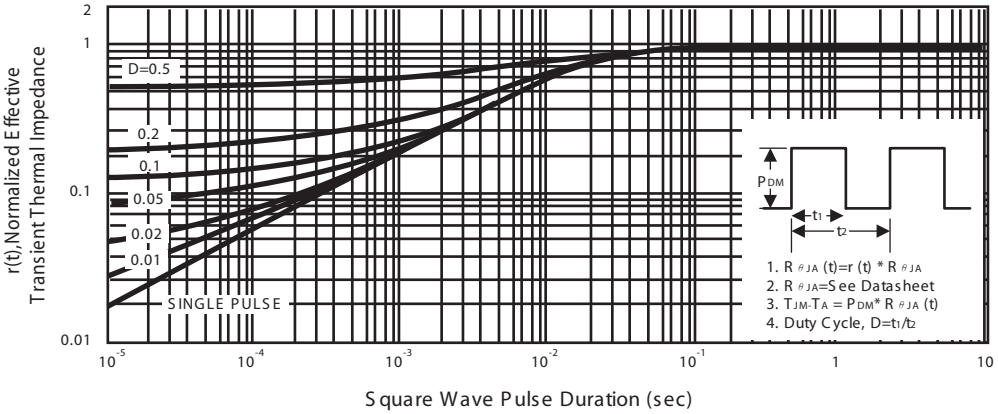
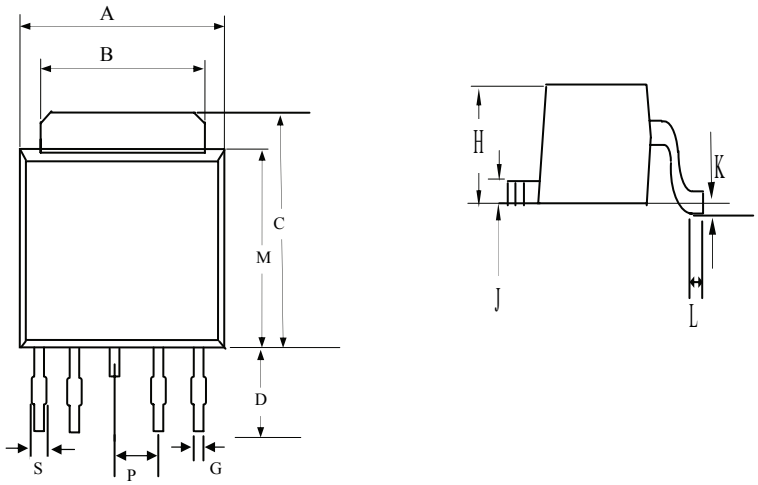


Figure 13. Normalized Thermal Transient Impedance Curve

STU402D

PACKAGE OUTLINE DIMENSIONS

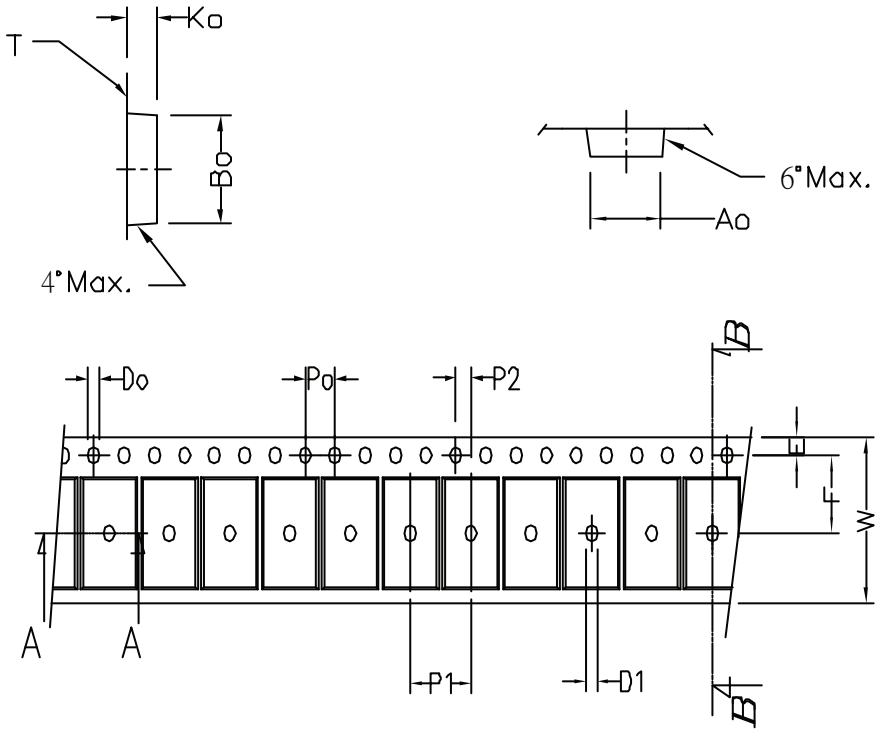
TO-252-4L



REF .	Millimeters	
	MIN	MAX
A	6.40	6.80
B	5.2	5.50
C	6.80	10.20
D	2.20	3.00
P	1.27 REF.	
S	0.50	0.80
G	0.40	0.60
H	2.20	2.40
J	0.45	0.60
K	0	0.15
L	0.90	1.50
M	5.40	5.80

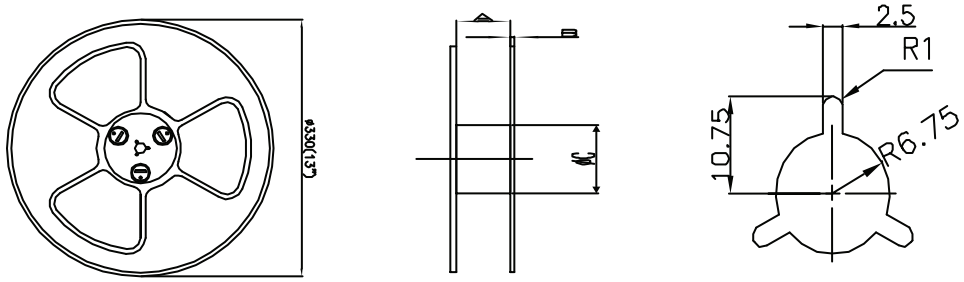
TO-252-4L Tape and Reel Data

TO-252-4L Carrier Tape



symbol	Ao	Bo	Ko	Po	P1	P2	T
Spec	6.96±0.1	10.49±0.1	2.79±0.1	4.0±0.1	8.0±0.10	2.0±0.05	0.33±0.013
symbol	E	F	Do	D1	W	10Po	
Spec	1.75±0.1	7.5±0.05	1.55±0.05	1.5±0.25	$16.0^{+0.3}_{-0.1}$	40.0±0.2	

TO-252-4L Reel



UNIT:㎜

Width of carrier tape	8	12	16	24	32	44	56
A±0.1	9.4	13.4	17.4	25.4	33.4	45.4	57.4
B	2.3	2.3	2.3	2.3	2.3	2.3	2.3
øC	100	100	100	100	100	100	100