

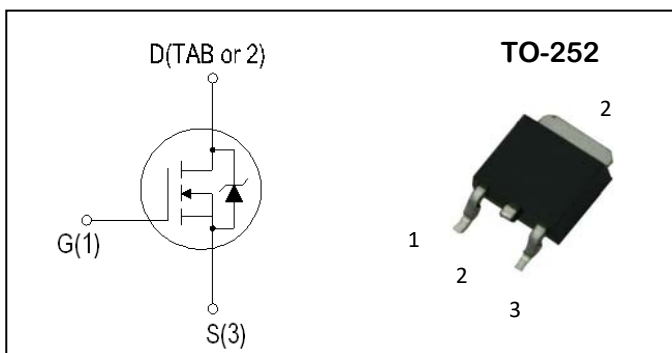
N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω)
60V	30A	26m Ω

Features:

- Low Gate Charge for Fast Switching Application
- Low $R_{DS(ON)}$ to Minimize Conductive Loss
- 100% EAS Guaranteed
- Optimized $V_{(BR)DSS}$ Ruggedness
- Lead-Free, RoHS Compliant



Description:

The ADM30N06E uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

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		± 20V	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current	T _C =25°C	25	A
Mounted on Large Heat Sink				
I _{DM}	300μs Pulse Drain Current Tested ⁽²⁾	T _C =25°C	70	A
I _D	Continuous Drain Current ⁽¹⁾	T _C =25°C	30	A
		T _C =100°C	17	A
P _D	Maximum Power Dissipation	T _C =25°C	50	W

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max ⁽¹⁾	3.0	$^\circ\text{C/W}$
R_{thJA}	Thermal resistance junction-ambient max ⁽¹⁾	70	$^\circ\text{C/W}$

Electrical Characteristics (TA=25°C Unless Otherwise Noted)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
On/off Characteristics						
V _{(BR)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 , T _J =25°C	--	--	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1	--	3.0	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} =15A	--	26	30	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V,	--	1890	--	pF
C _{OSS}	Output Capacitance	V _{DS} =30V,	--	168	--	
C _{rss}	Reverse Transfer Capacitance	Frequency=1MHz	--	132	--	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DS} =30V,	--	7	--	nS
t _r	Turn-on Rise Time	I _D = 2A, V _{GS} = 10V,	--	3.2	--	
t _{d(OFF)}	Turn-off Delay Time	R _{GEN} =3 Ω	--	19.2	--	
t _f	Turn-off Fall Time		--	3.2	--	
Q _g	Total Gate Charge	V _{DS} =48V, V _{GS} = 10V,	--	49	--	nC
Q _{gs}	Gate-Source Charge	I _{DS} =10A	--	8	--	
Q _{gd}	Gate-Drain Charge		--	16	--	
Avalanche Characteristics						
EAS	Single Pulse Avalanche Energy ⁽³⁾	L=0.5mH , V _{DS} =30V , R _{GEN} =25 Ω , V _{GS} = 10V	100	--	--	mJ
Diode Characteristics						
V _{SD}	Diode Forward Voltage ⁽²⁾	I _{SD} = 10A, V _{GS} = 0	--	--	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =10A, dI _{SD} /dt=100A/μs	--	35	--	ns
q _{rr}	Reverse Recovery Charge		--	43	--	nC

NOTES:

1. Surface Mounted on FR4 Board, t ≤ 10 sec.

2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%

3.The Min. value is 100% EAS tested guarantee.

