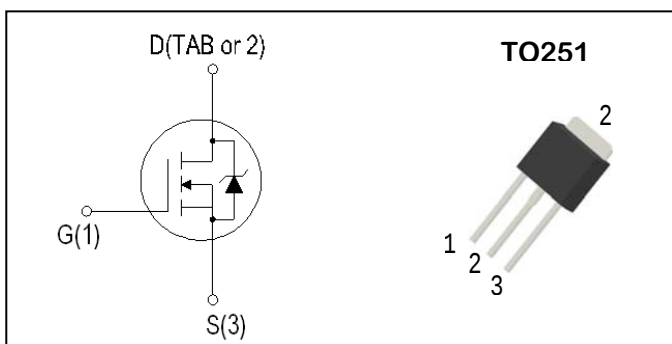


N-Channel Enhancement Mode Field Effect Transistor**PRODUCT SUMMARY**

V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω)
30V	160A	3.0m 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	160	A
Mounted on Large Heat Sink				
I _{DM}	300μs Pulse Drain Current Tested(1)	T _C =25°C	640	A
I _D	Continuous Drain Current	T _C =25°C	160	A
P _D	Maximum Power Dissipation	T _C =25°C	150	W

1. Pulse width limited by maximum junction temperature.

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max	1.0	$^\circ\text{C/W}$
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} =30V, V _{GS} =0V T _J =55°C	--	--	5	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1	1.6	2.0	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	--	2.0	3.0	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} = 15V, Frequency=1.0MHz	--	3550	--	pF
C _{oss}	Output Capacitance		--	1300	--	
C _{rss}	Reverse Transfer Capacitance		--	90	--	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time(1)	V _{DD} =20V, I _D = 10A, V _{GS} = 10V, R _{GEN} =3 Ω	--	12	--	ns
t _r	Turn-on Rise Time(1)		--	10	--	
t _{d(OFF)}	Turn-off Delay Time(1)		--	38	--	
t _f	Turn-off Fall Time(1)		--	10	--	
Q _g	Total Gate Charge(1)	V _{DS} =20V, V _{GS} = 10V, I _{DS} =20A	--	48	--	nC
Q _{gs}	Gate-Source Charge(1)		--	9	--	
Q _{gd}	Gate-Drain Charge(1)		--	7	--	
Diode Characteristics						
V _{SD}	Diode Forward Voltage(2)	I _{SD} = 1A, V _{GS} = 0	--	--	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =20A, dI _{SD} /dt=100A/μs	--	21	--	ns
q _{rr}	Reverse Recovery Charge		--	58	--	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

