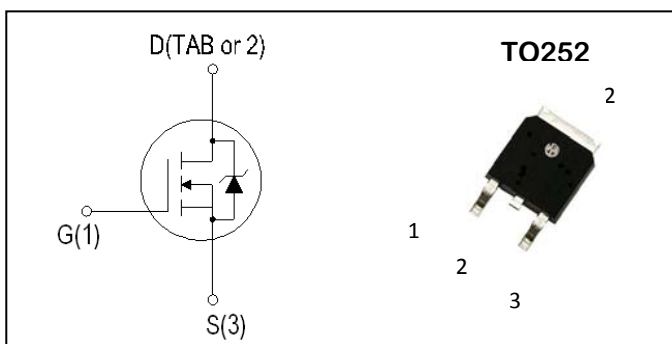


N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DS}	I_D	$R_{DS(ON)}$ (m Ω)
60V	50A	17m Ω



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

Symbol	Parameter		Ratings	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		60	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	T _C =25°C	50	A
Mounted on Large Heat Sink				
I _{DM}	300μs Pulse Drain Current Tested(1)	T _C =25°C	200	A
I _D	Continuous Drain Current	T _C =25°C	50	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	60	$^\circ\text{C/W}$

Electrical Characteristics (TA=25°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	60	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V	--	--	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1.0	1.6	2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
R _{DS(ON)}	Drain-SourceOn-stateResistance ⁽²⁾	V _{GS} = 10V, I _{DS} =30A	--	12	17	mΩ
g _{FS}	Forward transconductance ⁽²⁾	V _{DS} = 5V, I _{DS} =15A	--	24	--	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V,	--	1920	--	pF
C _{oss}	Output Capacitance	V _{DS} = 30V,	--	155	--	
C _{rss}	Reverse Transfer Capacitance	Frequency=1.0MHz	--	116	--	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time ⁽¹⁾	V _{DD} =30V, I _D = 20A, V _{GS} = 10V, R _{GEN} =3 Ω	--	7.4	--	ns
t _r	Turn-on Rise Time ⁽¹⁾		--	5.1	--	
t _{d(OFF)}	Turn-off Delay Time ⁽¹⁾		--	28.2	--	
t _f	Turn-off Fall Time ⁽¹⁾		--	5.5	--	
Q _g	Total Gate Charge ⁽¹⁾	V _{DS} =30V, V _{GS} = 10V, I _{DS} =30A	--	48	--	nC
Q _{gs}	Gate-Source Charge ⁽¹⁾		--	6	--	
Q _{gd}	Gate-Drain Charge ⁽¹⁾		--	14	--	
Diode Characteristics						
V _{SD}	Diode Forward Voltage ⁽²⁾	I _{SD} = 1A, V _{GS} = 0	--	--	1	V
t _{rr}	Reverse Recovery Time	I _{SD} =30A, dI _{SD} /dt=100A/μs	--	34	--	ns
q _{rr}	Reverse Recovery Charge		--	46	--	nC

NOTES:

1. Independent of operating temperature.
2. Pulse Test : Pulse width ≤ 300 μs, Duty cycle ≤ 2%

Typical Performance Characteristics

Figure 1: On-Region Characteristics

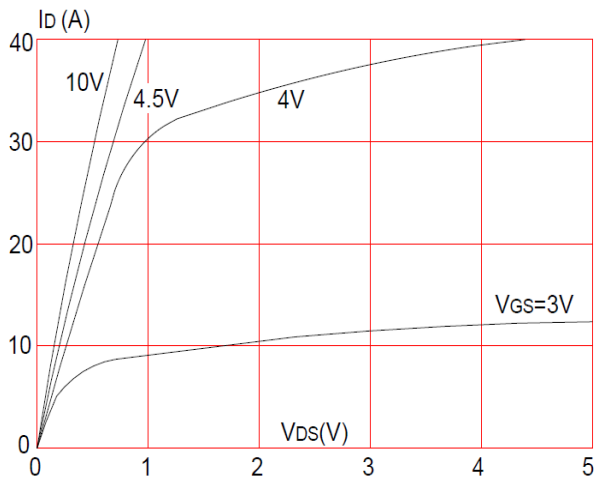


Figure 2: Typ.transfer Characteristics

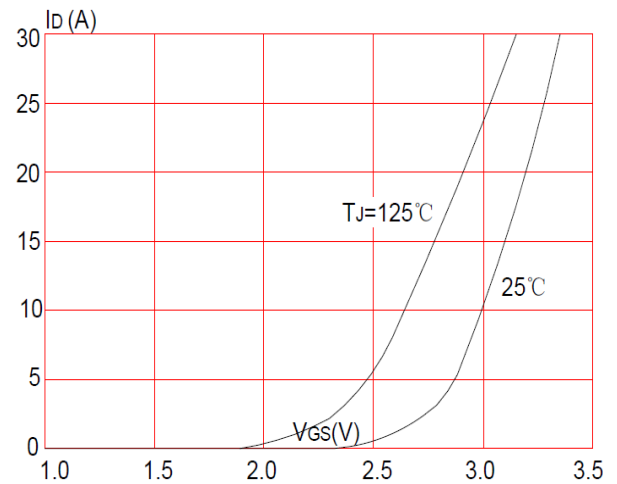


Figure 3: Forward Characteristics of Reverse

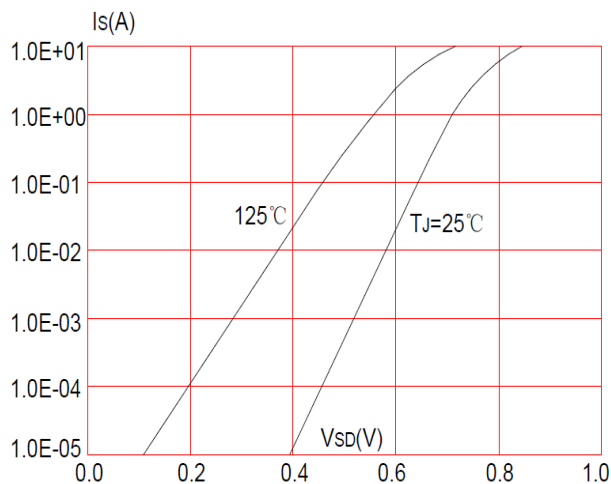


Figure 4: Maximum Continuous Drain Current vs. Case Temperature

