

MT0625S

N-Channel Enhancement Mode Field Effect Transistor



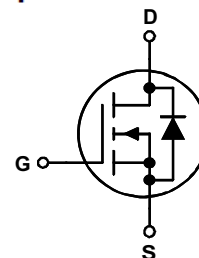
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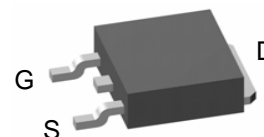
Features

- 60V, 35A
- $R_{DS(ON)} = 23m\Omega$ (Typ.) @ $V_{GS} = 10V$
- $R_{DS(ON)} = 30m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
- Low Total Gate Charge
- Low Reverse Transfer Capacitance
- Improved dv/dt Capability
- Fast Switching Speed

Simplified Schematic



MARKING DIAGRAM & PIN ASSIGNMENT



**D-PAK
TO-252-2L**

Applications

- Switching Applications.

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V _{DSS}	Drain-Source Voltage		60	V
V _{GSS}	Gate-Source Voltage		±20	V
I _D	Continuous Drain Current	T _C = 25°C	35	A
		T _C = 100°C	25	A
I _{DM}	Pulsed Drain Current ^{note1}		125	A
P _D	Power Dissipation	T _C = 25°C	30	W
R _{θJC}	Thermal Resistance, Junction to Case		5	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient		50	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +175	°C

Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V,I _D =250μA	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} = 0V, T _J = 25℃	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V,V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	0.7	1.3	2.0	V
R _{DS(on)} <small>note2</small>	Static Drain-Source on-Resistance	V _{GS} =10V, I _D =20A	-	23	27	mΩ
		V _{GS} =4.5V, I _D =10A	-	30	35	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 30V, V _{GS} = 0V, f = 1.0MHz	-	800	-	pF
C _{oss}	Output Capacitance		-	68	-	pF
C _{rss}	Reverse Transfer Capacitance		-	36	-	pF
Q _g	Total Gate Charge	V _{DS} =10V, I _D =30A, V _{GS} = 10V	-	15	-	nC
Q _{gs}	Gate-Source Charge		-	2.4	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	2.5	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =30V, R _L =1.0Ω, R _{REN} =3Ω,	-	5	-	ns
t _r	Turn-on Rise Time		-	39	-	ns
t _{d(off)}	Turn-off Delay Time		-	19	-	ns
t _f	Turn-off Fall Time		-	7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	35	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	125	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S =10A	-	-	1.2	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =20A,	-	23	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt=500A/μs	-	45	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