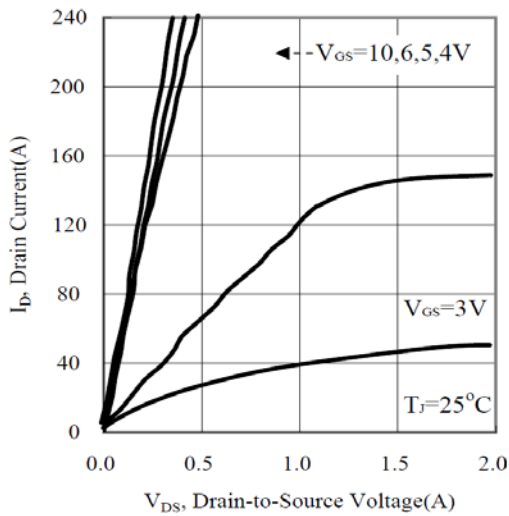


Figure 2: Power Dissipation

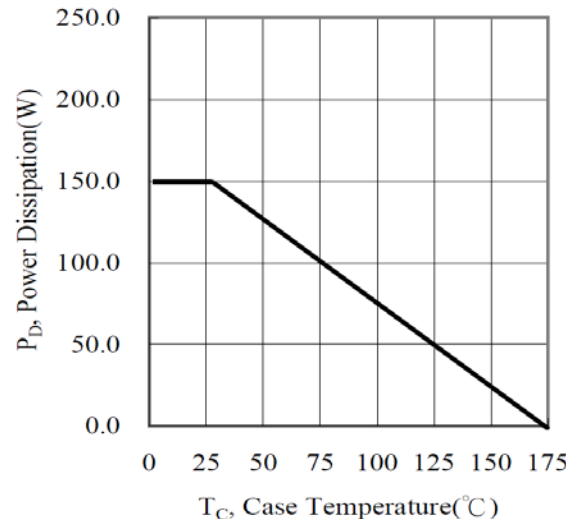


Figure 3: Drain Current

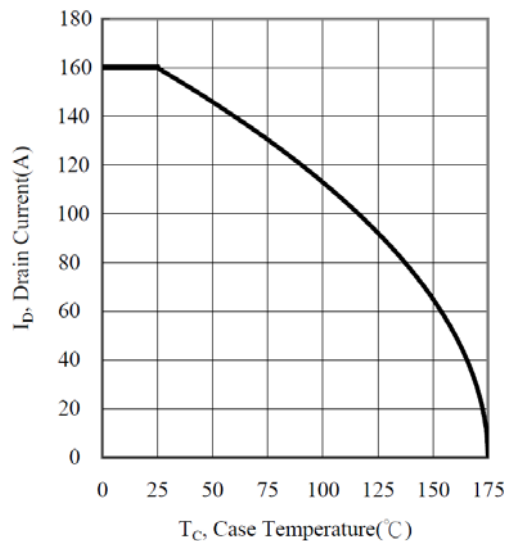


Figure 4: Drain-to-Source Breakdown Voltage

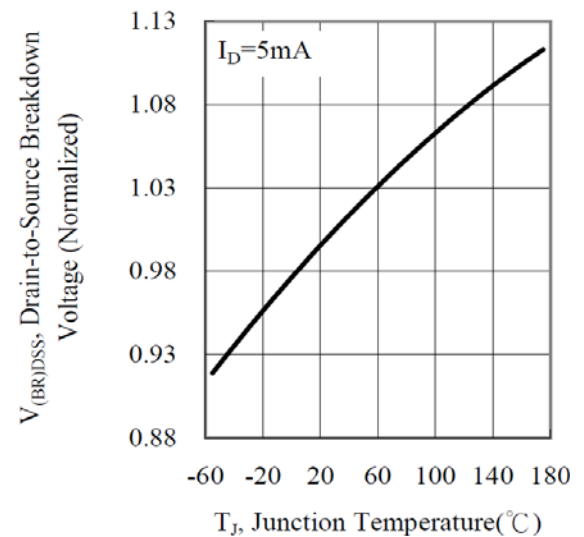


Figure 5: Capacitance Characteristics

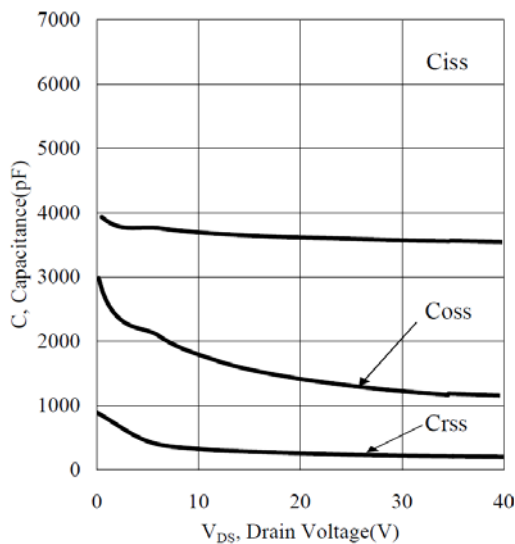


Figure 6: Gate Charge Characteristics

