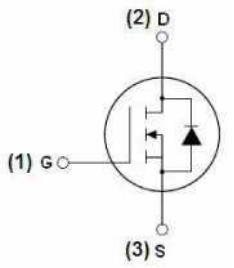
UDU Semiconductor

MTD3055V

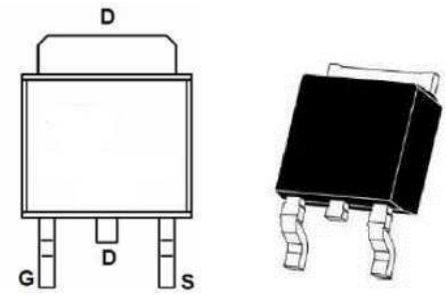
60V（V_{DS}）/ 25A（I_D）N-Channel Enhancement-Mode MOSFET



Schematic diagram

General Features

- V_{DS}=60V , I_D=25A $R_{DS(ON)}$ <32mΩ @ V_{GS}=10V
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation



TO-252

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous		I_D	25	A
	T_C =100℃		14	
Drain Current –Pulsed[a]		I_{DM}	60	A
Power Dissipation		P_D	45	W
Derating factor			0.3	W/ ℃
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 175	℃
Single pulse avalanche energy (Note 5)		EAS	72	mJ
Thermal Resistance, Junction-to-Ambient1(Note2)		RθJA	3.3	℃/W

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

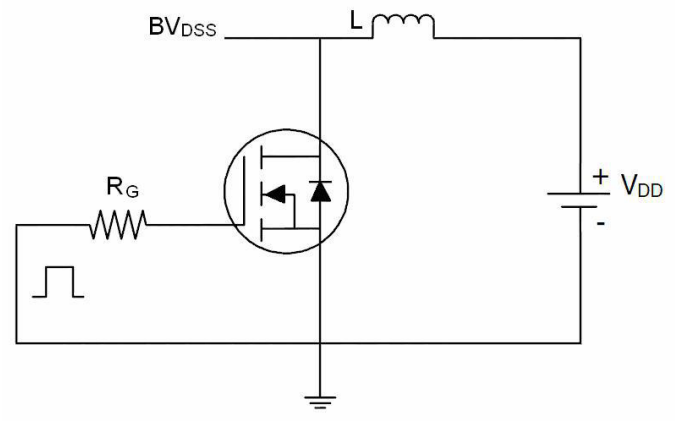
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	60	—	—	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	—	—	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS}=0V	—	—	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D =250μA	1.2	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =4.5 A	—	27	32	mΩ
Forward Transconductance	g_{fs}	V_{DS}=5V, I_D =5A	11	—	—	S
Diode Forward Voltage (Note3)	V_{SD}	V_{GS}=0V,I_S=20A	—	—	1.2	V
Continuous Source Current (Note2)	I_S		—	—	20	A
Reverse Recovery Time	trr	T_J = 25°C, IF =20A di/dt = 100A/μs(Note3)	—	35	—	nS
Reverse Recovery Charge	Qrr		—	53	—	nC
Input Capacitance	C_{iss}	V_{GS}=0V,V_{DS}=30V, f=1.0MHz	—	1500	—	pF
Output Capacitance	C_{oss}		—	60	—	
Reverse Transfer Capacitance	C_{rss}		—	25	—	
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=30V, I_D=4.5A	—	47	—	nC
Gate-Source Charge	Q_{gs}		—	6	—	
Gate-Drain Charge	Q_{gd}		—	14	—	
Turn-on Delay Time	$td_{(on)}$	V_{DD}=30V, R_L=6.7Ω R_G=3Ω, V_{GS}=10V	—	5	—	ns
Turn-on Rise Time	t_r		—	2.6	—	
Turn-off Delay Time	$t_{d(off)}$		—	16.1	—	
Turn-off Fall Time	t_f		—	2.3	—	
Forward Turn-On Time	ton	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

