SamHop Microelectronics Corp.

SDU/D01N60A

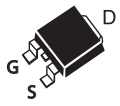
Preliminary

600V N-Channel Planar MOSFET

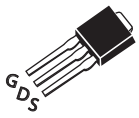
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
600V	1.1A	9.3 @ VGS=10V,ID=0.55A

FEATURES

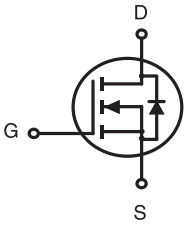
- Low Crss (typical 2pF).
- Fast Switching.
- 100% Avalanche Rated.



STU SERIES
TO - 252(D-PAK)



STD SERIES
TO - 251(I-PAK)



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

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		600	V
V_{GS}	Gate-Source Voltage		±30	V
I_D	Continuous Drain Curren	T_C=25°C	1.1	A
		T_C=100°C	0.7	A
I_{DM}	Pulsed Drain Current, V_{GS}=10V [a]		4.4	A
E_{AS}	Single Pulse Avalanche Energy [b]		36	mJ
dv/dt	Peak Diode Recovery Energy [c]		4.5	V/ns
P_D	Power Dissipation	T_C=25°C	26	W
	Linear Derating Factor	T_C>25°C	10.4	W/°C
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	4.8	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	600			V
$\triangle V_{(BR)DSS}$ /$\triangle T_J$	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I_D=250uA		0.6		V/°C
I_{DSS}	Drain-to-Source Leakage Current	V_{DS}=600V , V_{GS}=0V			20	uA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{DS}=0V , V_{GS}=30V			100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{DS}=0V , V_{GS}=-30V			-100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	2.0		4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=0.55A [d]			9.3	ohm
g_{FS}	Forward Transconductance	V_{DS}=15V , I_D=0.55A [d]			10	S
DYNAMIC CHARACTERISTICS						
C_{ISS}	Input Capacitance	V_{DS}=25V,V_{GS}=0V f=1.0MHz		169		pF
C_{OSS}	Output Capacitance			25		pF
C_{RSS}	Reverse Transfer Capacitance			2		pF
SWITCHING CHARACTERISTICS						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=300V I_D=1.1A R_G=10 ohm,R_D=300 ohm V_{GS}=10V [d]		9.1		ns
t_r	Turn-On Rise Time			27		ns
$t_{D(OFF)}$	Turn-Off Delay Time			17		ns
t_f	Turn-Off Fall Time			35		ns
Q_g	Total Gate Charge	V_{DS}=300V,I_D=1.1A, V_{GS}=10V [d]		6.2		nC
Q_{gs}	Gate-Source Charge			0.9		nC
Q_{gd}	Gate-Drain("Miller") Charge			3.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I_S	Maximum Continuous Source Current(Body Diode)				1.1	A
I_{SM}	Maximum Pulsed Source Current(Body Diode)				4.4	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V,I_S=0.55A [d]			1.5	V

Notes :

a. Repetitive Rating：Pulse width limited by maximum junction temperature.
b. VDD=50V, starting T_J=25°C,L=72mH, R_G=25Ω, I_{AS}=1A
c. I_{SD} ≤ 1A, di/dt ≤ 100A/us, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C
d. Pulse Test：Pulse width ≤ 300us, Duty cycle ≤ 2%.

