SamHop Microelectronics Corp.

STU/D434S

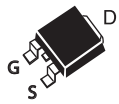
Ver 1.0

N-Channel Logic Level Enhancement Mode Field Effect Transistor

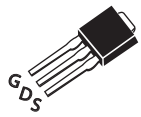
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
40V	50A	9.2 @ VGS=10V
		11.5 @ VGS=4.5V

FEATURES

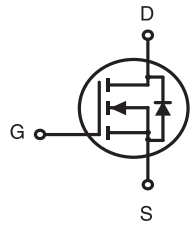
- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- TO-252 and TO-251 Package.



STU SERIES
TO-252AA(D-PAK)



STD SERIES
TO-251(I-PAK)



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

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		40	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Drain Current-Continuous [a]	T_C=25°C	50	A
		T_C=70°C	40	A
I_{DM}	-Pulsed [b]		147	A
E_{AS}	Single Pulse Avalanche Energy [d]		91	mJ
P_D	Maximum Power Dissipation [a]	T_C=25°C	42	W
		T_C=70°C	27	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

$R_{\theta JC}$	Thermal Resistance, Junction-to-Case [a]	3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient [a]	50	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=32V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±20V , V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	1.3	1.7	3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V , I_D=25A		7.6	9.2	m ohm
		V_{GS}=4.5V , I_D=20A		8.8	11.5	m ohm
g_{FS}	Forward Transconductance	V_{DS}=10V , I_D=25A		18		S
DYNAMIC CHARACTERISTICS [c]						
C_{ISS}	Input Capacitance	V_{DS}=20V,V_{GS}=0V f=1.0MHz		1160		pF
C_{OSS}	Output Capacitance			211		pF
C_{RSS}	Reverse Transfer Capacitance			135		pF
SWITCHING CHARACTERISTICS [c]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=20V I_D=1A V_{GS}=10V R_{GEN}=3.3 ohm		17		ns
t_r	Rise Time			24		ns
$t_{D(OFF)}$	Turn-Off Delay Time			59		ns
t_f	Fall Time			11		ns
Q_g	Total Gate Charge	V_{DS}=20V,I_D=25A,V_{GS}=10V		20		nC
		V_{DS}=20V,I_D=25A,V_{GS}=4.5V		10		nC
Q_{gs}	Gate-Source Charge	V_{DS}=20V,I_D=25A, V_{GS}=10V		2.1		nC
Q_{gd}	Gate-Drain Charge			5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I_S	Maximum Continuous Drain-Source Diode Forward Current				10	A
V_{SD}	Diode Forward Voltage [b]	V_{GS}=0V,I_S=10A		0.84	1.3	V

Notes

a.Surface Mounted on FR4 Board,t ≤ 10sec.
b.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.
c.Guaranteed by design, not subject to production testing.
d.Starting T_J=25°C,L=0.5mH,V_{DD} = 20V.(See Figure13)

