SamHop Microelectronics Corp.

STU/D1530PL

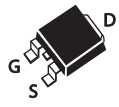
Preliminary Mar.28 2004

P-Channel Enhancement Mode MOSFET

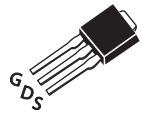
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
-30V	-20A	45 @ V_{GS} = -10V
		60 @ V_{GS} = -4.5V

FEATURES

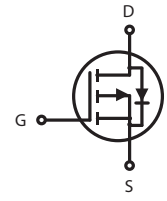
- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- TO-252 and TO-251 Package.



SDU SERIES
TO-252AA(D-PAK)



SDD SERIES
TO-251(I-PAK)



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous [a] @ T_J=125°C	I_D	-20	A
-Pulsed [b]	I_{DM}	-50	A
Drain-Source Diode Forward Current [a]	I_S	-20	A
Maximum Power Dissipation [a]	P_D	50	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	°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	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V, 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	-1.5	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-5.8A		35	45	m-ohm
		V_{GS}=-4.5V, I_D=-2.0A		50	60	m-ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}=-5V, V_{GS}=-10V	-20			A
Forward Transconductance	g_{FS}	V_{DS}=-15V, I_D=-5.8A		8		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=-15V, V_{GS}=0V f=1.0MHz		809		pF
Output Capacitance	C_{OSS}			174		pF
Reverse Transfer Capacitance	C_{RSS}			101		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_D=-15V, I_D=-1A, V_{GEN}=-10V, R_{GEN}=6 ohm R_L=15 ohm		12.3		ns
Rise Time	t_r			18.6		ns
Turn-Off Delay Time	$t_{D(OFF)}$			69.4		ns
Fall Time	t_f			44		ns
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-5.3A,V_{GS}=-10V		18.8		nC
		V_{DS}=-15V,I_D=-5.3A,V_{GS}=-4.5V		9.5		nC
Gate-Source Charge	Q_{gs}	V_{DS}=-15V, I_D=-5.3A, V_{GS}=-10V		3.9		nC
Gate-Drain Charge	Q_{gd}			3.2		nC

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

Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is =-15A		-1	-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.

