

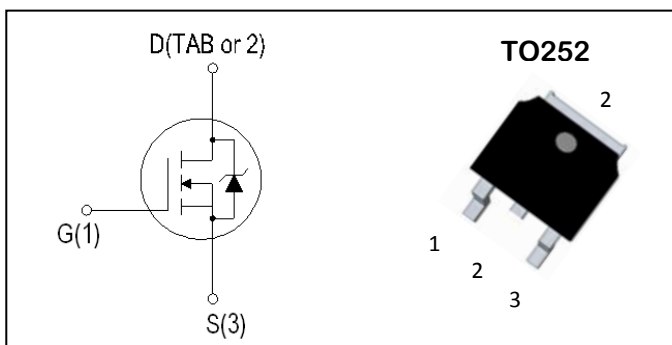
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- Fast Switching
- Ultra Low On-Resistance
- Optimized BVDSS Ruggedness
- Lead Free

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω)
40V	116A	3.9m Ω



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

Symbol	Parameter		Ratings	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		40	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	TC=25°C	116	A
Mounted on Large Heat Sink				
I _{DM}	300μs Pulse Drain Current Tested(1)	T _C =25°C	465	A
I _D	Continuous Drain Current	Silicon Limited	116	A
		Package Limited	80	A
P _D	Maximum Power Dissipation	T _C =25°C	100	W

1. Pulse width limited by maximum junction temperature.

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max	1.5	$^\circ\text{C/W}$
R_{thJA}	Thermal resistance junction-ambient max	110	$^\circ\text{C/W}$



Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
On/off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	40	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 32V, V _{GS} =0V	--	--	1	uA
		V _{DS} =32V, V _{GS} =0V T _J =125°C	--	--	10	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1	1.5	2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =± 20V, V _{DS} =0V	--	--	± 250	nA
R _{DS(ON)}	Drain-SourceOn-stateResistance ⁽²⁾	V _{GS} = 10V, I _{DS} =70A	--	3.1	3.9	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V,	--	2990	--	pF
C _{oss}	Output Capacitance	V _{DS} = 20V,	--	462	--	
C _{rss}	Reverse Transfer Capacitance	Frequency=1.0MHz	--	246	--	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time ⁽¹⁾	V _{DD} =20V,	--	16	--	ns
t _r	Turn-on Rise Time ⁽¹⁾	I _D = 35A, V _{GS} = 10V,	--	59	--	
t _{d(OFF)}	Turn-off Delay Time ⁽¹⁾	R _{GEN} =10 Ω , R _L =0.6 Ω	--	74	--	
t _f	Turn-off Fall Time ⁽¹⁾		--	41	--	
Q _g	Total Gate Charge ⁽¹⁾	V _{DD} =20V, V _{GS} = 10V,	--	51	--	nC
Q _{gs}	Gate-Source Charge ⁽¹⁾	I _{DS} =70A	--	15	--	
Q _{gd}	Gate-Drain Charge ⁽¹⁾		--	8	--	
Diode Characteristics						
V _{SD}	Diode Forward Voltage ⁽²⁾	I _{SD} = 70A, V _{GS} = 0	--	--	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =70A, dI _{SD} /dt=100A/μs	--	49.2	--	ns
q _{rr}	Reverse Recovery Charge		--	35.9	--	nC

NOTES:

- Independent of operating temperature.
- Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