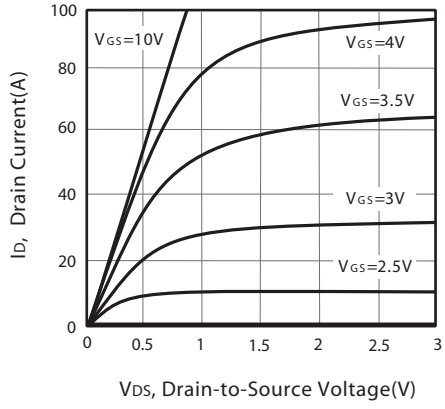


Figure 1. Output Characteristics

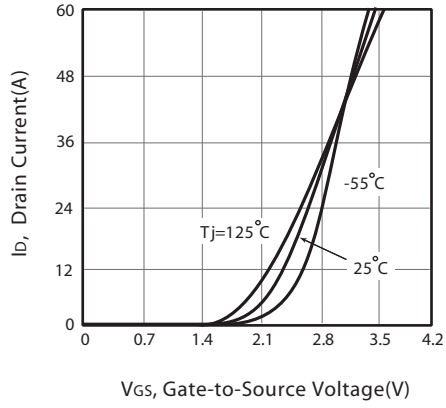


Figure 2. Transfer Characteristics

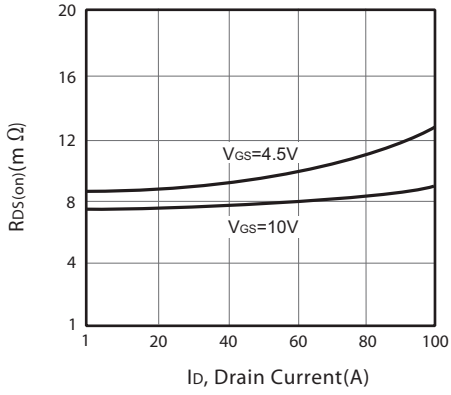


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

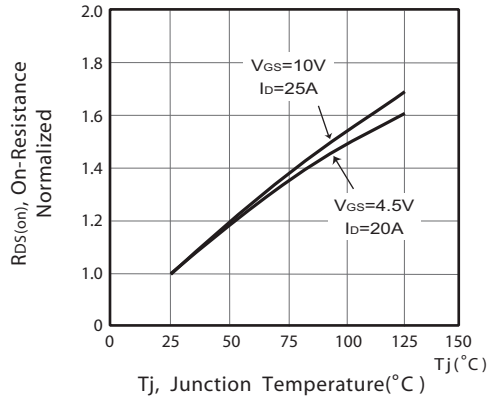


Figure 4. On-Resistance Variation with Drain Current and Temperature

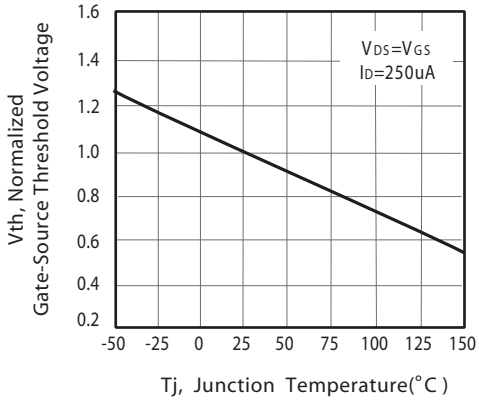


Figure 5. Gate Threshold Variation with Temperature

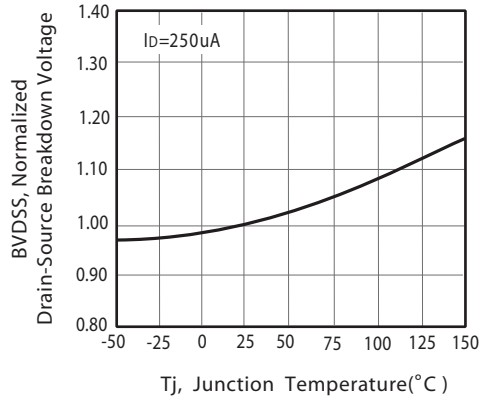


Figure 6. Breakdown Voltage Variation with Temperature