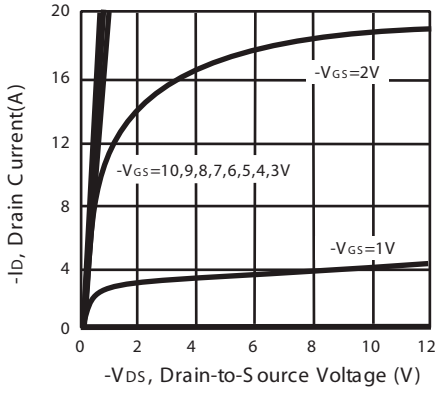


Figure 1. Output Characteristics

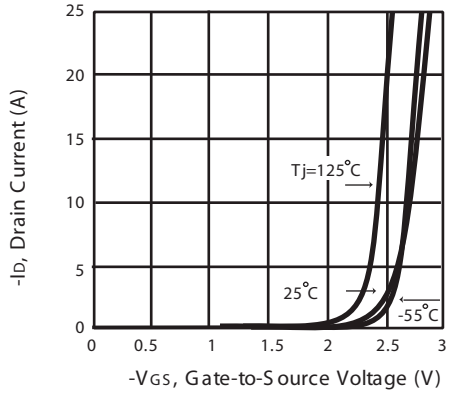


Figure 2. Transfer Characteristics

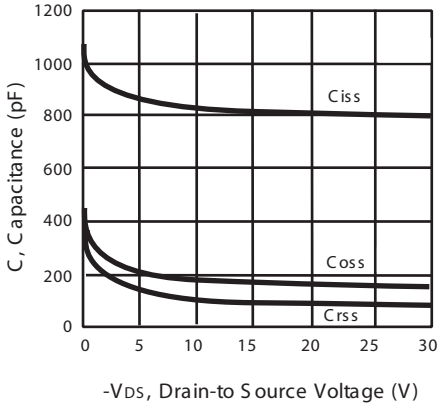


Figure 3. Capacitance

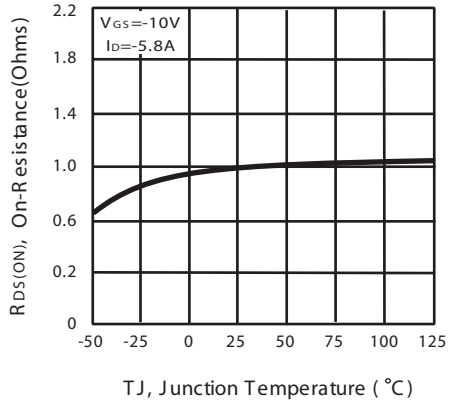


Figure 4. On-Resistance Variation with Temperature

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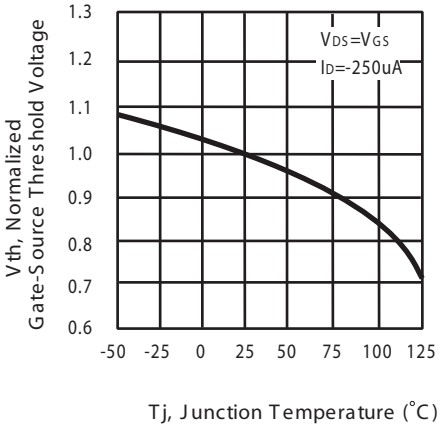