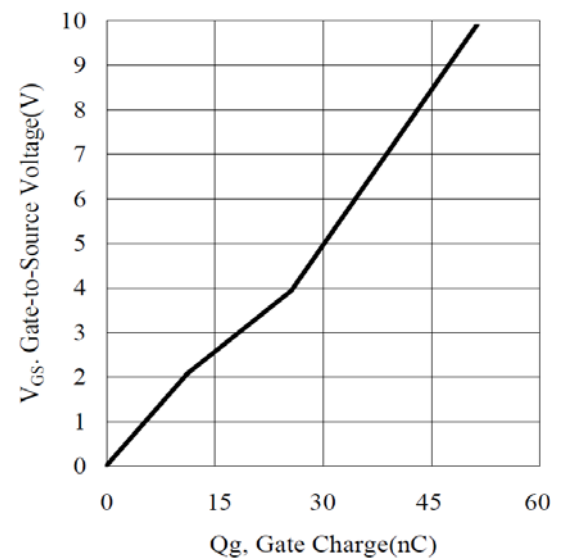


Figure 7: Gate Threshold Voltage

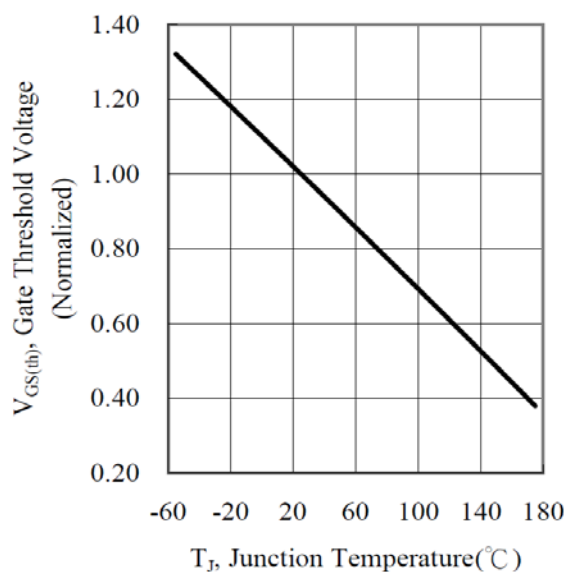


Figure 8: Drain-to-Source On-Resistance

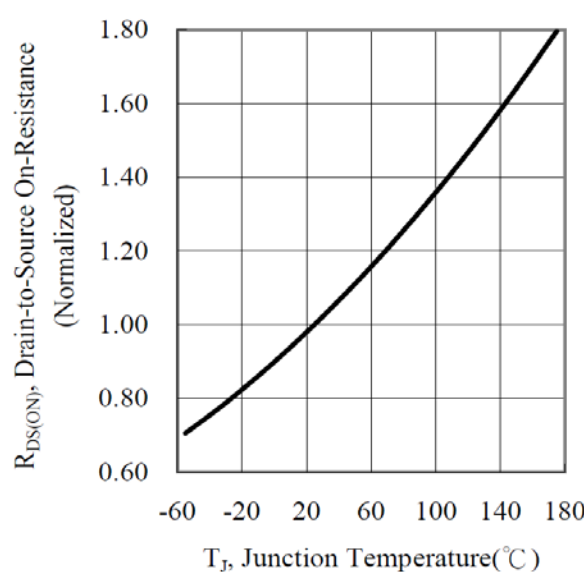


Figure 9: Avalanche Characteristics

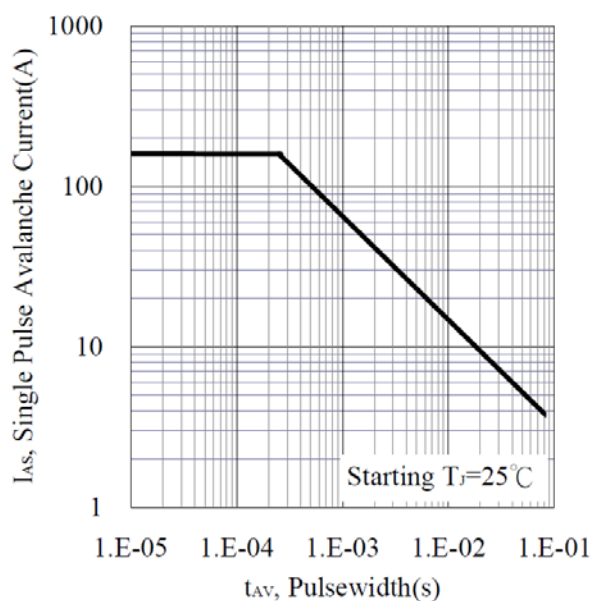
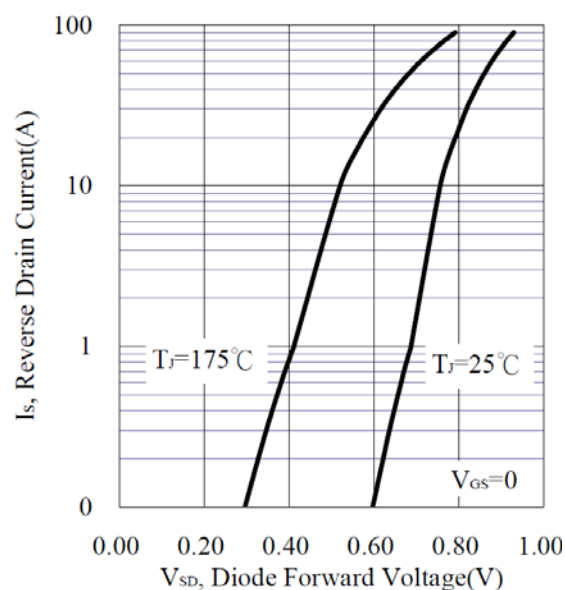
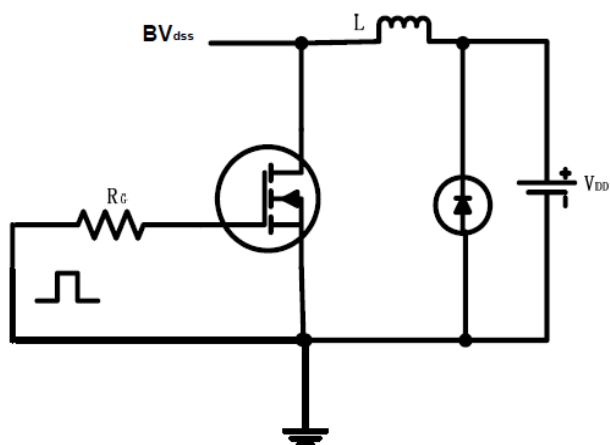


