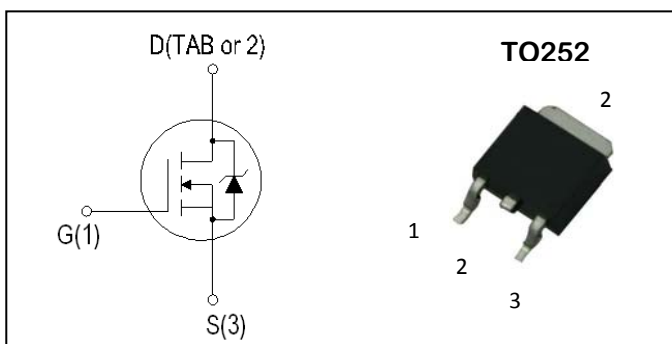


N-Channel Enhancement Mode Field Effect Transistor**PRODUCT SUMMARY**

V_{DSS}	I_D	$R_{DS(ON)} (m\Omega)$
30V	60A	8.5m Ω

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

Symbol	Parameter		Ratings	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		30	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current	TC=25°C	60	A
Mounted on Large Heat Sink				
I _{DM}	300μs Pulse Drain Current Tested(1)	TC=25°C	110	A
I _D	Continuous Drain Current	TC=25°C	60	A
		TC=100°C	40	A
P _D	Maximum Power Dissipation	TC=25°C	41	W

1. Pulse width limited by maximum junction temperature.

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max	3.6	$^\circ\text{C/W}$
R_{thJA}	Thermal resistance junction-ambient max	62	$^\circ\text{C/W}$

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	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 24V, V _{GS} =0V	--	--	1	uA
		V _{DS} =24V, V _{GS} =0V T _J =55°C	--	--	5	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1.2	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} =30A	--	7.5	8.5	mΩ
g _{FS}	Forward transconductance(2)	V _{DS} = 5V, I _{DS} =30A	--	38	--	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} = 15V, Frequency=1.0MHz	--	1317	1843	pF
C _{oss}	Output Capacitance		--	163	228	
C _{rss}	Reverse Transfer Capacitance		--	131	183	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time(1)	V _{DD} =15V, I _D = 15A, V _{GS} = 10V, R _{GEN} =3.3 Ω , R _L =6.8 Ω	--	4.6	9.2	ns
t _r	Turn-on Rise Time(1)		--	12.2	22	
t _{d(OFF)}	Turn-off Delay Time(1)		--	26.6	53	
t _f	Turn-off Fall Time(1)		--	8	16	
Q _g	Total Gate Charge(1)	V _{DS} =15V, V _{GS} = 4.5V, I _{DS} =15A	--	12.6	17.6	nC
Q _{gs}	Gate-Source Charge(1)		--	4.2	5.9	
Q _{gd}	Gate-Drain Charge(1)		--	5.1	7.1	
Diode Characteristics						
V _{SD}	Diode Forward Voltage(2)	I _{SD} = 1A, V _{GS} = 0	--	--	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =30A, dI _{SD} /dt=100A/μs	--	9.2	--	ns
q _{rr}	Reverse Recovery Charge		--	2	--	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