Figure 5. Gate Threshold Variation with Temperature

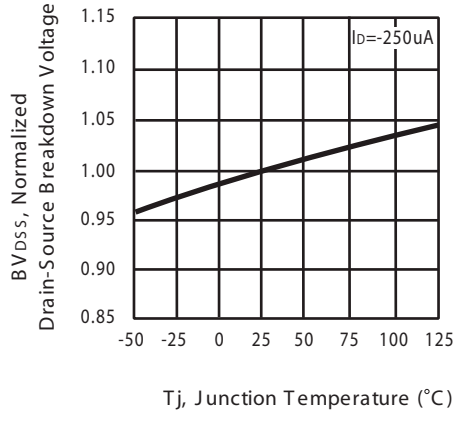


Figure 6. Breakdown Voltage Variation with Temperature

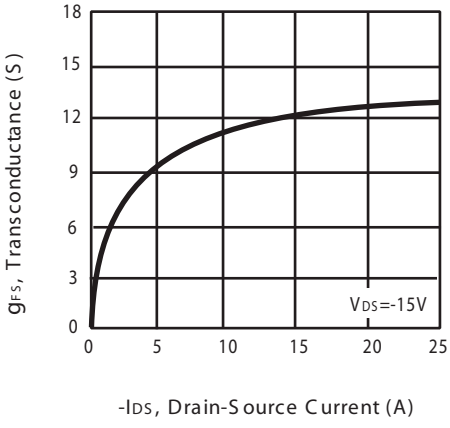


Figure 7. Transconductance Variation with Drain Current

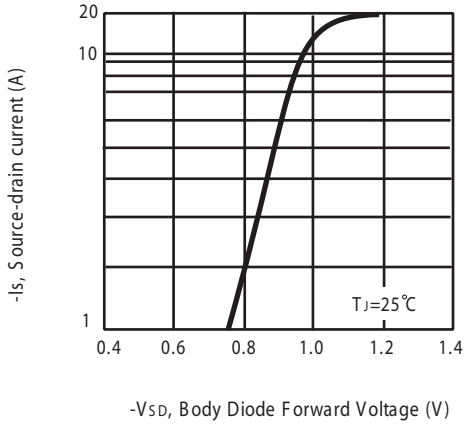


Figure 8. Body Diode Forward Voltage Variation with Source Current

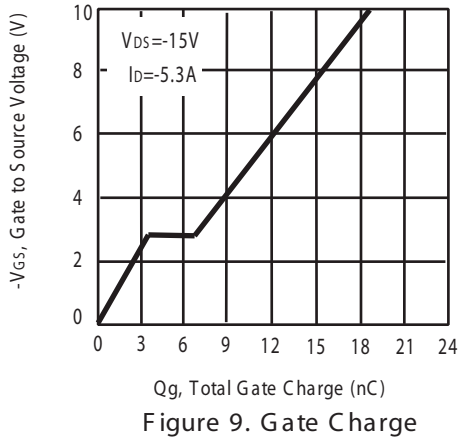


Figure 9. Gate Charge

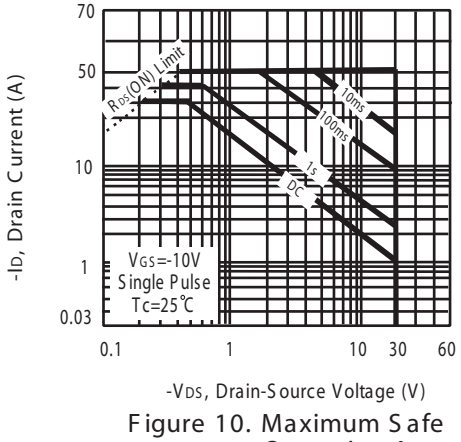


Figure 10. Maximum Safe Operating Area

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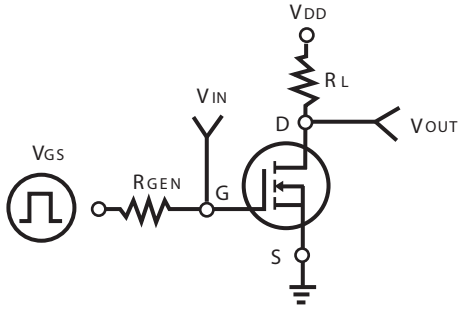


Figure 11. Switching Test Circuit

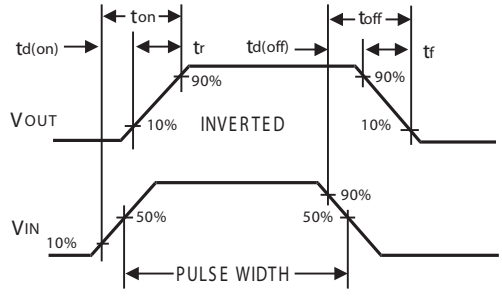


Figure 12. Switching Waveforms

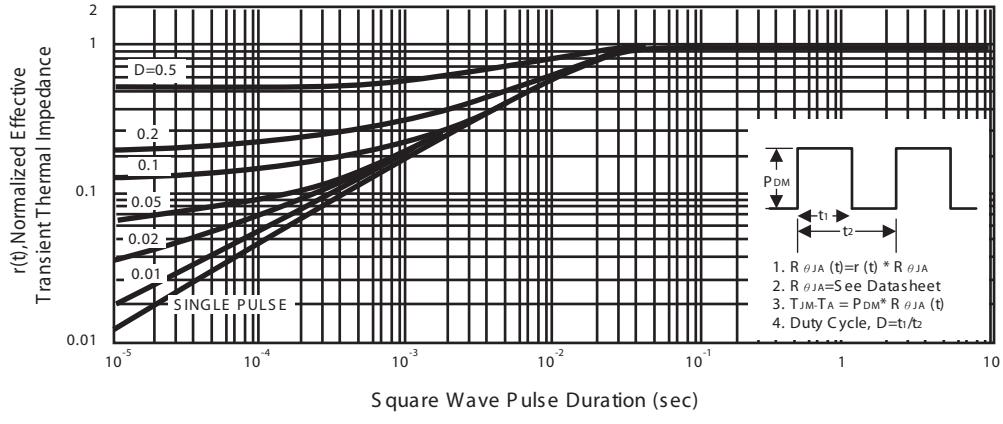
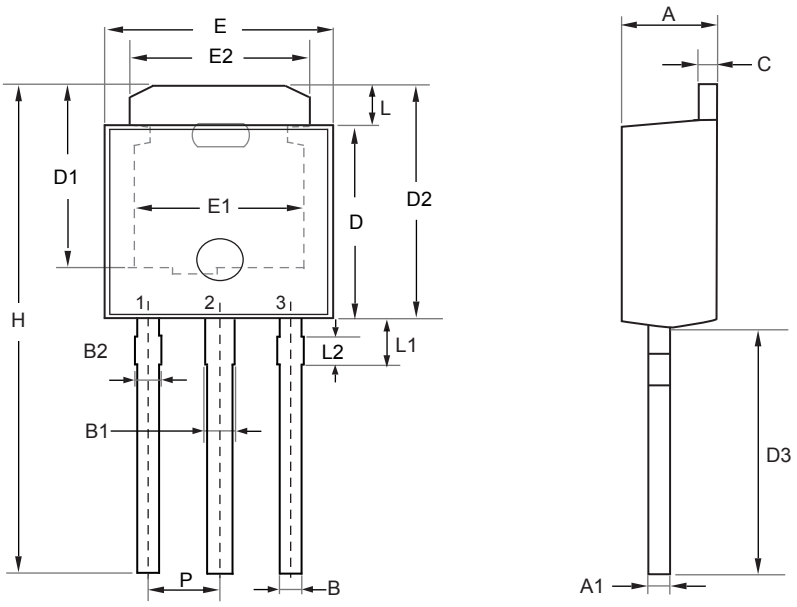