Typical Performance Characteristics

Figure 1: On-Region Characteristics

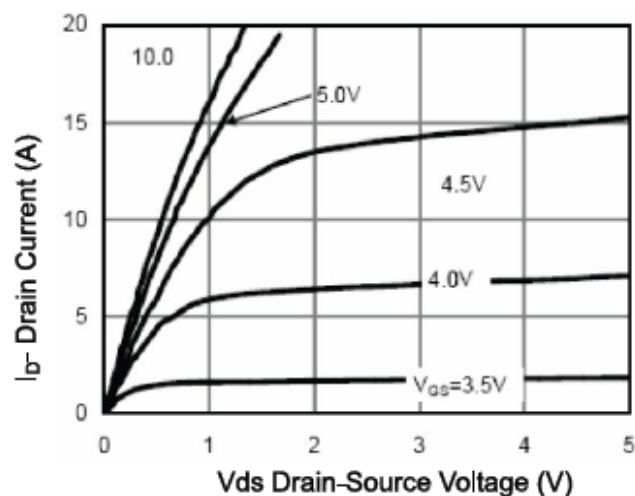


Figure 2: Transfer Characteristics

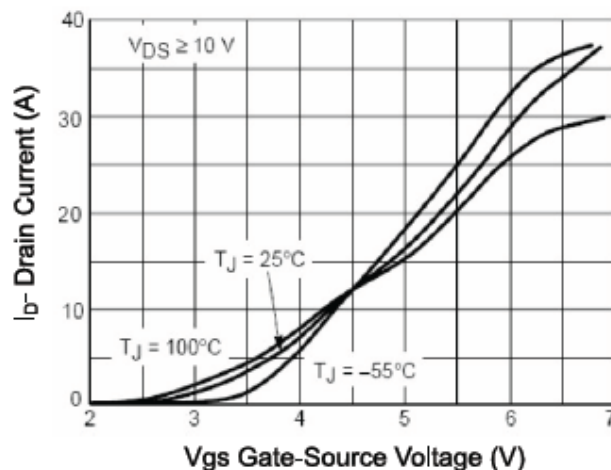


Figure 3: Rdson- Drain Current

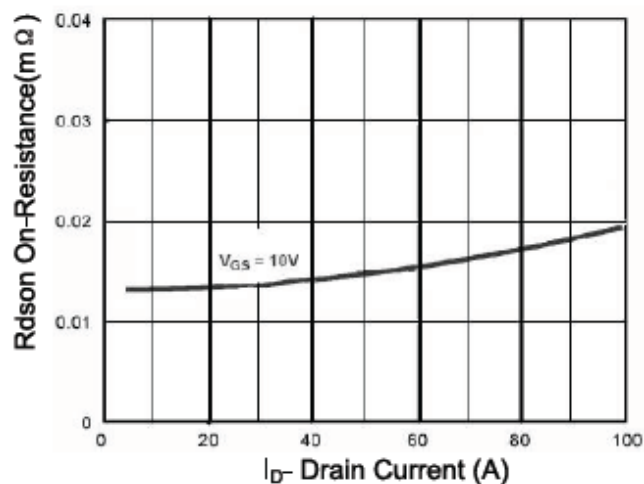


Figure 4: Rdson-JunctionTemperature