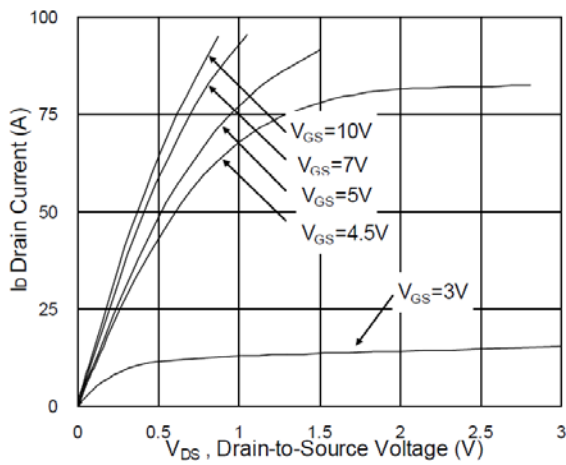


Figure 2: Forward Characteristics of Reverse

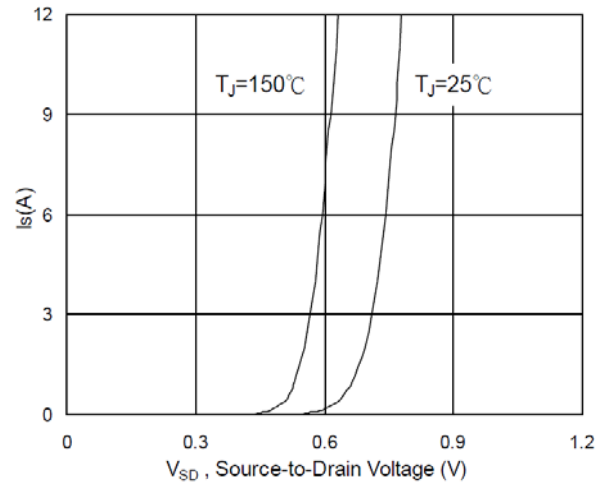


Figure 3: Normalized $V_{GS(th)}$ vs. T_J

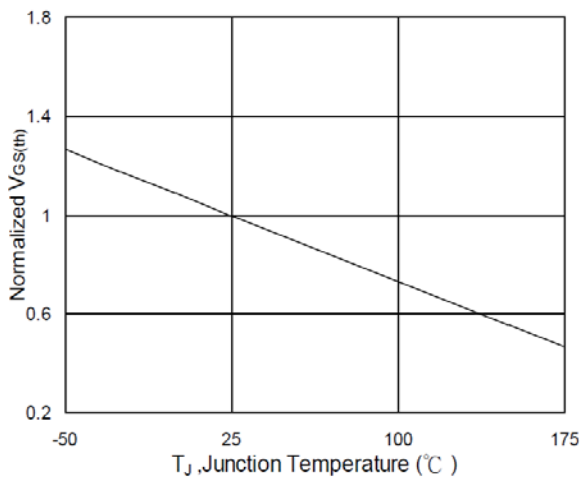