Figure 13. Normalized Thermal Transient Impedance Curve

PACKAGE OUTLINE DIMENSIONS

TO-251

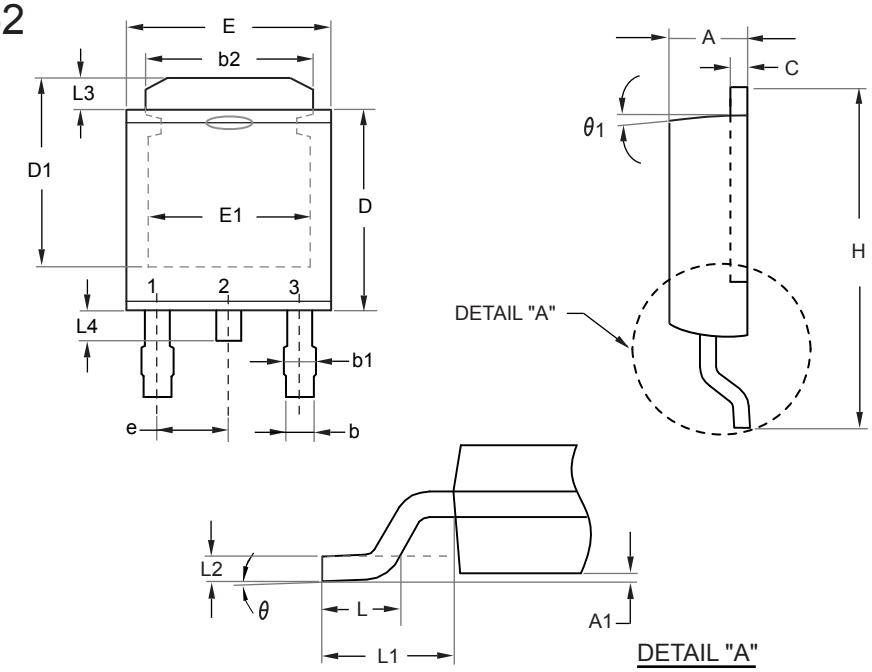


SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.100	2.500	0.083	0.098
A1	0.350	0.650	0.014	0.026
B	0.400	0.800	0.016	0.031
B1	0.650	1.050	0.026	0.041
B2	0.500	0.900	0.020	0.035
C	0.400	0.600	0.016	0.024
D	5.300	5.700	0.209	0.224
D1	4.900	5.300	0.193	0.209
D2	6.700	7.300	0.264	0.287
D3	7.000	8.000	0.276	0.315
H	13.700	15.300	0.539	0.602
E	6.300	6.700	0.248	0.264
E1	4.600	4.900	0.181	0.193
E2	4.800	5.200	0.189	0.205
L	1.300	1.700	0.051	0.067
L1	1.400	1.800	0.055	0.071
L2	0.500	0.900	0.020	0.035
P	2.300 BSC		0.091 BSC	