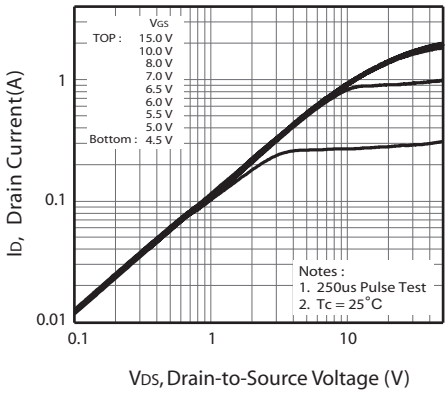


Figure 1. Output Characteristics

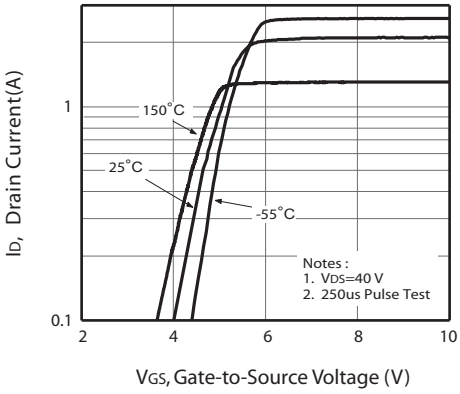


Figure 2. Transfer Characteristics

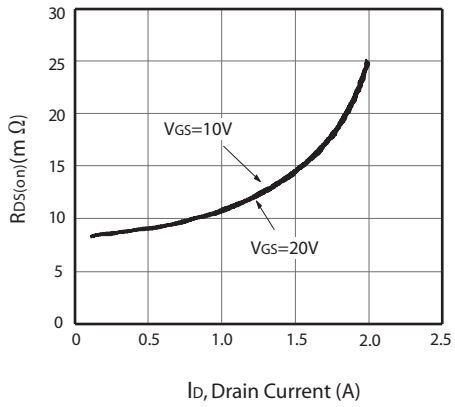


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

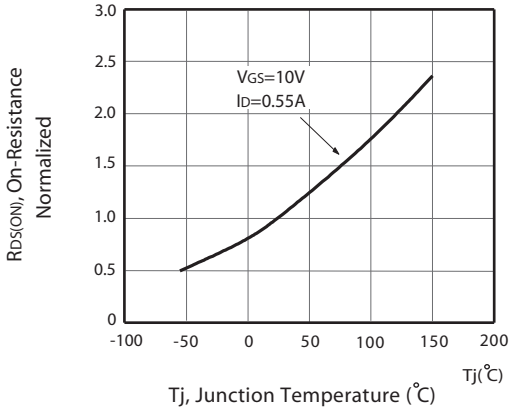


Figure 4. On-Resistance Variation with Drain Current and Temperature

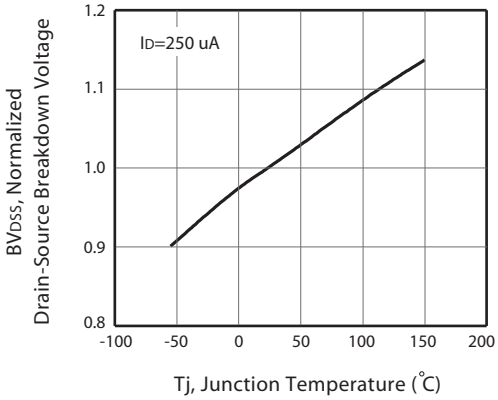


Figure 5. Breakdown Voltage Variation with Temperature