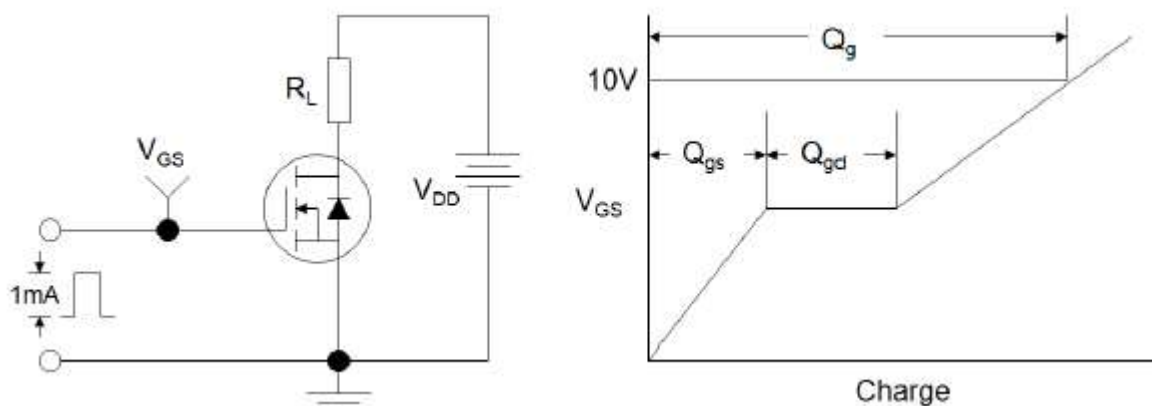


Figure1:Gate Charge Test Circuit & Waveform

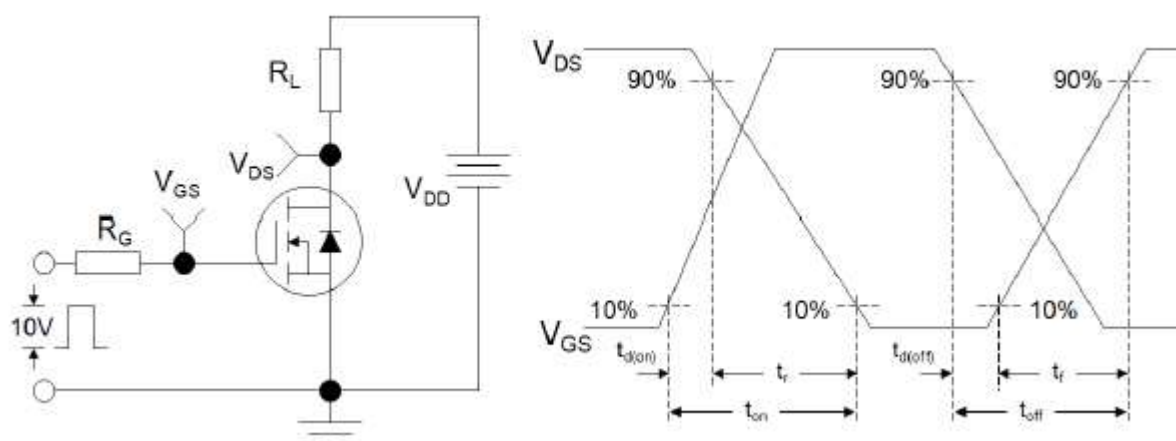


Figure 2: Resistive Switching Test Circuit & Waveforms

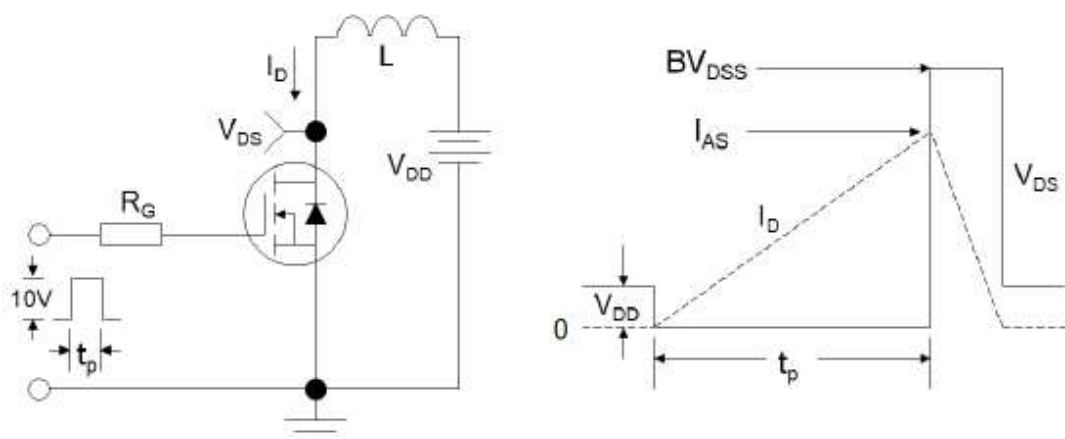


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

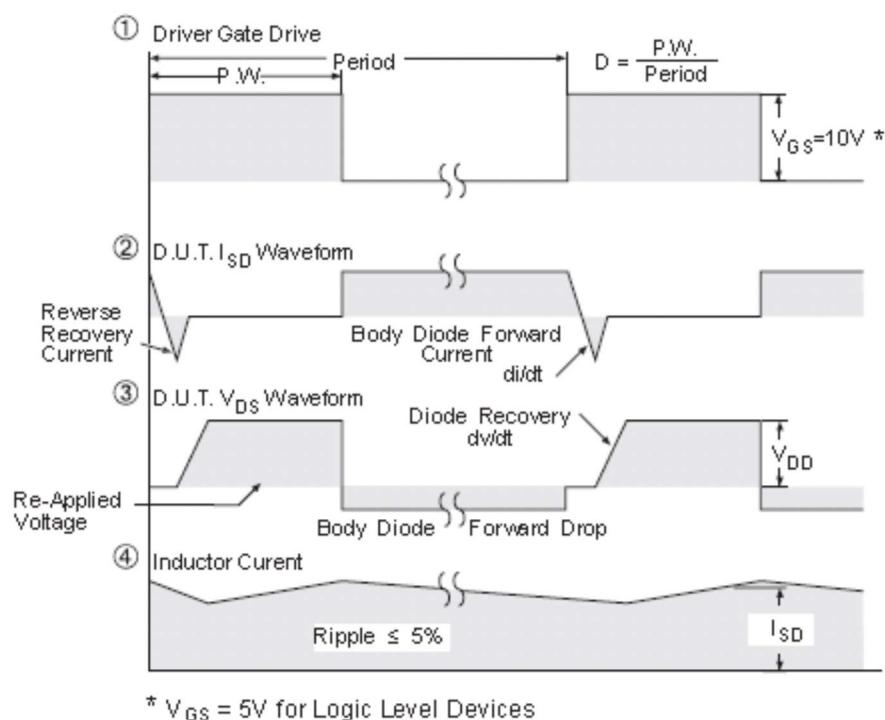
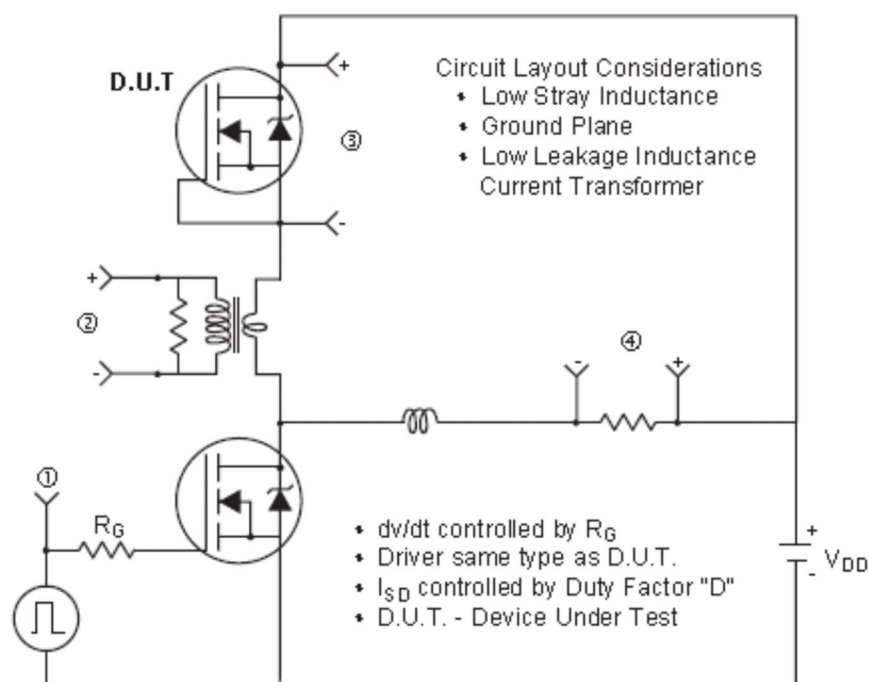
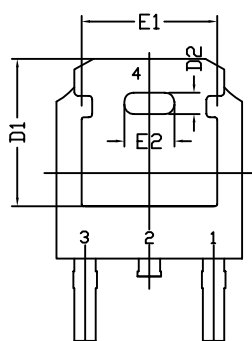
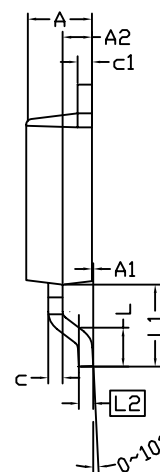
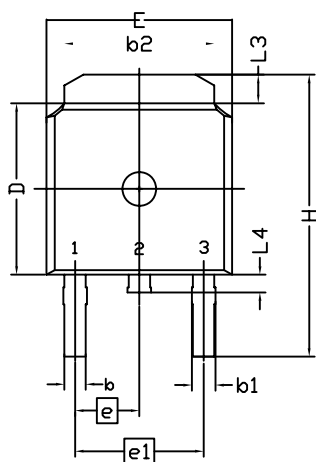
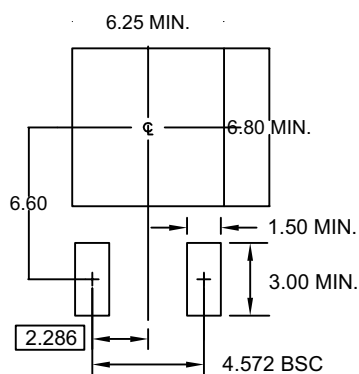


Figure 4: Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

Package Mechanical Data



RECOMMENDED LAND PATTERN



UNIT: mm

NOTE

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS. MOLD FLASH SHOULD BE LESS THAN 6 MILS.
2. DIMENSION L IS MEASURED IN GAUGE PLANE
3. TOLERANCE 0.10 mm UNLESS OTHERWISE SPECIFIED
4. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
5. REFER TO JEDEC TO-252 (AA)