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PACKAGE OUTLINE DIMENSIONS

TO-252

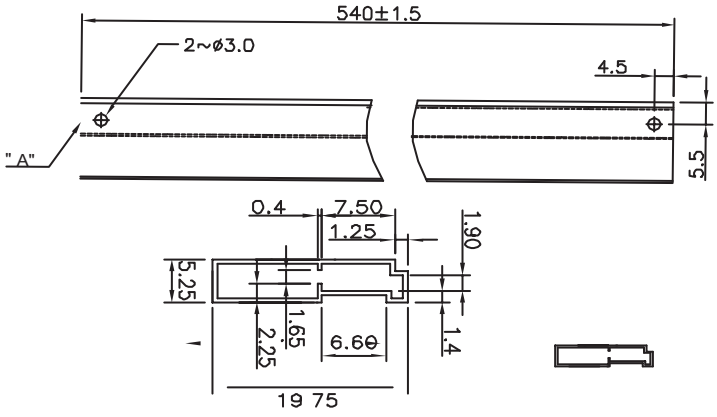


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.100	2.500	0.083	0.098
A1	0.000	0.200	0.000	0.008
b	0.400	0.889	0.016	0.035
b1	0.770	1.140	0.030	0.045
b2	4.800	5.460	0.189	0.215
C	0.400	0.600	0.016	0.024
D	5.300	6.223	0.209	0.245
D1	4.900	5.515	0.193	0.217
E	6.300	6.731	0.248	0.265
E1	4.400	5.004	0.173	0.197
e	2.290 REF		0.090 BSC	
H	8.900	10.400	0.350	0.409
L	1.397	1.770	0.055	0.070
L1	2.743 REF.		0.108 REF.	
L2	0.508 REF.		0.020 REF.	
L3	0.890	1.700	0.035	0.067
L4	0.500	1.100	0.020	0.043
θ	0°	10°	0°	10°
θ1	7° REF.		7° REF.	

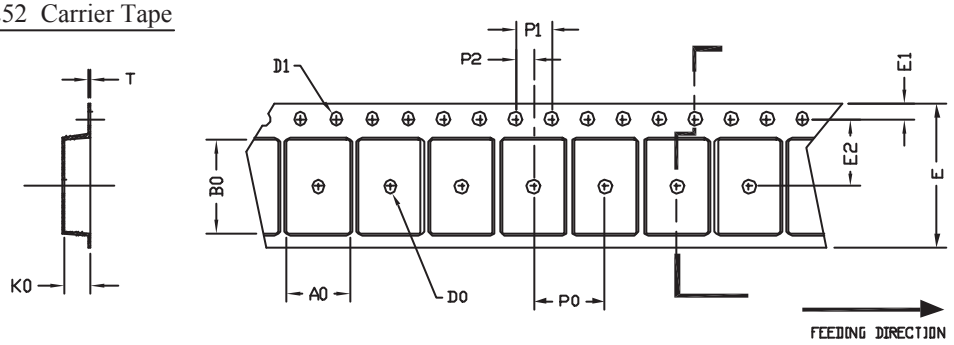
STU/D1530PL

TO251 Tube/TO-252 Tape and Reel Data

TO-251 Tube



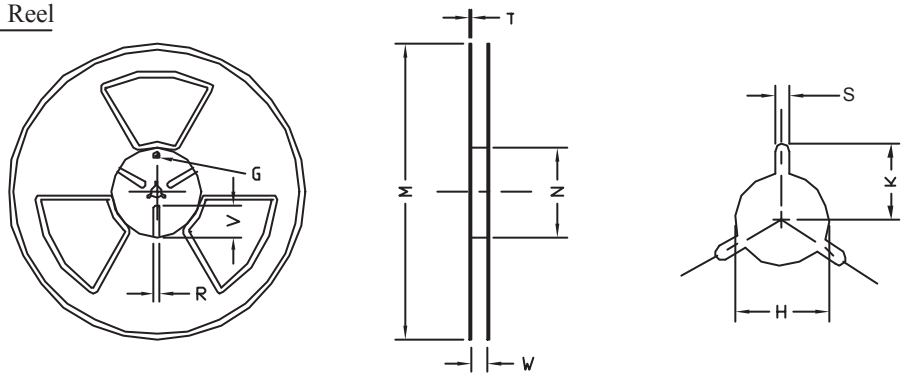
TO-252 Carrier Tape



UNIT:㎜

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
TO-252 (16 ㎜)	6.80 ±0.1	10.3 ±0.1	2.50 ±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	---	---	---