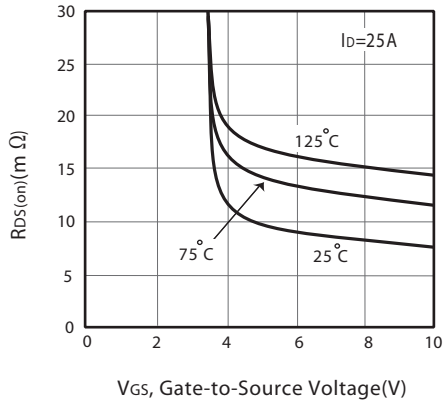


Figure 7. On-Resistance vs. Gate-Source Voltage

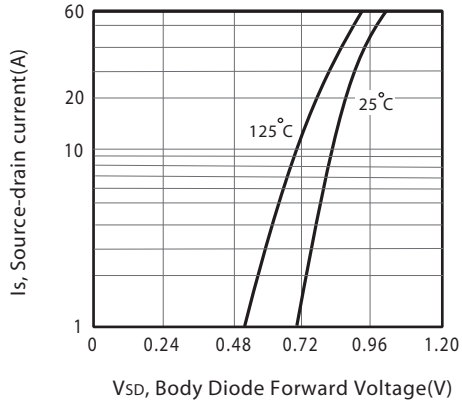


Figure 8. Body Diode Forward Voltage Variation with Source Current

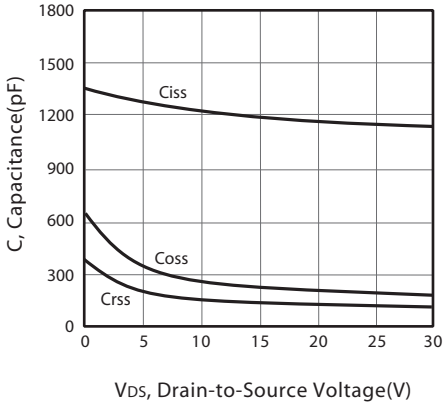


Figure 9. Capacitance

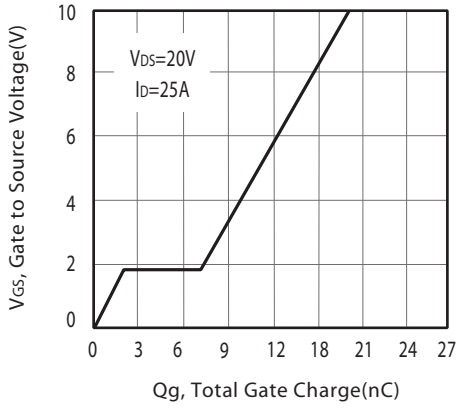


Figure 10. Gate Charge

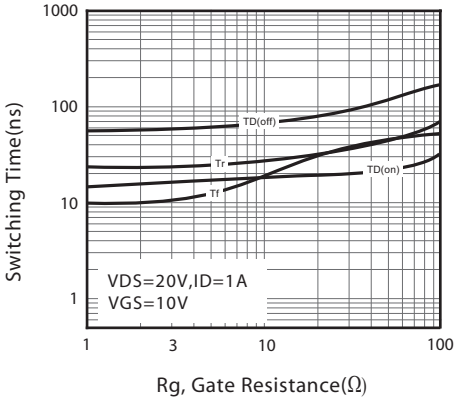


Figure 11. switching characteristics

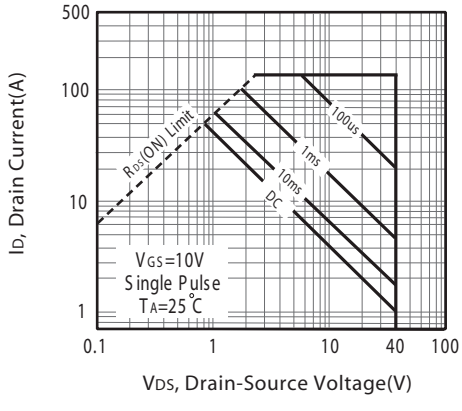
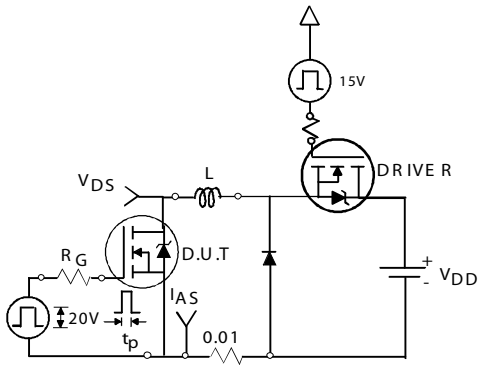
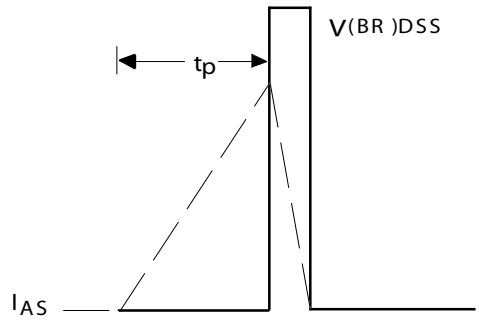