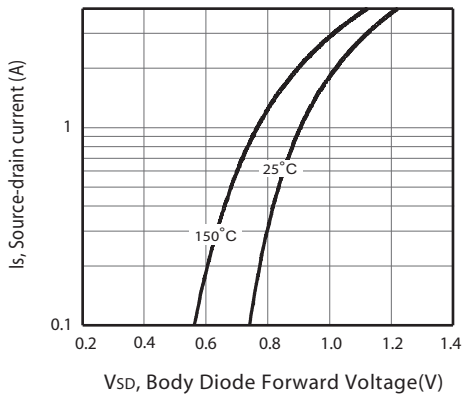


Figure 6. Body Diode Forward Voltage Variation with Source Current

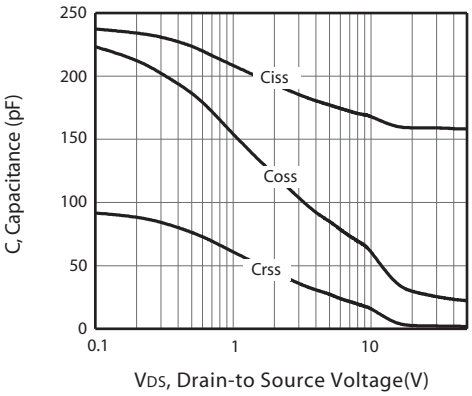


Figure 7. Capacitance

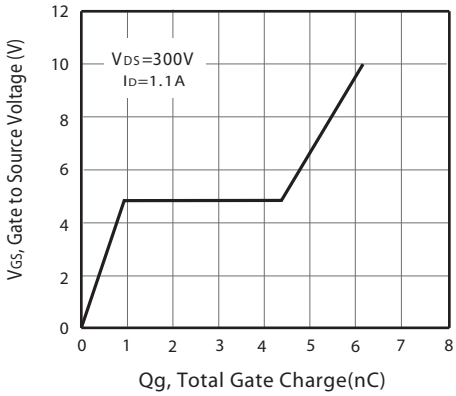


Figure 8. Gate Charge

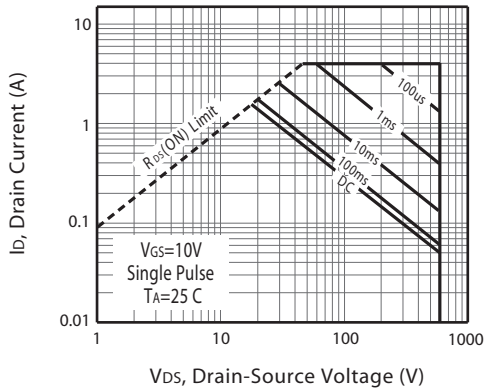
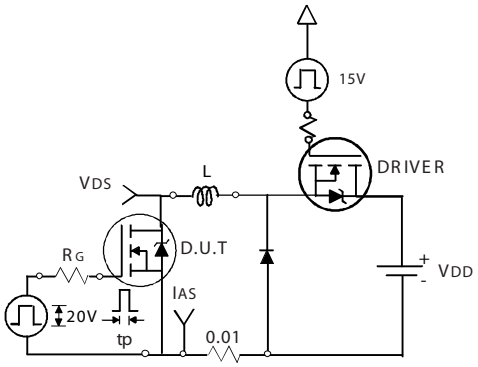
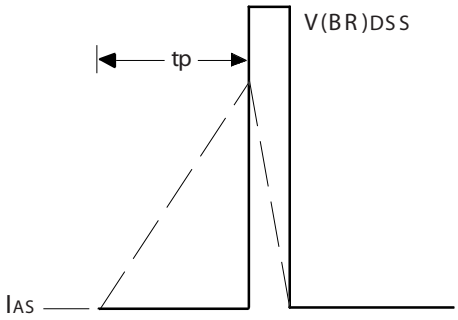


Figure 9. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 10a.



Unclamped Inductive Waveforms

Figure 10b.