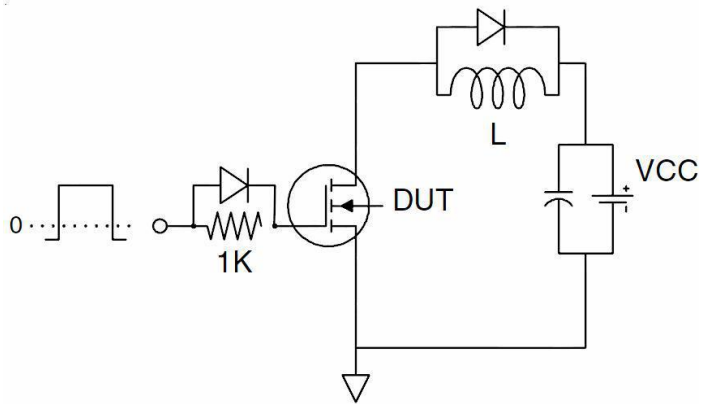
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width ≤ 300μ ≤ 10 sec .
3. Surface Mounted on FR4 Board,s,t Duty Cycle ≤ 2%.
4.Guaranteed by design, not subject to production
5. EAS condition:Tj=25 ,VDD=30V,VG=10V,L=0.5mH,Rg=25Ω

Test Circuit

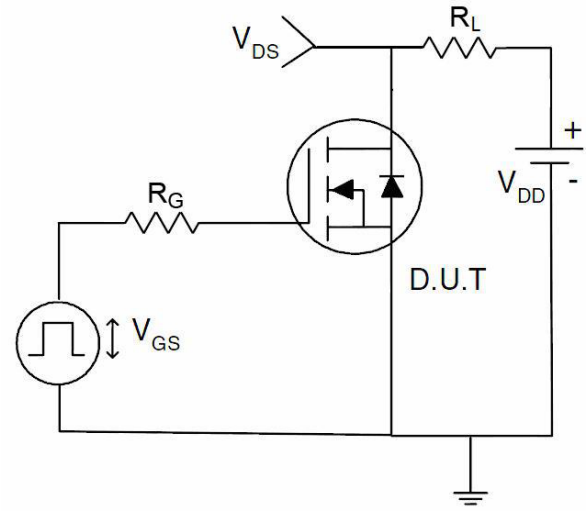
1) EAS test Circuit



2) Gate charge test Circuit



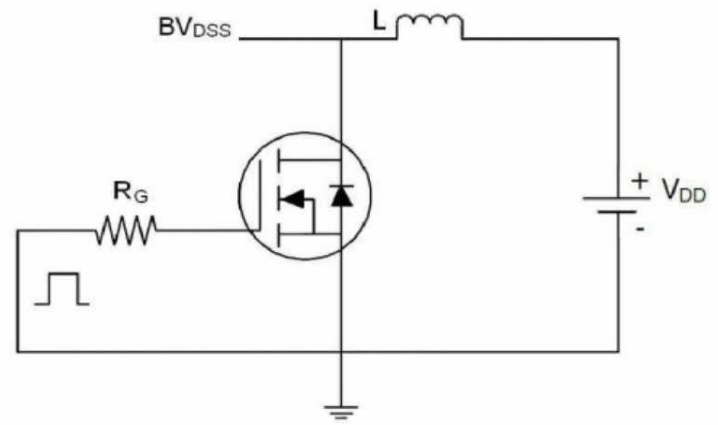
3) Switch Time Test Circuit



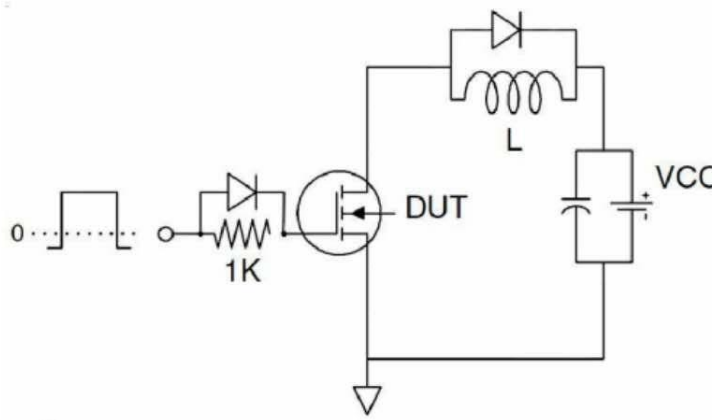
Typical Electrical and Thermal Characteristics (Curves)