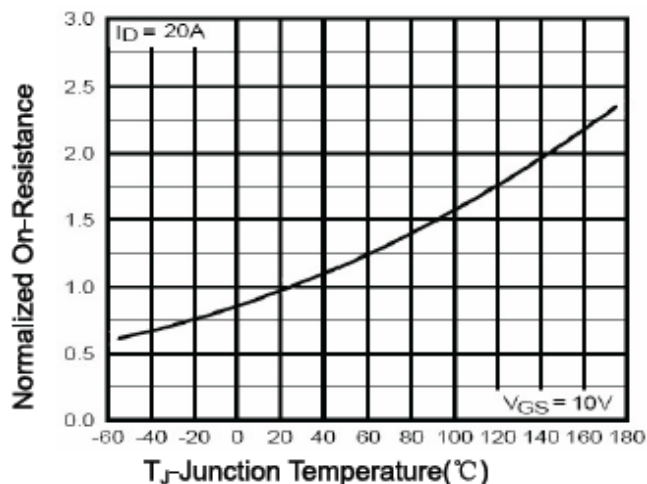


Figure 5: Source- Drain Diode Forward

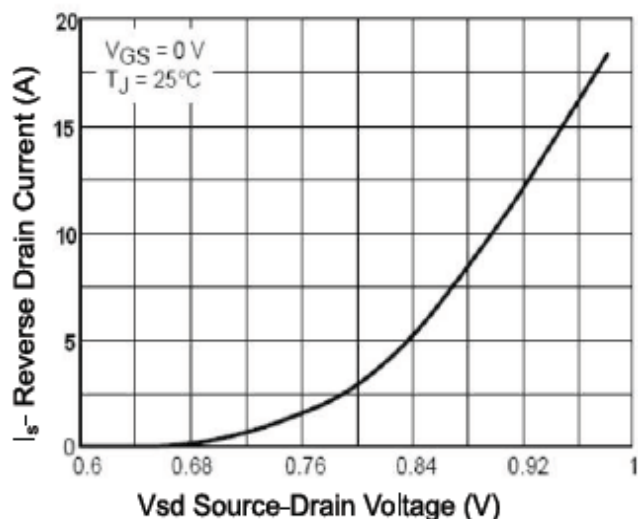


Figure 6: Gate Charge Characteristics

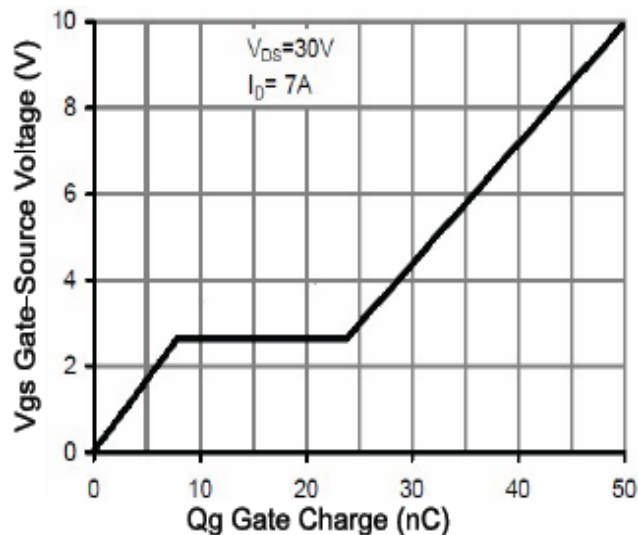


Figure 7: Capacitance vs Vds

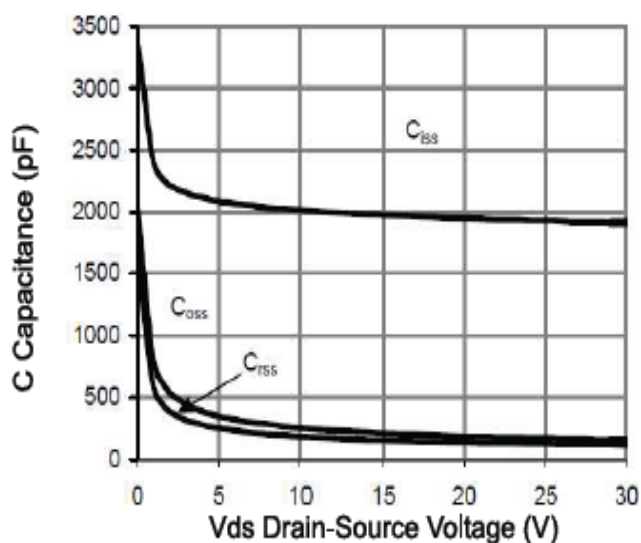


Figure 8: Safe Operation Area