Figure 10: Forward Characteristics of reverse diode

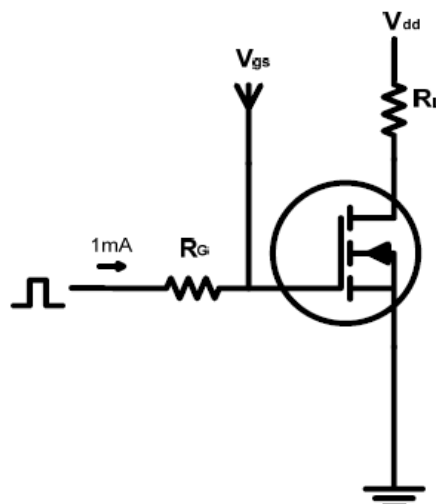


Test circuits and Waveforms

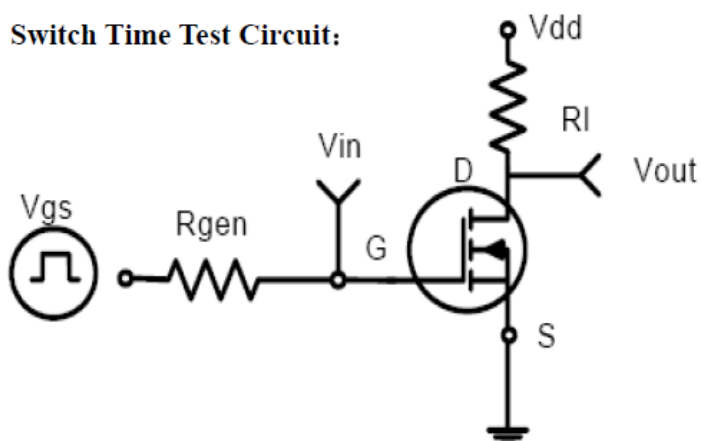
EAS test circuits:



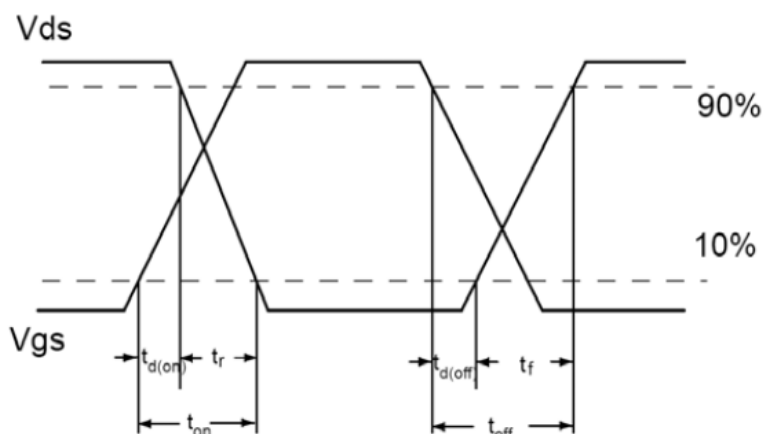
Gate charge test circuit:



Switch Time Test Circuit:

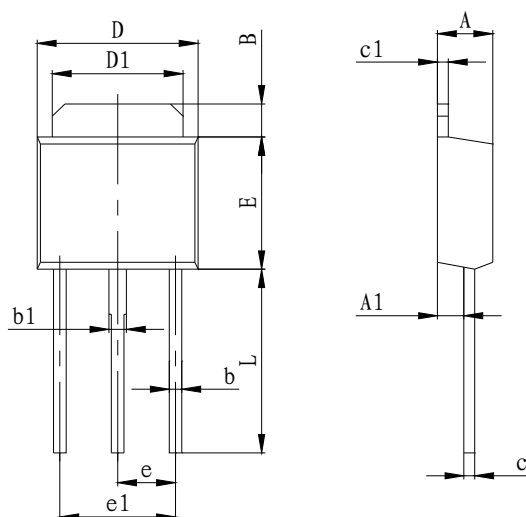


Switch Waveforms:



PACKAGE MECHANICAL DATA

TO-251 Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	1.050	1.350	0.042	0.054
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	2.300TYP		0.091TYP	
e1	4.500	4.700	0.177	0.185
L	7.500	7.900	0.295	0.311