SamHop Microelectronics Corp.

STU402D

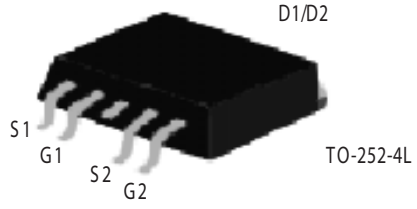
MAY.03 2006

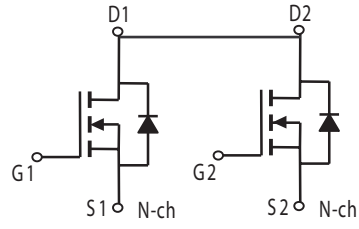
Dual N-Channel Enhancement Mode Field Effect Transistor

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

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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

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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.

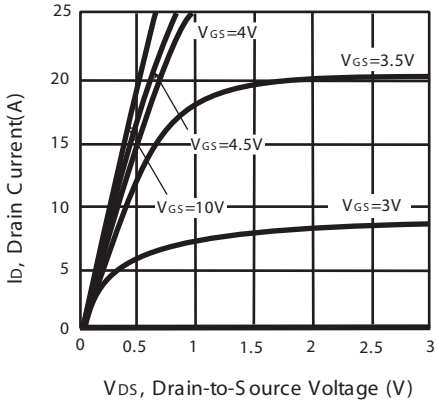

Figure 1. Output Characteristics

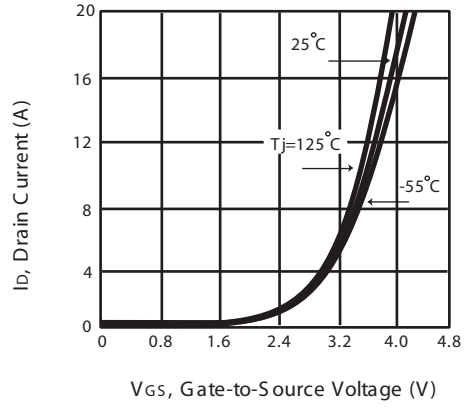

Figure 2. Transfer Characteristics

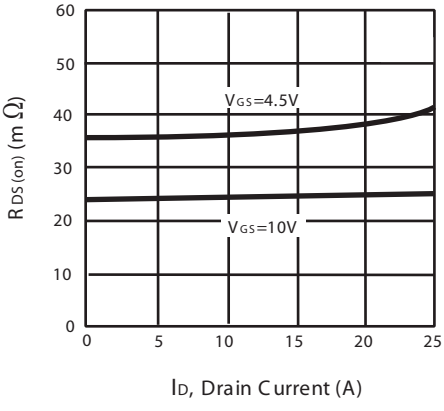

Figure 3. On-Resistance vs. Drain Current and Gate Voltage

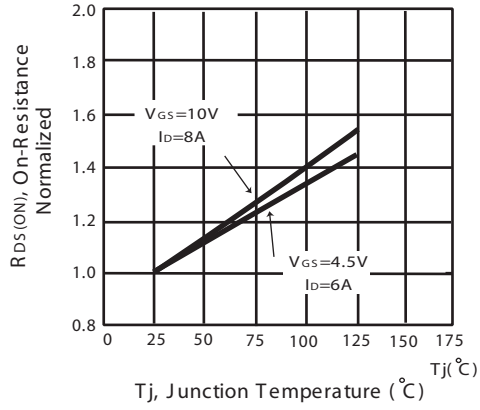

Figure 4. On-Resistance Variation with Drain Current and Temperature

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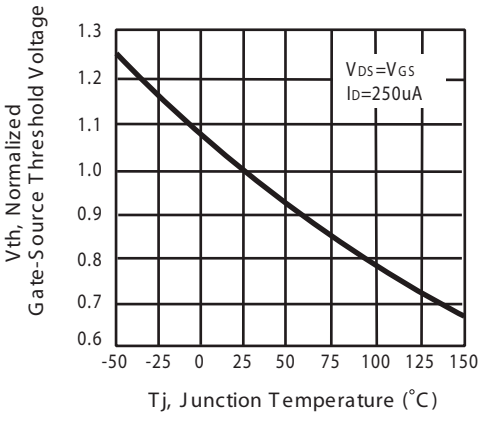