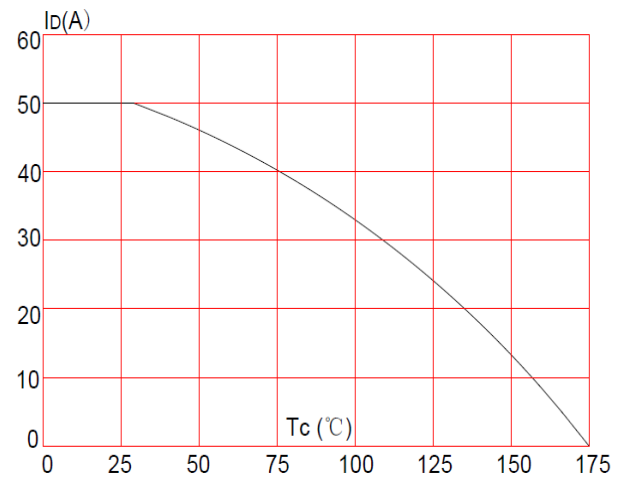


Figure 5: On-resistance vs. Drain Current

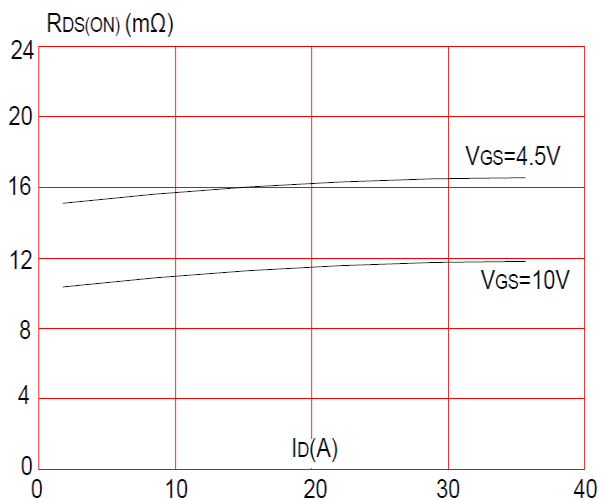


Figure 6: Gate Charge Characteristics

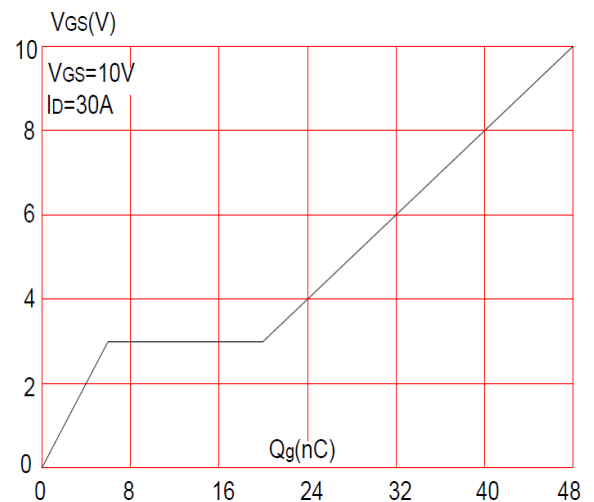


Figure 7: Capacitance

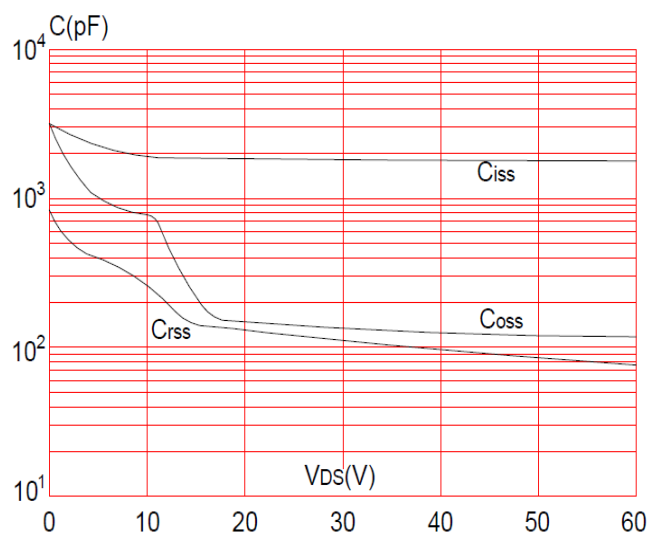


Figure 8: Safe Operating Area

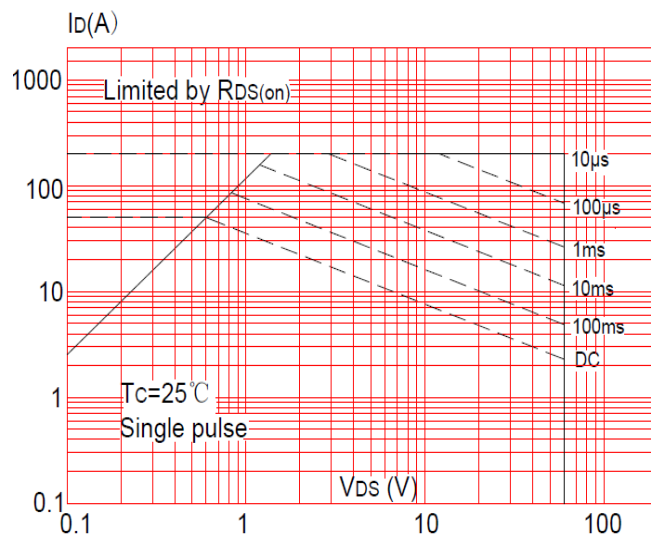
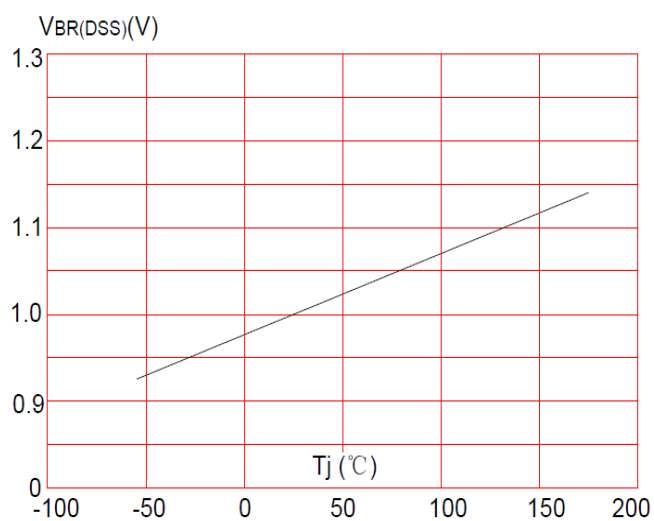
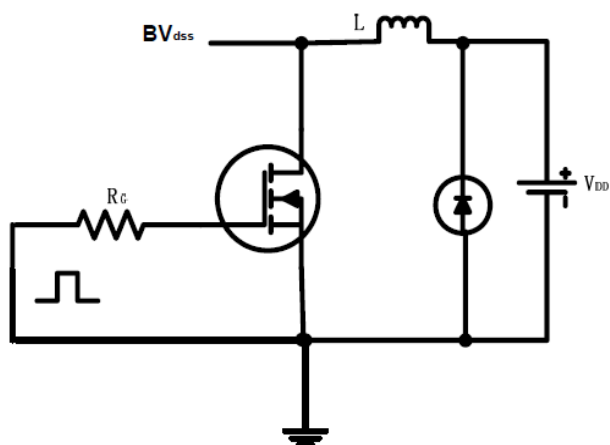