Figure 4: On-Resistance with Gate-to-source Voltage

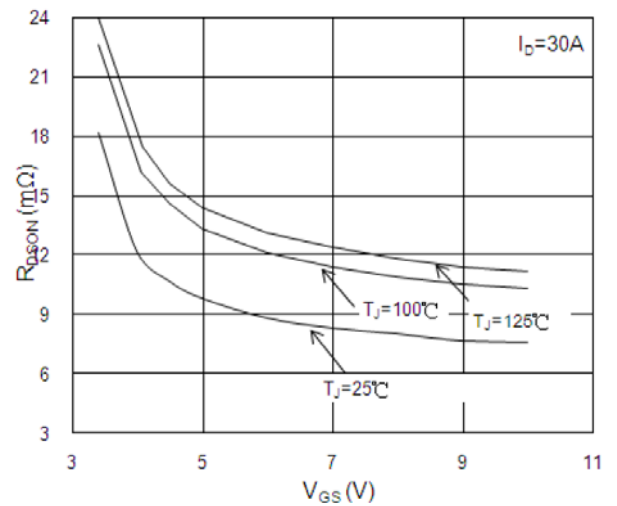


Figure 5: Normalized $R_{DS(on)}$ vs. T_J

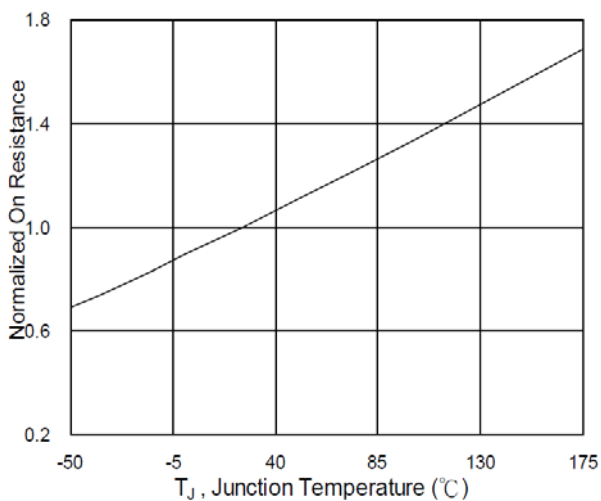


Figure 6: Gate Charge Characteristics

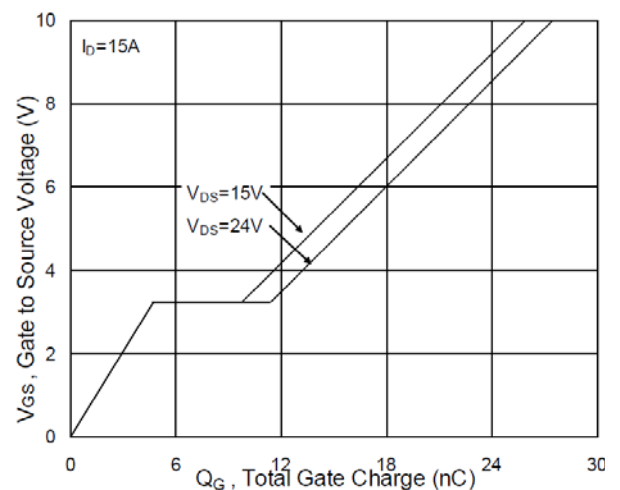