Typical Performance Characteristics

Figure 1: On-Region Characteristics

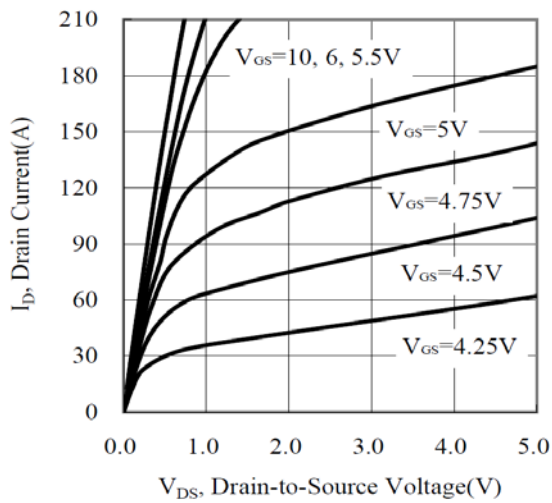


Figure 2: Power Dissipation

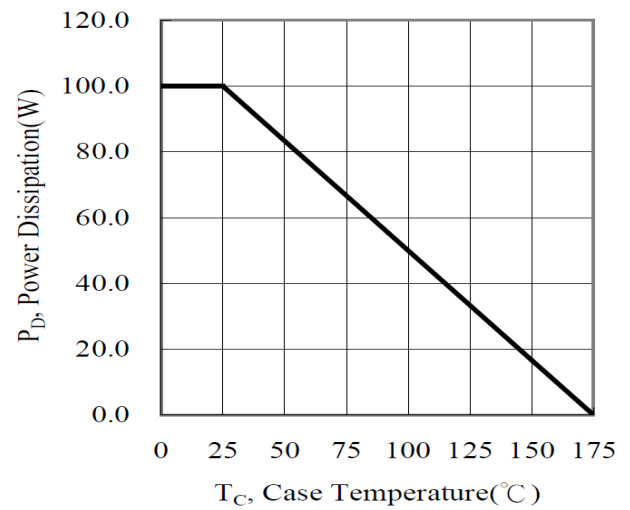


Figure 3: Drain Current

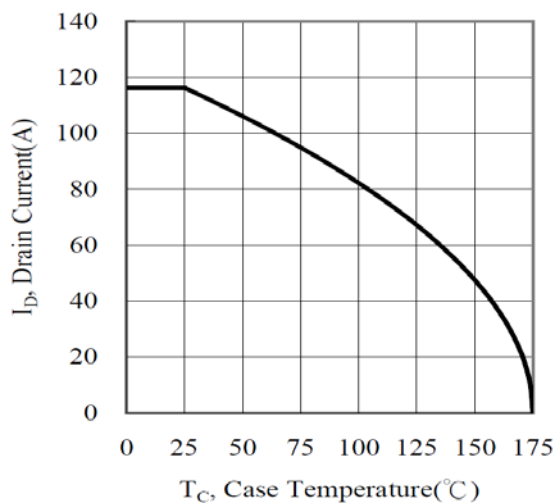


Figure 4: Gate Threshold Voltage