Figure 5. Gate Threshold Variation with Temperature

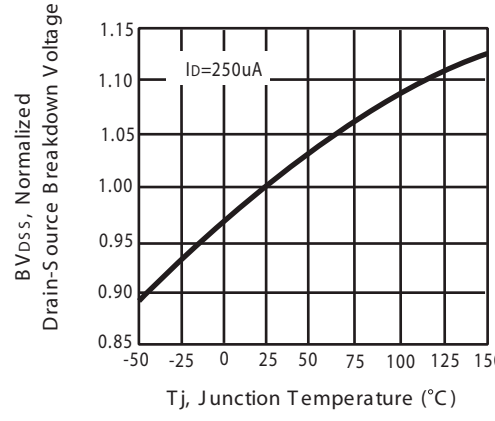

Figure 6. Breakdown Voltage Variation with Temperature

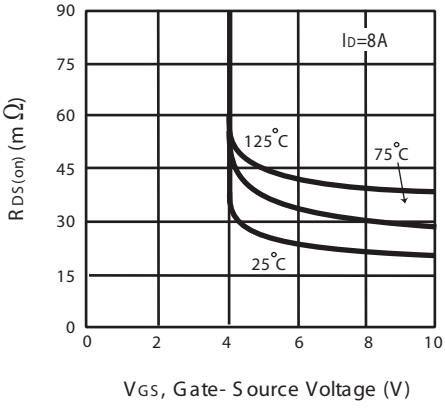

Figure 7. On-Resistance vs. Gate-Source Voltage

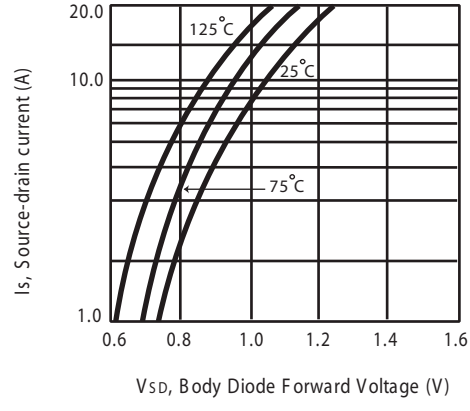

Figure 8. Body Diode Forward Voltage Variation with Source Current

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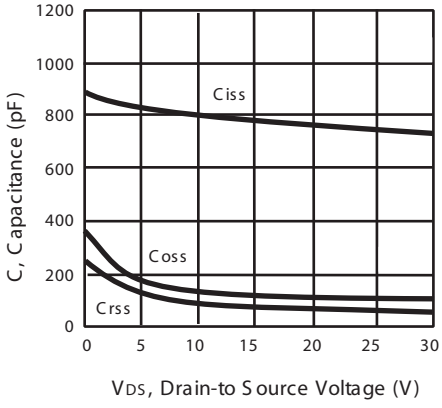
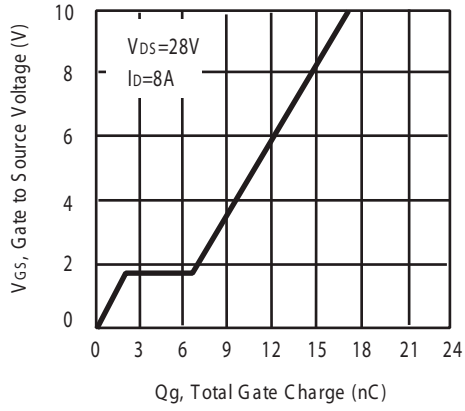