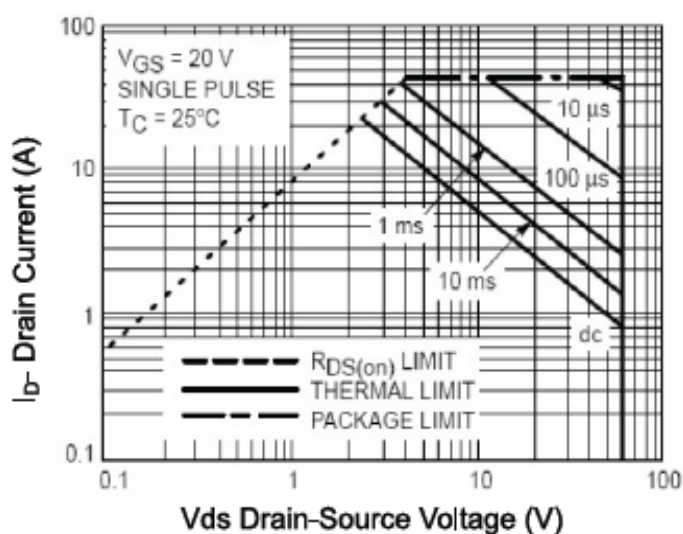


Figure 9: BV_{DSS} vs. Junction Temperature

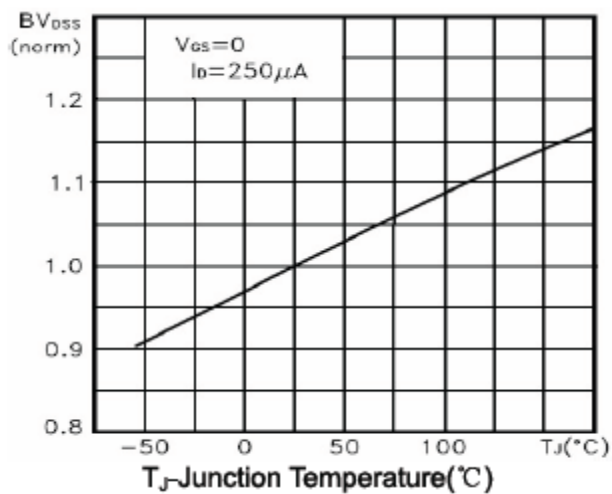


Figure 10: On-Resistance vs. Gate-Source Voltage

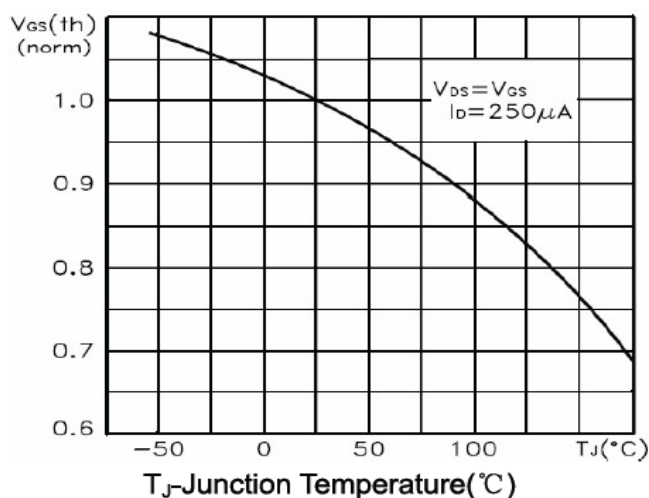
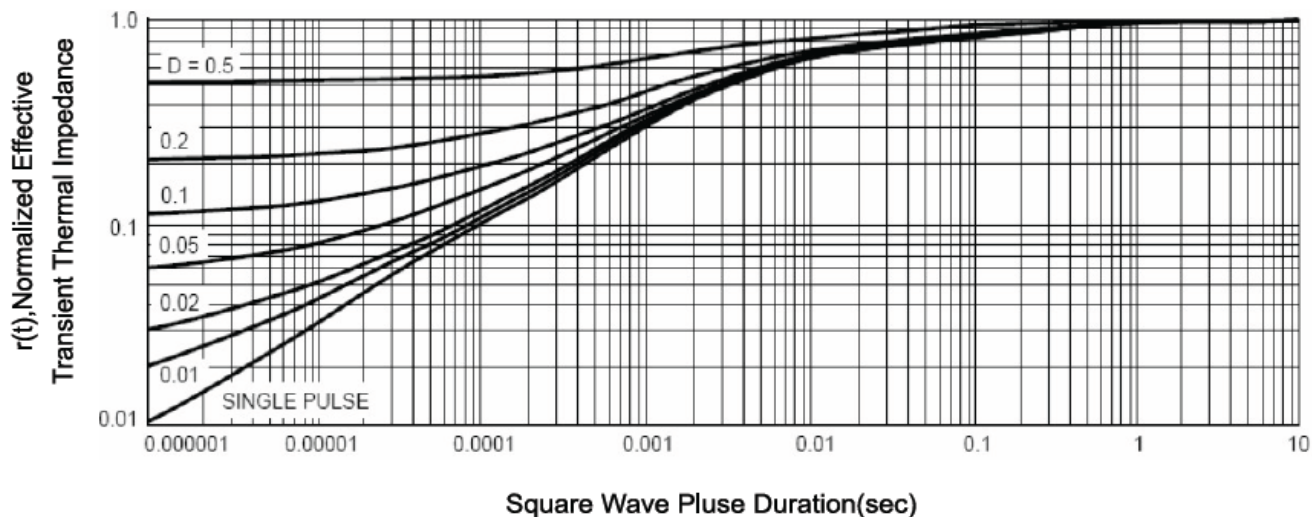
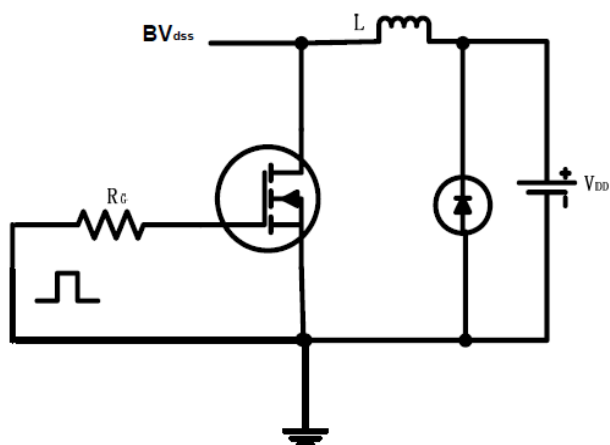