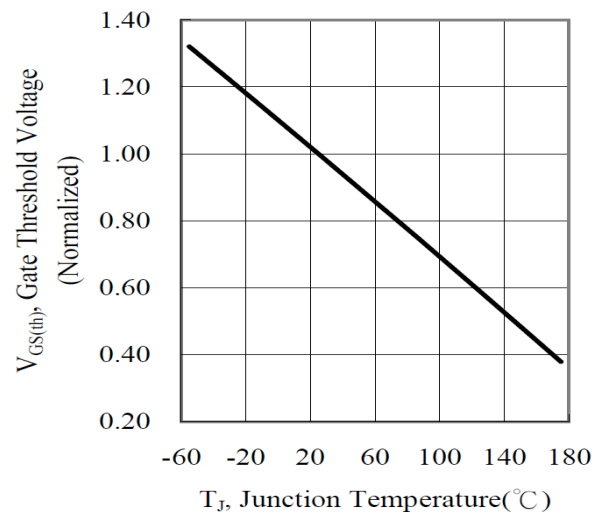


Figure 5: Capacitance Characteristics

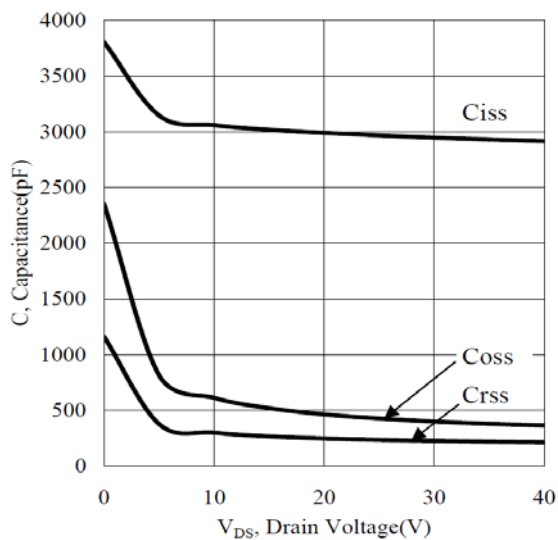


Figure 6: Gate Charge Characteristics

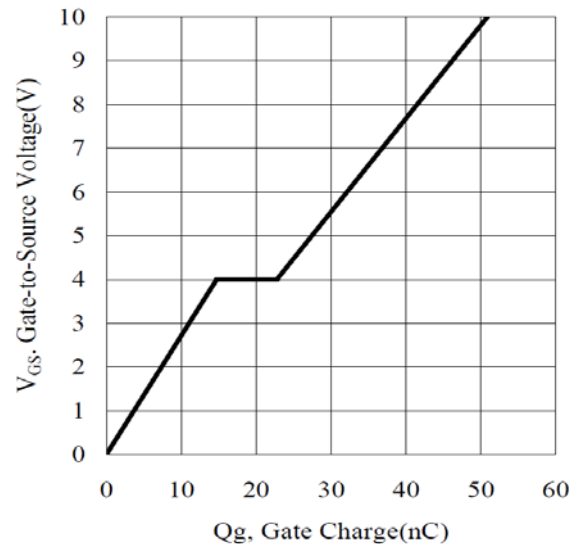


Figure 7: On-Resistance Variation vs. Temperature

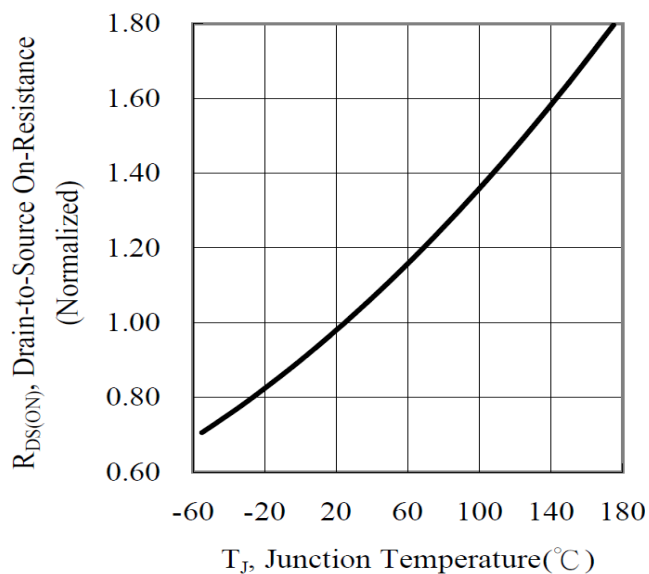


Figure 8: Body Diode Forward Voltage