SYMBOL	DIMENSION IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	2.184	2.286	2.388	0.086	0.090	0.094
A1	0.000	-----	0.127	0.000	-----	0.005
A2	0.889	1.041	1.143	0.035	0.041	0.045
b	0.635	0.762	0.889	0.025	0.030	0.035
b1	0.762	0.840	1.143	0.030	0.033	0.045
b2	4.953	5.340	5.461	0.195	0.210	0.215
c	0.450	0.508	0.610	0.018	0.020	0.024
c1	0.450	0.508	0.610	0.018	0.020	0.024
D	5.969	6.096	6.223	0.235	0.240	0.245
D1	5.210	5.249	5.380	0.205	0.207	0.212
D2	0.662	0.762	0.862	0.026	0.030	0.034
E	6.350	6.604	6.731	0.250	0.260	0.265
E1	4.318	4.826	4.901	0.170	0.190	0.193
E2	1.678	1.778	1.878	0.066	0.070	0.074
e	2.286 BSC			0.090 BSC		
e1	4.572 BSC			0.180 BSC		
H	9.398	10.033	10.414	0.370	0.395	0.410
L	1.270	1.520	2.032	0.050	0.060	0.080
L1	2.921 REF.			0.115REF.		
L2	0.408	0.508	0.608	0.016	0.020	0.024
L3	0.889	1.016	1.270	0.035	0.040	0.050
L4	0.635	-----	1.016	0.025	-----	0.040

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