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

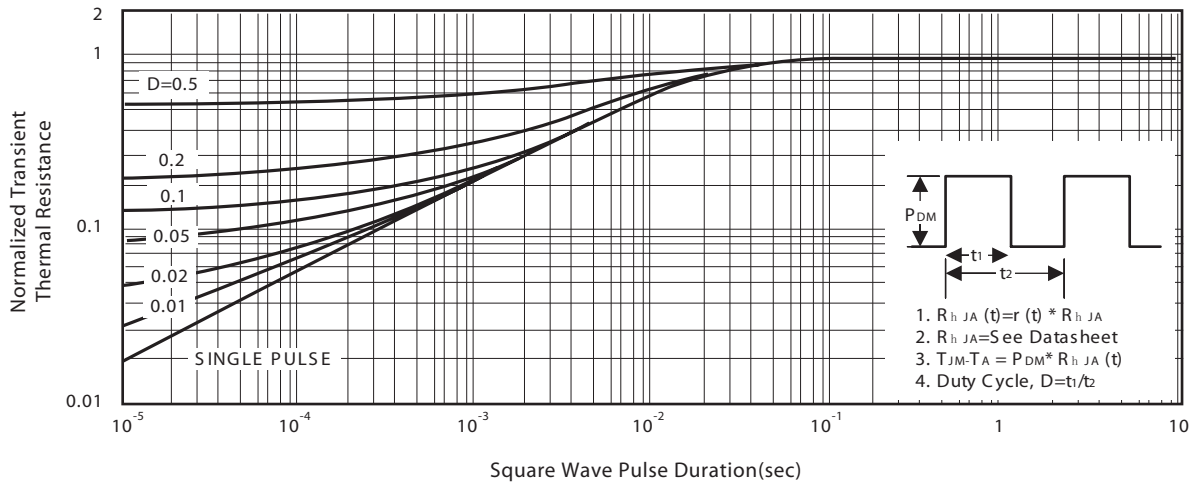
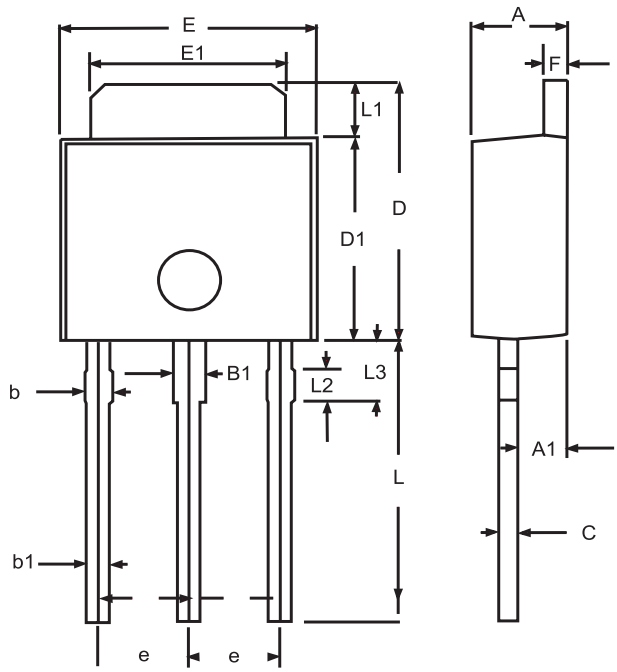