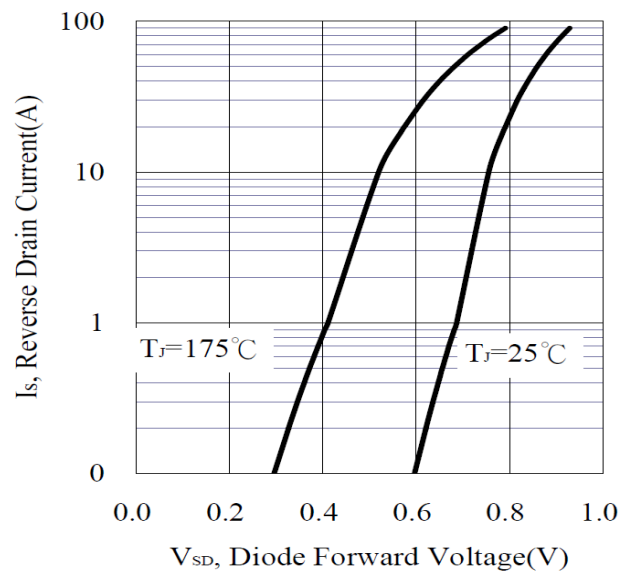
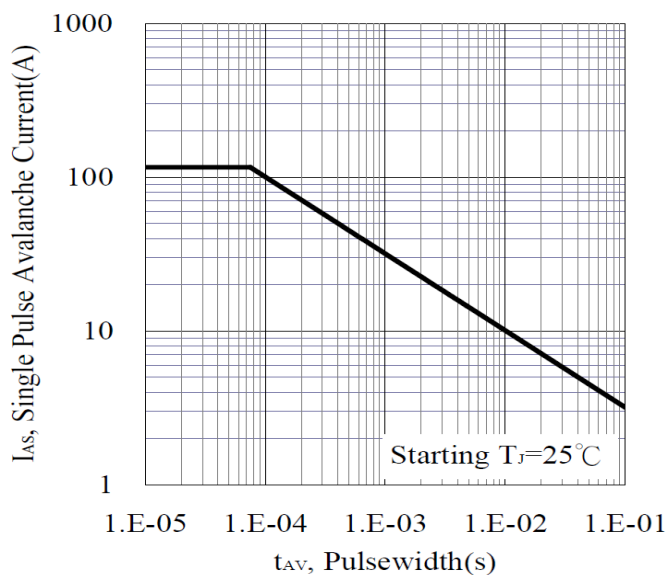
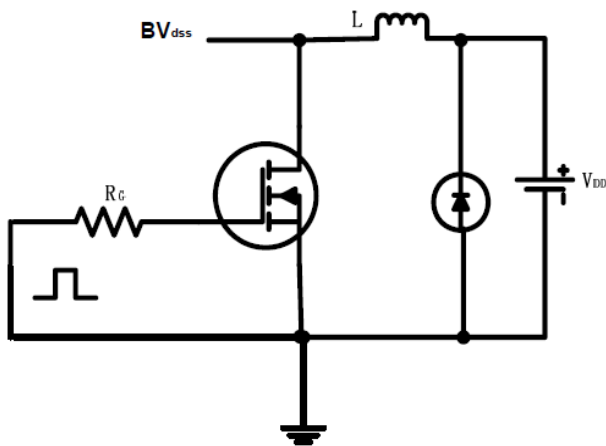


Figure 9: Avalanche Characteristics

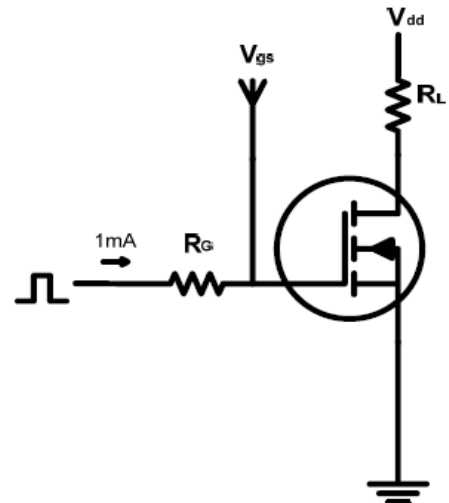


Test circuits and Waveforms

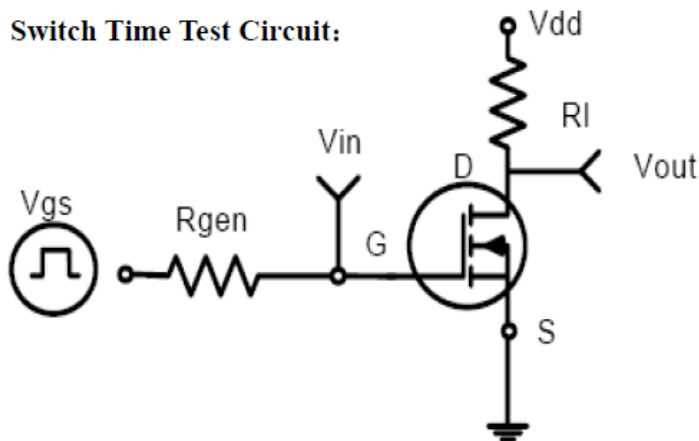
EAS test circuits:



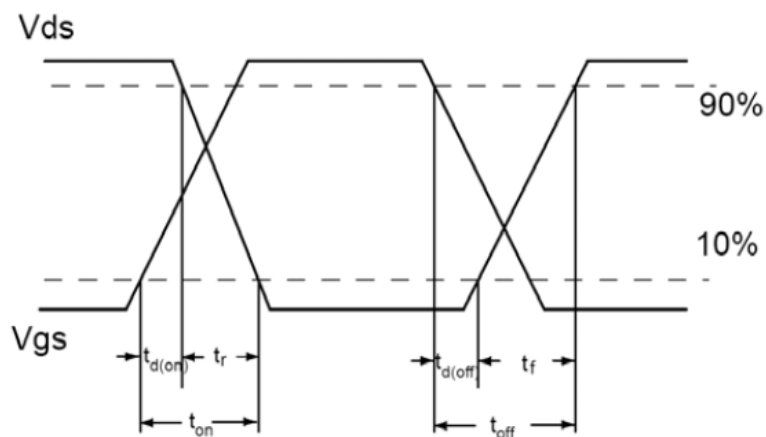
Gate charge test circuit:



Switch Time Test Circuit:

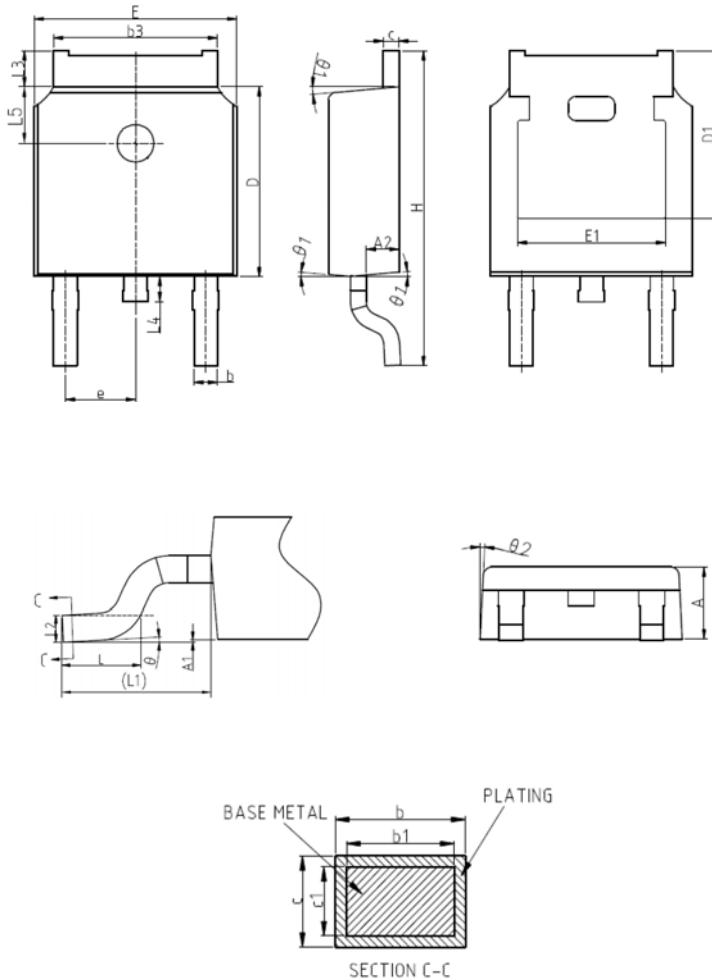


Switch Waveforms:



PACKAGE MECHANICAL DATA

TO-252-2 Package Dimension



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
A2	0.970	1.170	0.038	0.046
b	0.720	0.850	0.028	0.033
b1	0.700	0.900	0.028	0.035
b3	5.230	5.330	0.205	0.210
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.000	6.200	0.236	0.244
D1	5.300 TYP.		0.208 TYP.	
E	6.500	6.600	0.255	0.260
E1	4.700	4.920	0.185	0.193
e	2.286 TYP.		0.089 TYP.	
H	9.900	10.100	0.389	0.397
L	1.400	1.700	0.055	0.066
L1	2.900 REF.		0.114 REF.	
L2	0.510 REF.		0.020 REF.	
L3	0.900	1.250	0.035	0.049
L4	0.600	1.000	0.023	0.039
L5	1.700	1.900	0.067	0.074
θ	0°	8°	--	
θ_1	5°	9°	--	
θ_2	5°	9°	--	

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