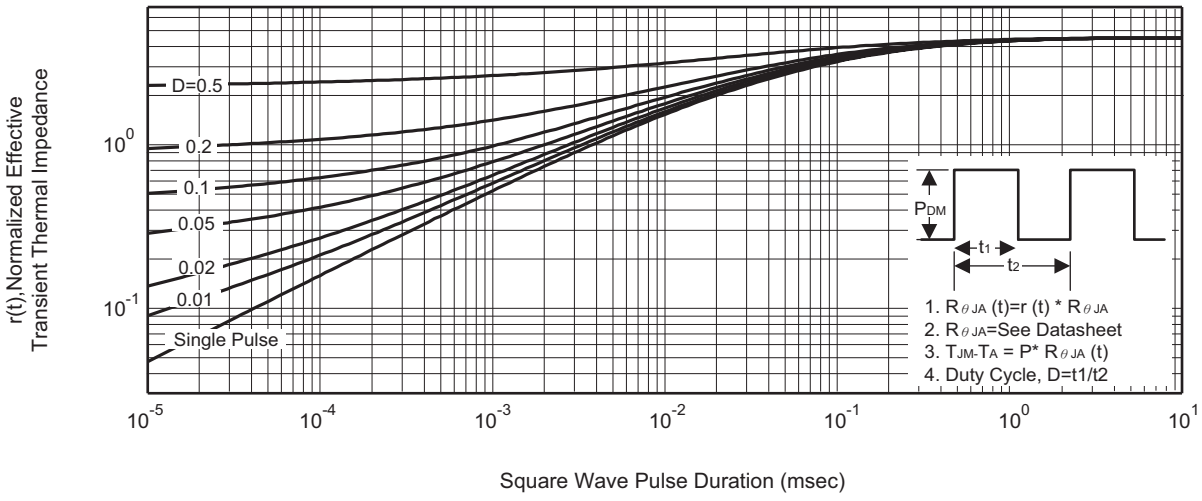
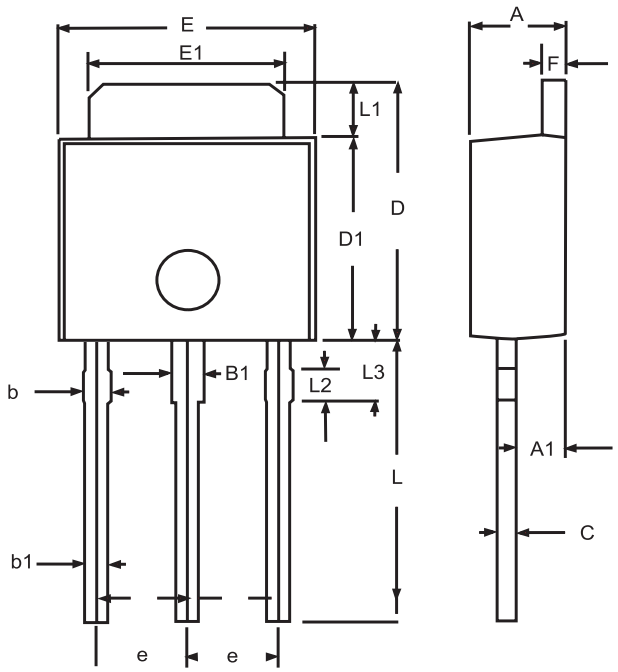