Figure 14. Normalized Thermal Transient Impedance Curve

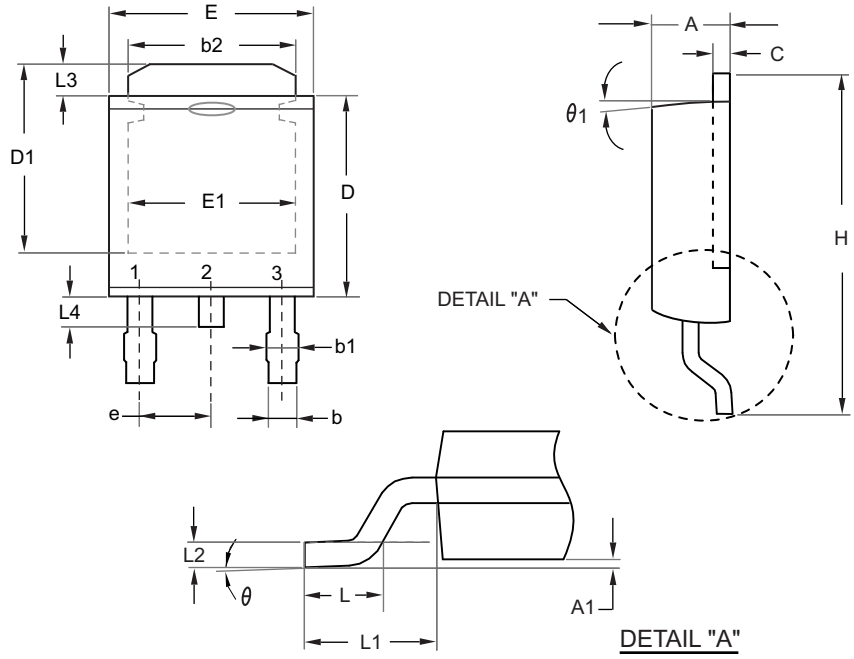
PACKAGE OUTLINE DIMENSIONS

TO-251



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	2.40	0.087	0.095
A1	1.100	1.300	0.043	0.051
B1	0.650	1.050	0.026	0.041
b	0.500	0.900	0.020	0.035
b1	0.400	0.800	0.016	0..32
C	0.400	0.600	0.016	0.024
D	6.700	7.300	0.264	0.287
D1	5.400	5.650	0.213	0.222
E	6.40	6.650	0.252	0.262
e	2.100	2.500	0.083	0.098
F	0.400	0.600	0.016	0.024
L	7.000	8.000	0.276	0.315
L1	1.300	1.700	0.051	0.067
L2	0.700	0.900	0.028	0.035
L3	1.400	1.800	0.055	0.071