Figure 7: Safe Operating Area

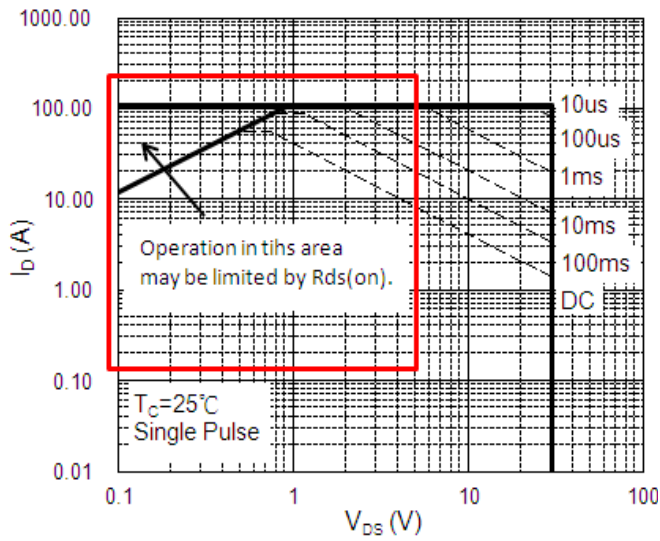


Figure 8: Capacitance

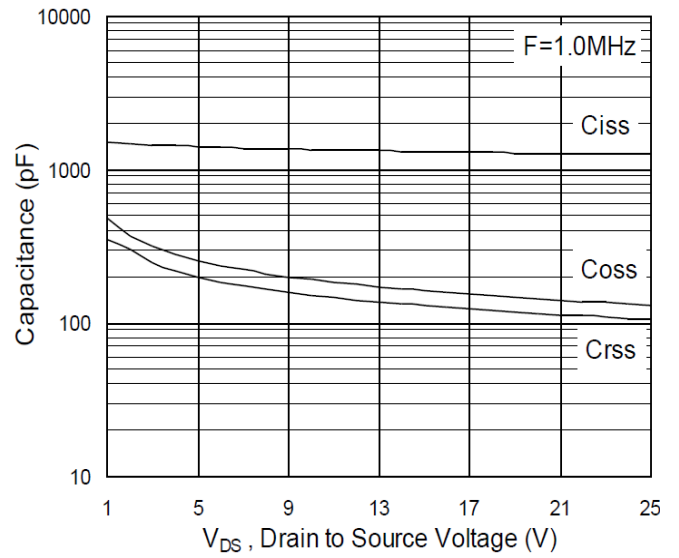
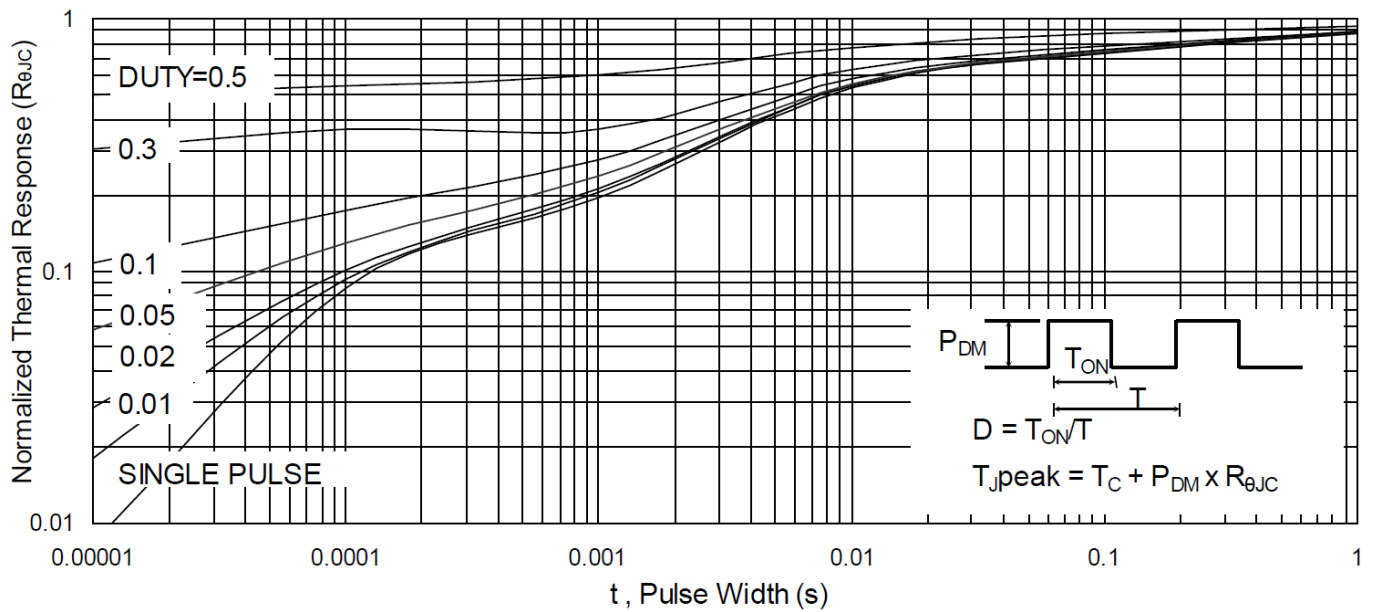
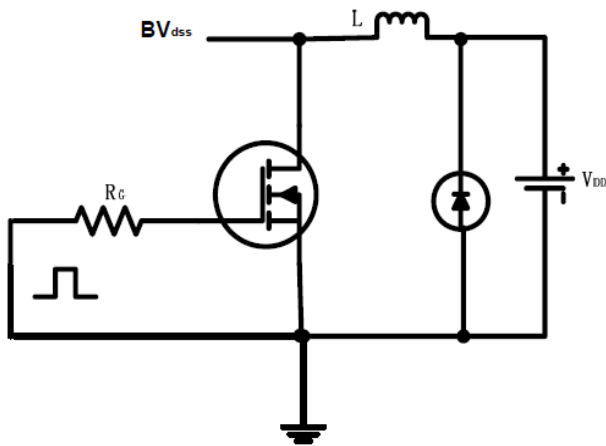