Test Circuit

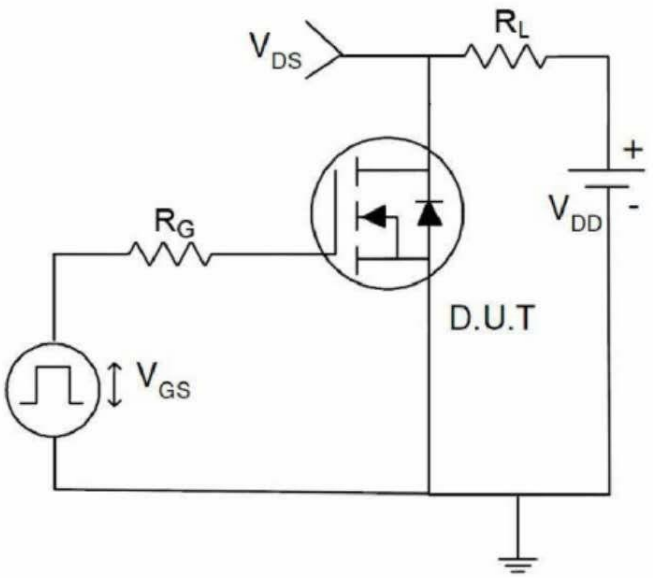
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



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Typical Electrical and Thermal Characteristics (Curves)