Figure 9. Capacitance



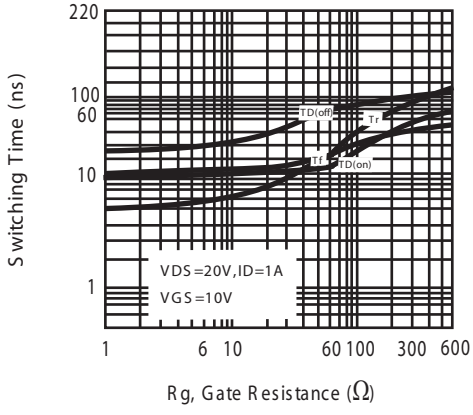


Figure 11.switching characteristics

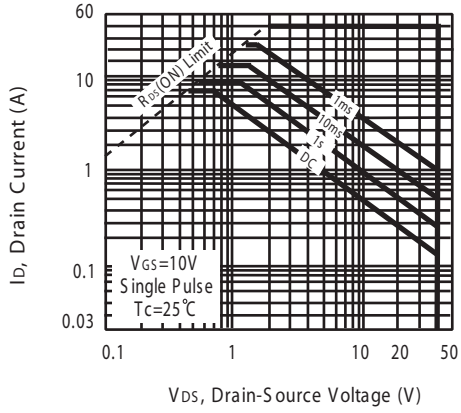


Figure 10. Maximum Safe Operating Area

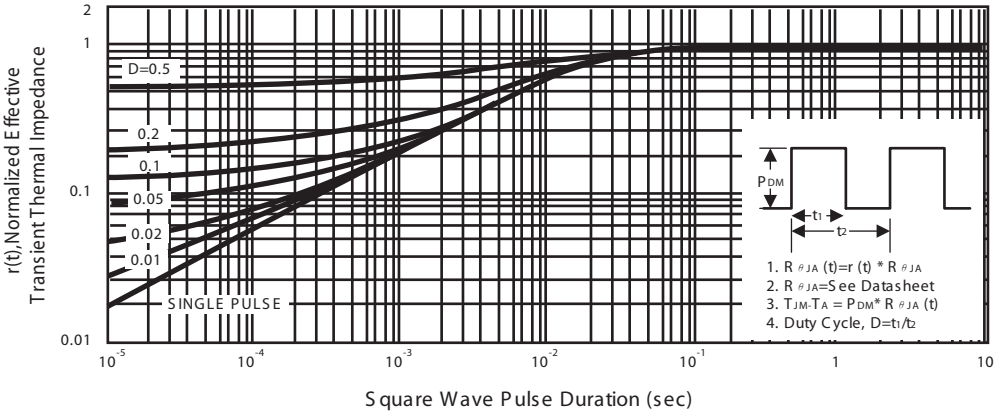


Figure 13. Normalized Thermal Transient Impedance Curve

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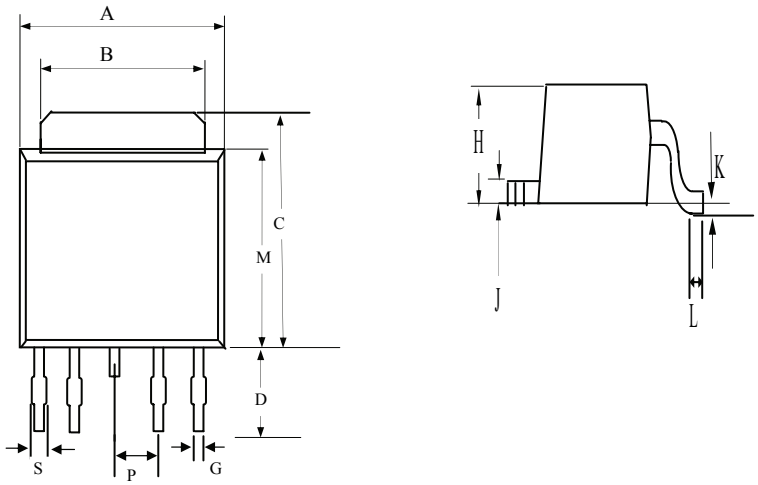
PACKAGE OUTLINE DIMENSIONS

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

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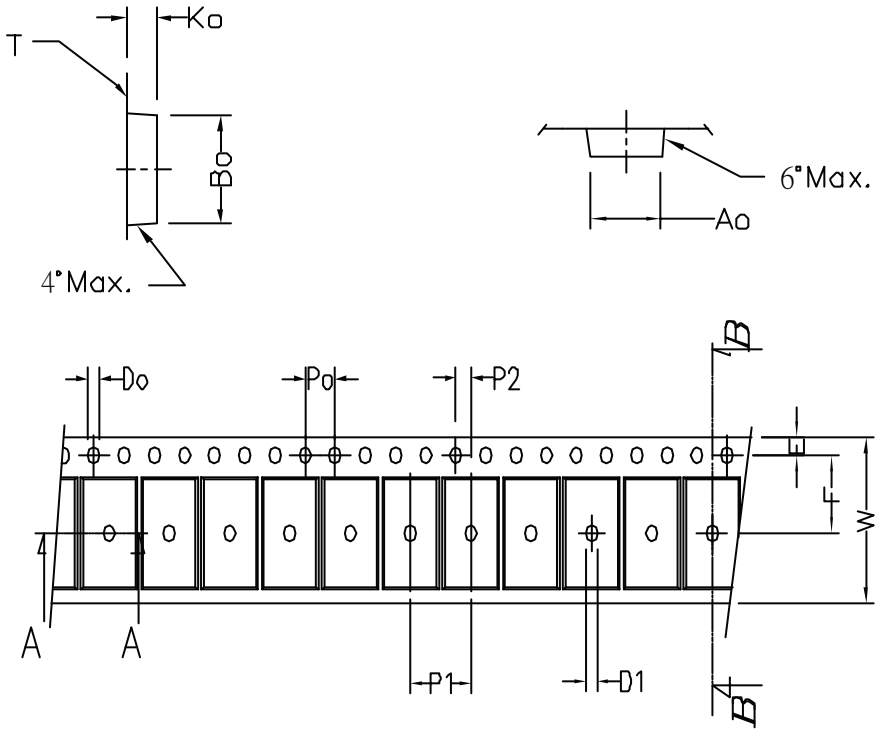
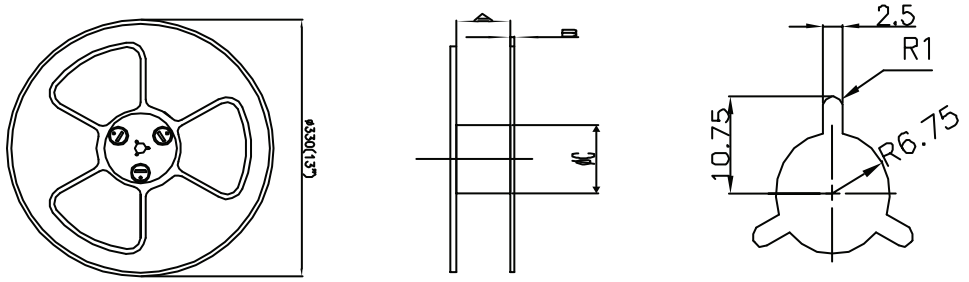
TO-252-4L Tape and Reel Data

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