Figure 9: Transient Thermal Response Curve

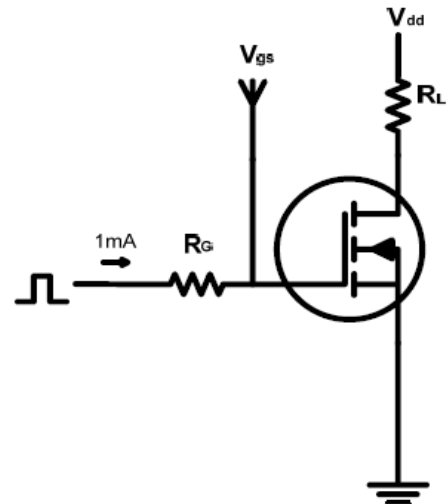


Test circuits and Waveforms

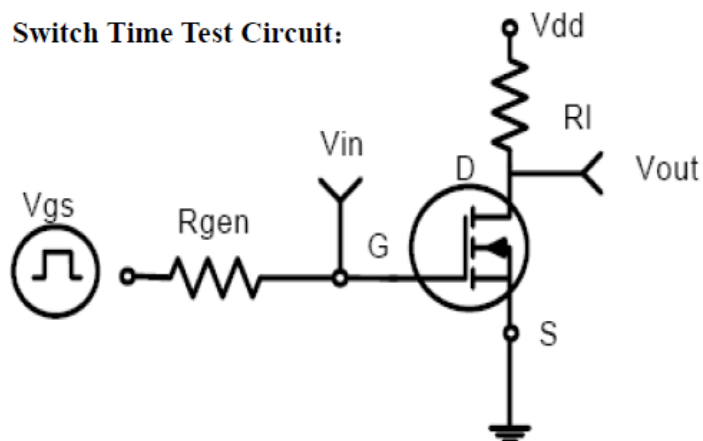
EAS test circuits:



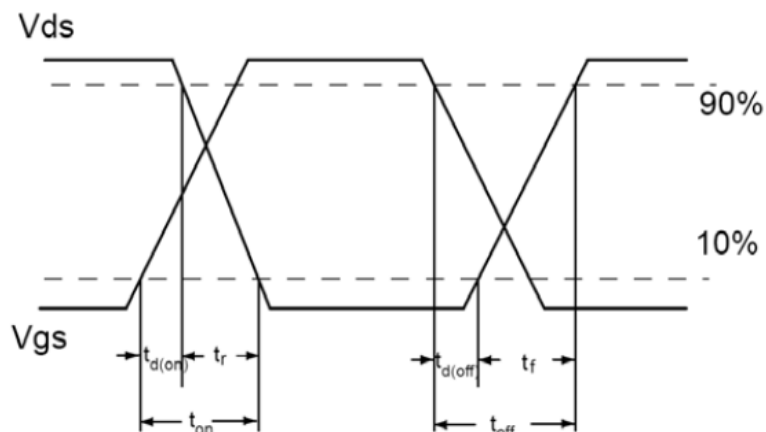
Gate charge test circuit:



Switch Time Test Circuit:

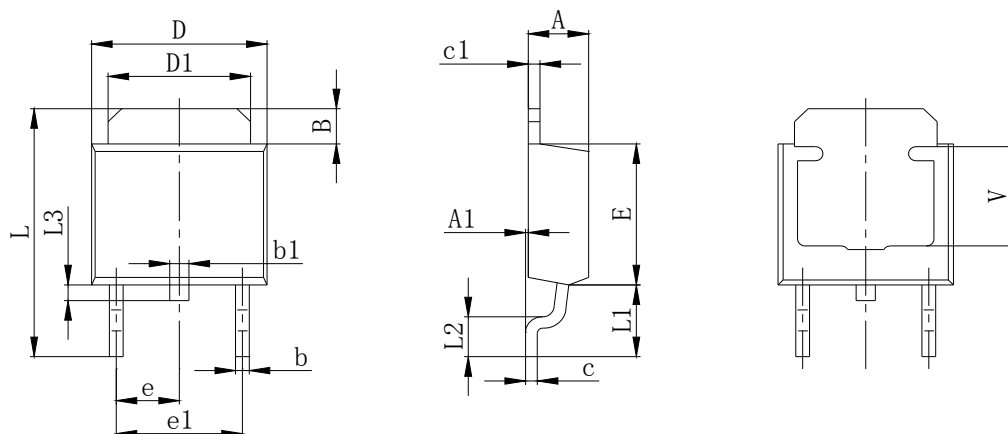


Switch Waveforms:



PACKAGE MECHANICAL DATA

TO-252 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	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	