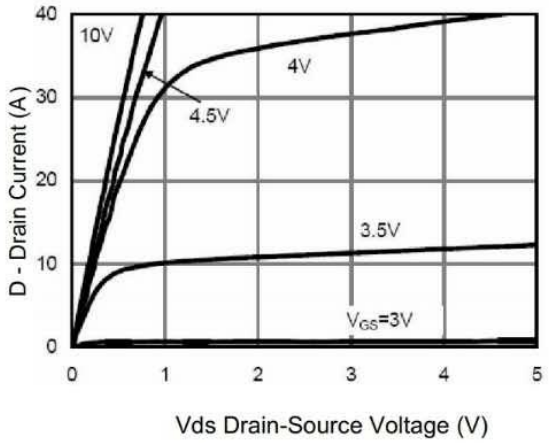

Figure 1 Output Characteristics

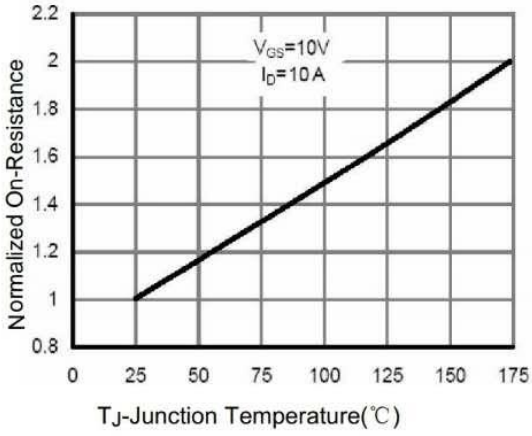

Figure 4 Rdson-Junction Temperature

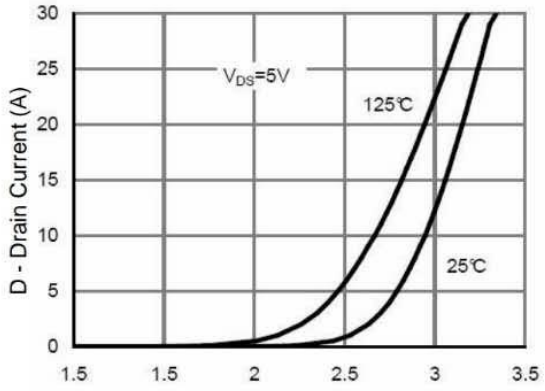

Figure 2 Transfer Characteristics

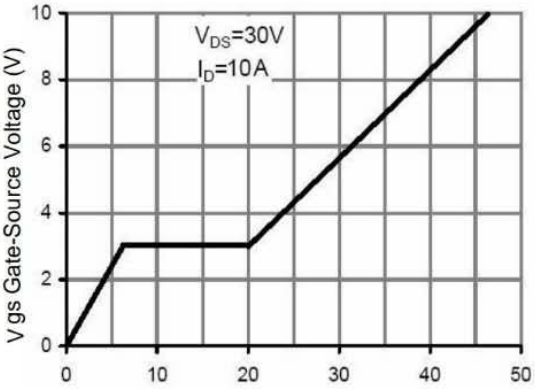

Figure 5 Gate Charge

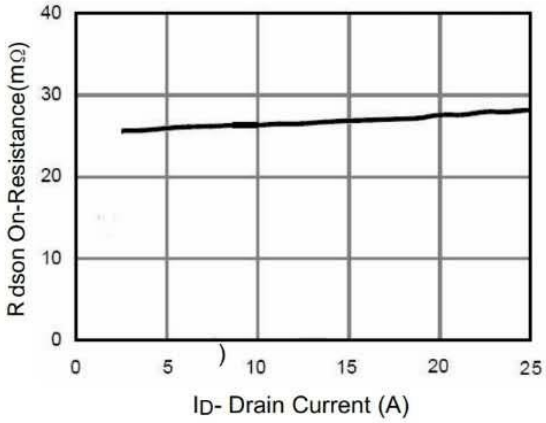

Figure 3 Rdson- Drain Current

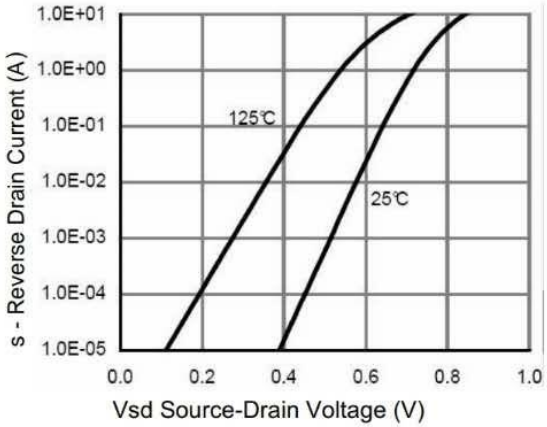

Figure 6 Source- Drain Diode Forward

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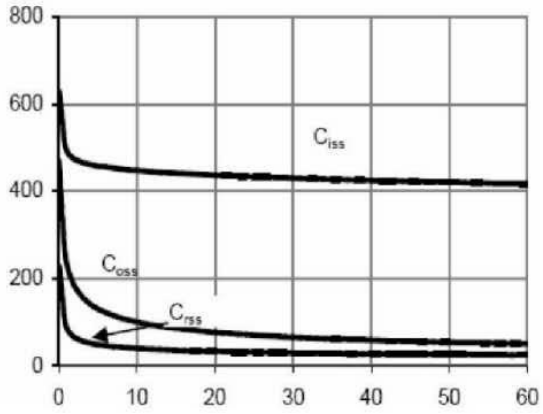