Figure 11. Normalized Thermal Transient Impedance Curve

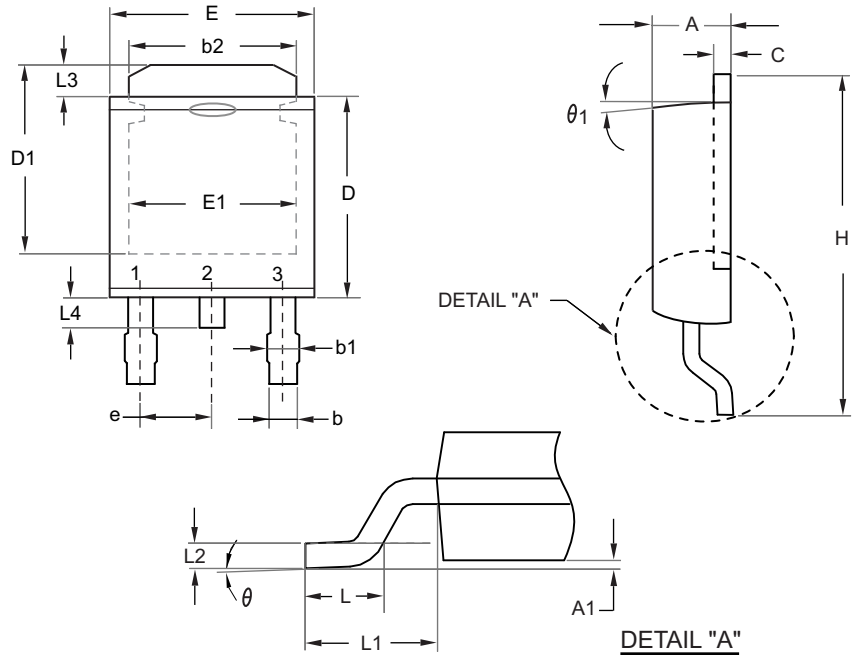
PACKAGE OUTLINE DIMENSIONS

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

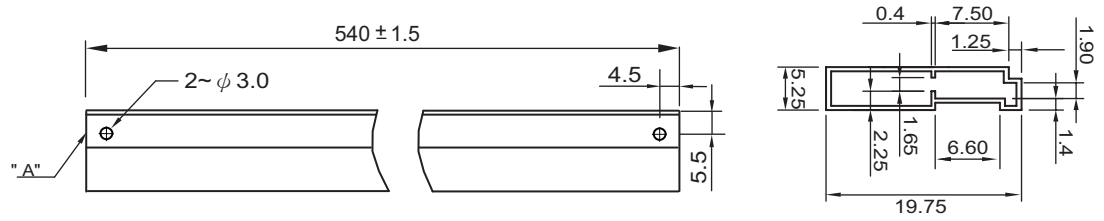


DETAIL "A"

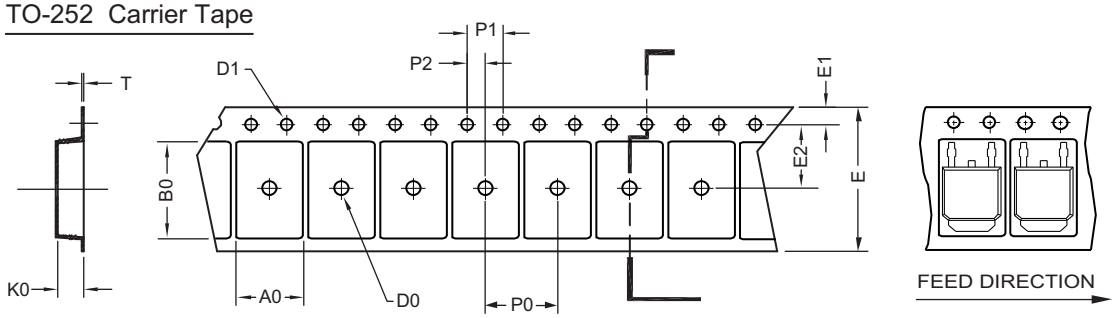
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.184	2.388	0.086	0.094
A1	0.000	0.127	0.000	0.005
b	0.633	0.889	0.025	0.035
b1	0.666	1.092	0.026	0.043
b2	5.207	5.461	0.205	0.215
C	0.460	0.584	0.018	0.023
D	5.969	6.223	0.235	0.245
D1	5.415	5.515	0.213	0.217
E	6.400	6.731	0.252	0.265
E1	4.902	5.004	0.193	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



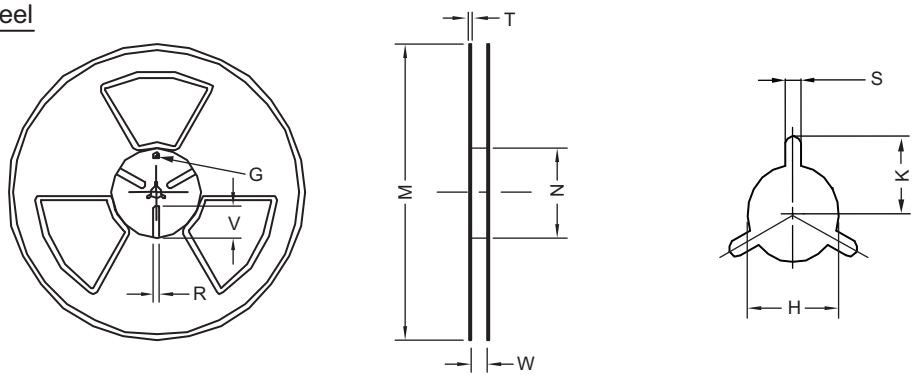
TO-252 Carrier Tape



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	---	---	---