Figure 9: Normalized Breakdown Voltage vs. Junction Temperature

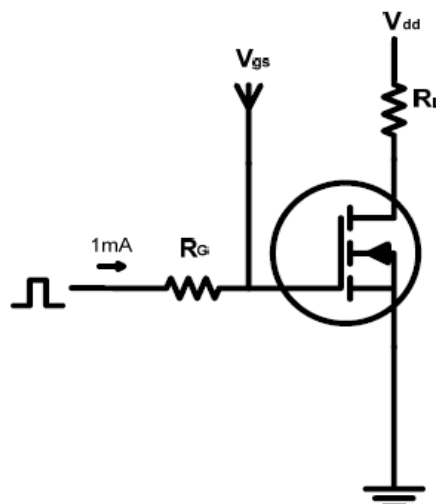


Test circuits and Waveforms

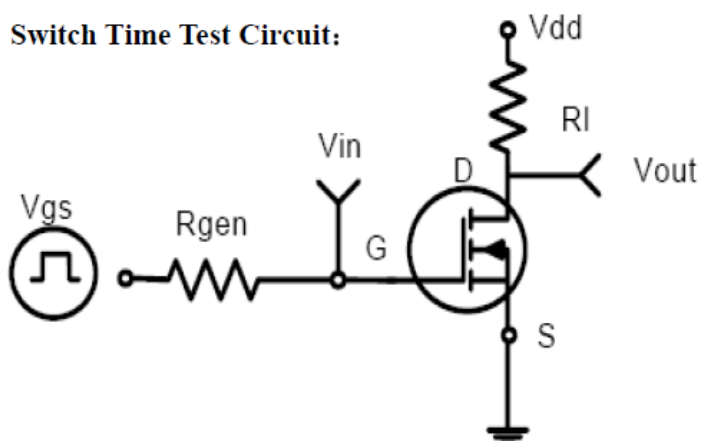
EAS test circuits:



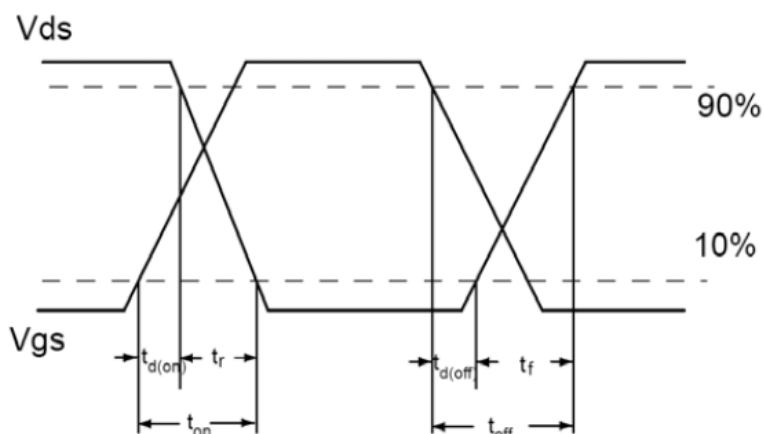
Gate charge test circuit:



Switch Time Test Circuit:

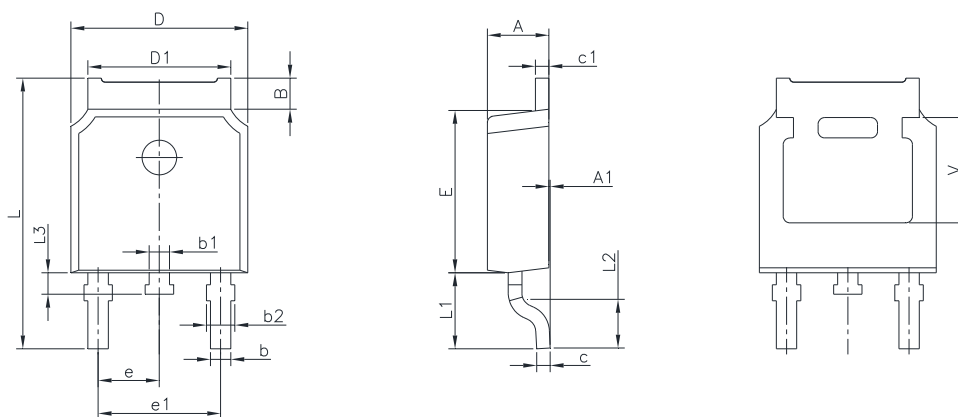


Switch Waveforms:



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
B	0.880	1.220	0.035	0.048
b	0.660	0.850	0.026	0.033
b1	0.660	0.850	0.026	0.033
c	0.450	0.620	0.017	0.024
c1	0.450	0.620	0.017	0.024
D	6.350	6.800	0.250	0.268
D1	5.200	5.480	0.205	0.216
E	5.900	6.200	0.232	0.244
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	10.60	0.374	0.396
L1	2.650	3.050	0.104	0.120
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.950 REF.		0.155 REF.	