Figure 11: Normalized Maximum Transient Thermal Impedance

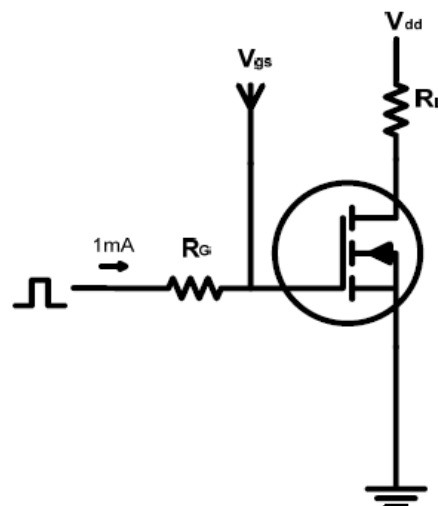


Test circuits and Waveforms

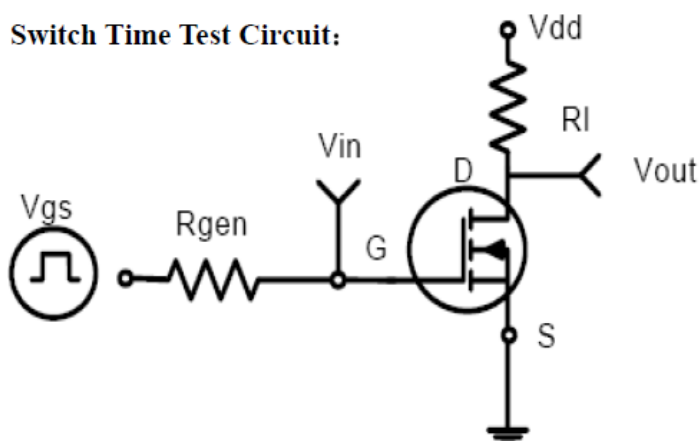
EAS test circuits:



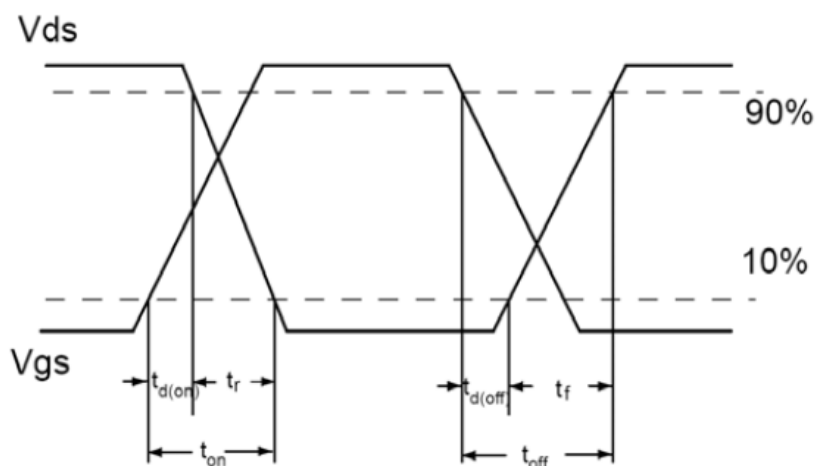
Gate charge test circuit:



Switch Time Test Circuit:

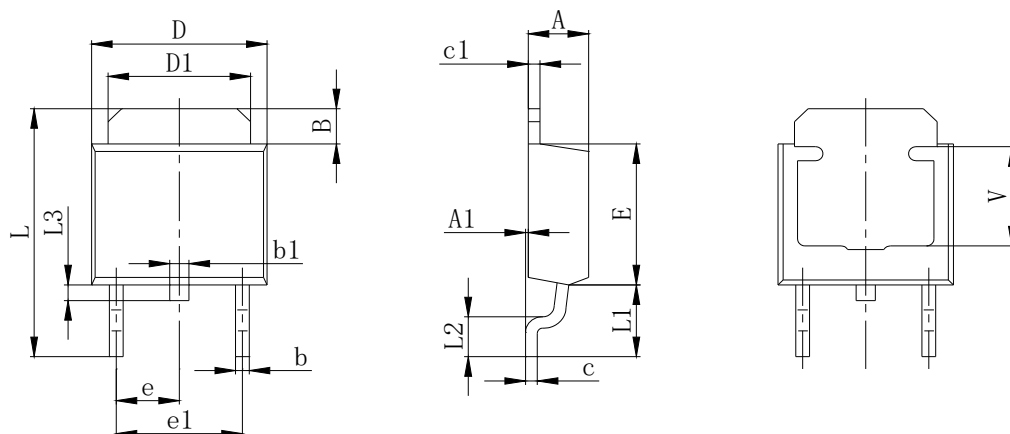


Switch Waveforms:



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.	