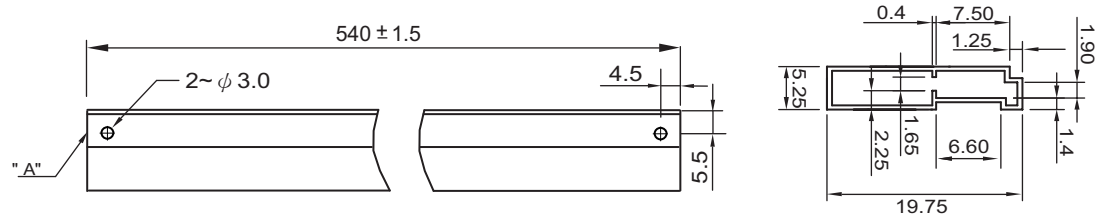
TO-252



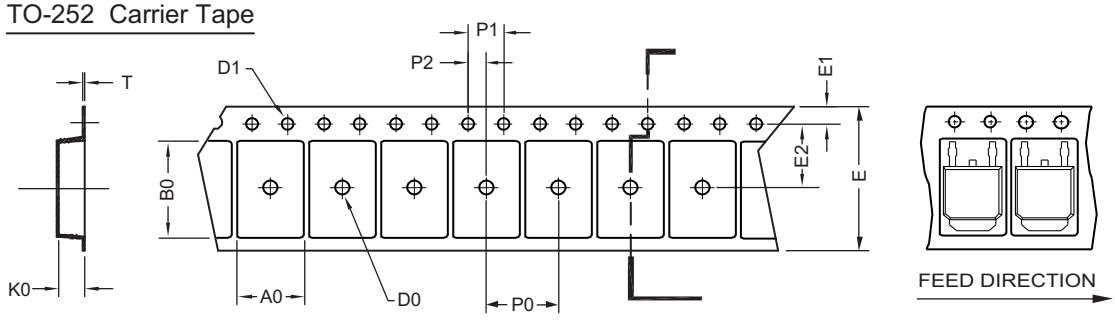
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.184	2.388	0.086	0.094
A1	0.000	0.127	0.000	0.005
b	0.633	0.889	0.025	0.035
b1	0.666	1.092	0.026	0.043
b2	5.207	5.461	0.205	0.215
C	0.460	0.584	0.018	0.023
D	5.969	6.223	0.235	0.245
D1	5.415	5.515	0.213	0.217
E	6.400	6.731	0.252	0.265
E1	4.902	5.004	0.193	0.197
e	2.286	BSC	0.090	BSC
H	9.601	10.286	0.378	0.405
L	1.313	1.651	0.052	0.065
L1	2.666	3.174	0.105	0.125
L2	0.460	0.560	0.018	0.022
L3	0.889	1.143	0.035	0.045
L4	0.508	1.016	0.020	0.040
θ	0°	8°	0°	8°
θ1	7°	REF.	7°	REF.

TO-251 Tube/TO-252 Tape and Reel Data

TO-251 Tube



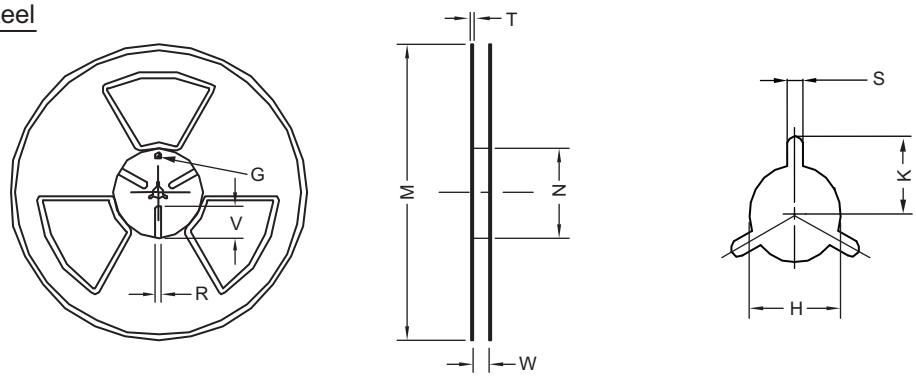
TO-252 Carrier Tape



UNIT:㎜

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
TO-252 (16 ㎜)	6.96 ±0.1	10.49 ±0.1	2.79 ±0.1	φ2	φ1.5 + 0.1 - 0	16.0 ±0.3	1.75 ±0.1	7.5 ±0.15	8.0 ±0.1	4.0 ±0.1	2.0 ±0.15	0.3 ±0.05

TO-252 Reel



UNIT:㎜

TAPE SIZE	REEL SIZE	M	N	W	T	H	K	S	G	R	V
16 ㎜	φ 330	φ330 ± 0.5	φ97 ± 1.0	17.0 + 1.5 - 0	2.2	φ13.0 + 0.5 - 0.2	10.6	2.0 ±0.5	---	---	---