Figure 7 Capacitance vs Vds

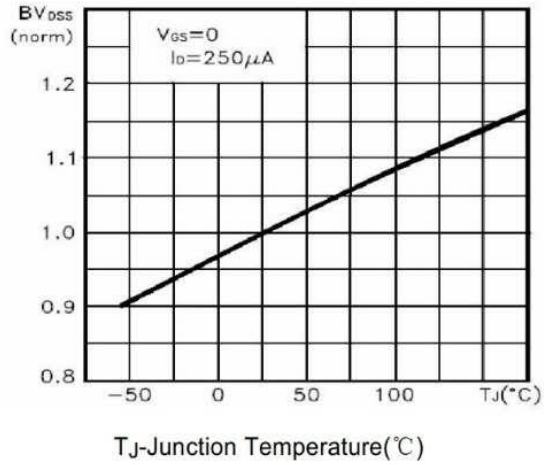

Figure 9 BV_{DSS} vs Junction Temperature

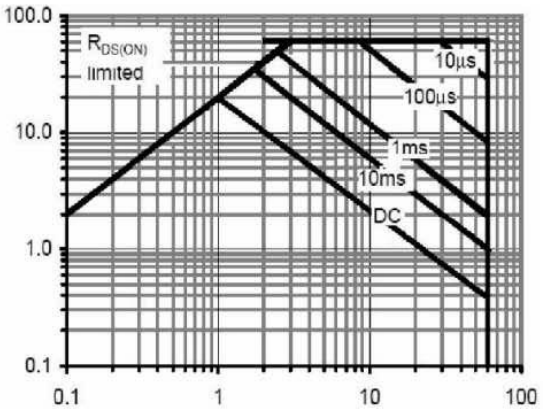

Figure 8 Safe Operation Area

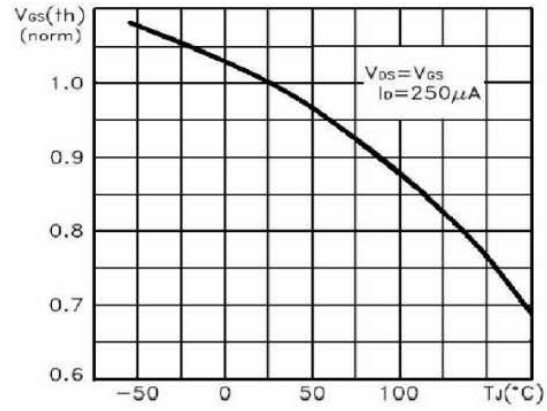

Figure 10 $V_{GS(th)}$ vs Junction Temperature

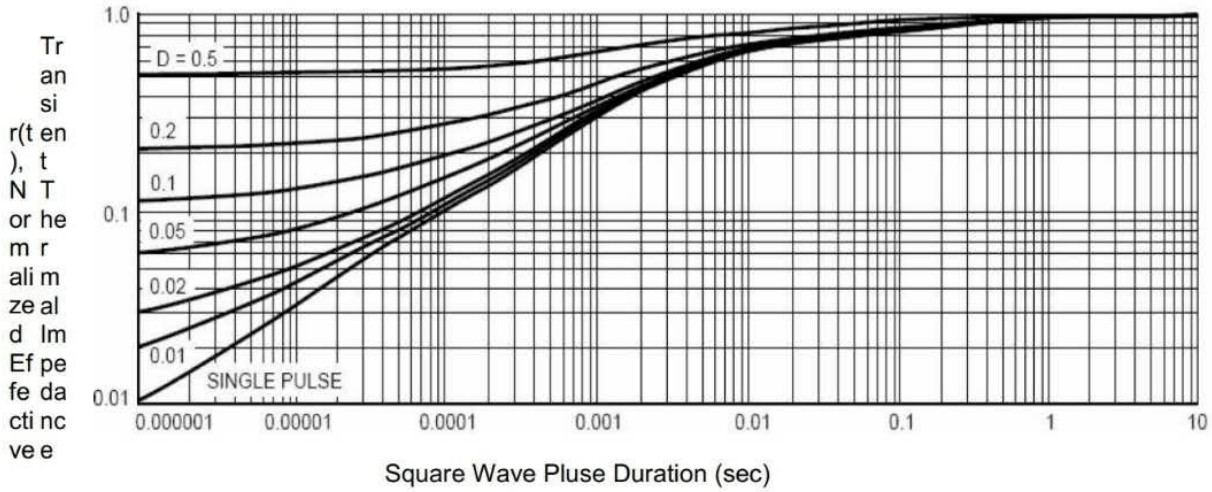

Figure 11 Normalized Maximum Transient Thermal Impedance

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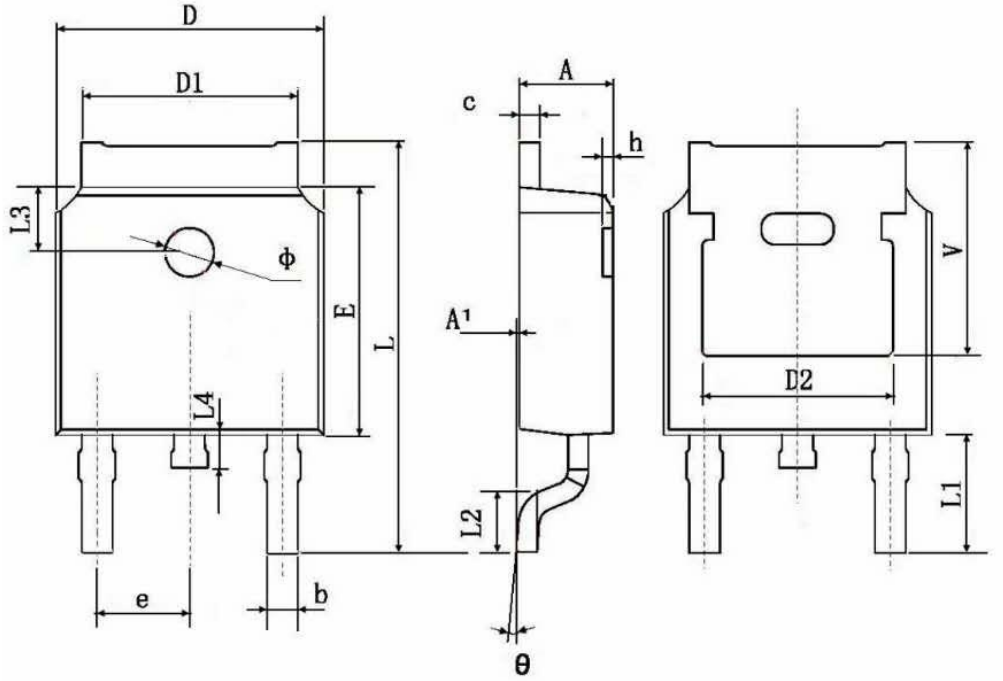
TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	0.483 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	