

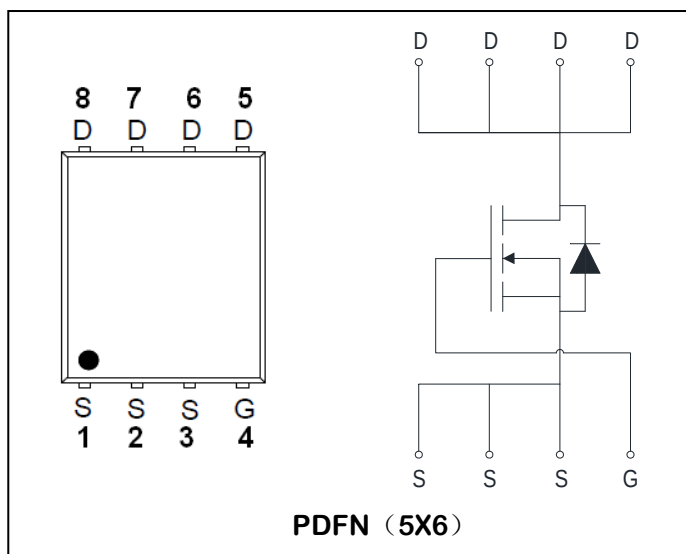
N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω)
60V	90A	3.5m 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 ADM90N06Q 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		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	90	A
Mounted on Large Heat Sink				
I _{DM}	300μs Pulse Drain Current Tested ⁽²⁾	T _C =25°C	360	A
I _D	Continuous Drain Current ⁽¹⁾	T _C =25°C	90	A
		T _C =100°C	63.6	A
P _D	Maximum Power Dissipation	T _C =25°C	100	W

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max ⁽¹⁾	1.25	$^\circ\text{C/W}$
R_{thJA}	Thermal resistance junction-ambient max ⁽¹⁾	35	$^\circ\text{C/W}$

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	VGS=0V, IDS=250uA	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=60V,VGS=0V , TJ=25°C	--	--	1	uA
VGS(th)	Gate Threshold Voltage	VDS=VGS, IDS=250uA	1	--	2.4	V
IGSS	Gate Leakage Current	VGS=±20V, VDS=0V	--	--	±100	nA
RDS(ON)	Drain-SourceOn-stateResistance ⁽²⁾	VGS= 10V, IDS=45A	--	--	3.5	mΩ
		VGS= 4.5V, IDS=45A	--	--	4.5	
Dynamic Characteristics						
Ciss	Input Capacitance	VGS=0V,	--	4000	--	pF
Coss	Output Capacitance	VDS=30V,	--	680	--	
Crss	Reverse Transfer Capacitance	Frequency=1MHz	--	23	--	
Switching Characteristics						
td(ON)	Turn-on Delay Time	VDS=30V,	--	11	--	nS
tr	Turn-on Rise Time	ID= 45A, VGS= 10V,	--	5	--	
td(OFF)	Turn-off Delay Time	RGEN=4.7 Ω	--	56	--	
tf	Turn-off Fall Time		--	12	--	
Qg	Total Gate Charge	VDS=30V, VGS= 10V,	--	67	--	nC
Qgs	Gate-Source Charge	IDS=45A	--	12	--	
Qgd	Gate-Drain Charge		--	8.5	--	
Avalanche Characteristics						
EAS	Single Pulse Avalanche Energy ⁽³⁾	L=0.5mH	500	--	--	mJ
Diode Characteristics						
VSD	Diode Forward Voltage ⁽²⁾	ISD = 45A, VGS = 0	--	--	1.2	V
trr	Reverse Recovery Time	ISD=90A, dISD/dt=100A/μs	--	48	--	ns
qrr	Reverse Recovery Charge		--	60	--	nC

NOTES:

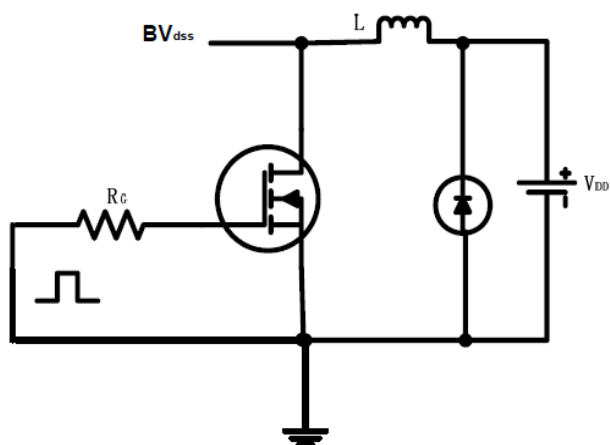
1. Surface Mounted on FR4 Board, t ≤ 10 sec.

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

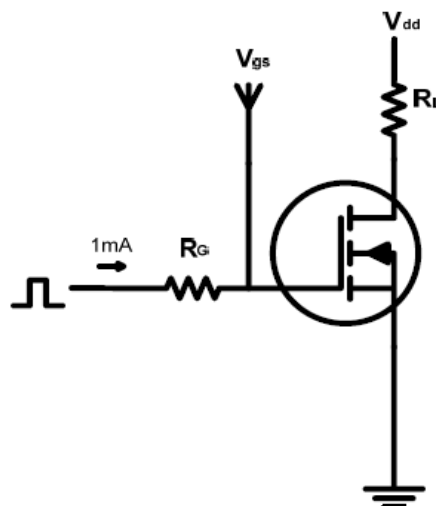
3. The Min. value is 100% EAS tested guarantee. Limited by T_{Jmax}, I_{AS} =22A, V_{DD} = 30V, R_G = 25Ω, Starting T_J = 25°C.

Test circuits and Waveforms

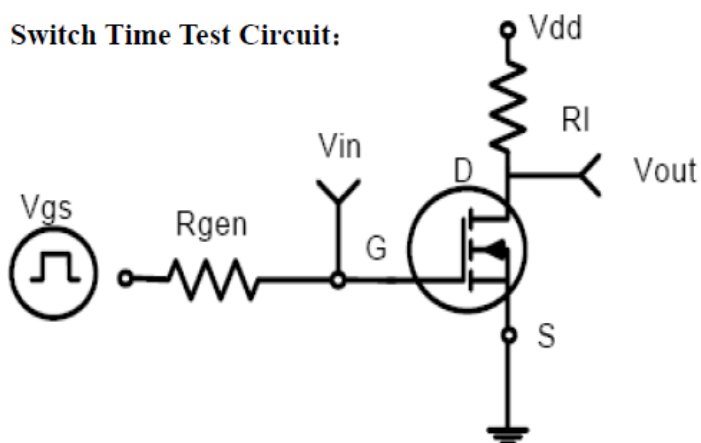
EAS test circuits:



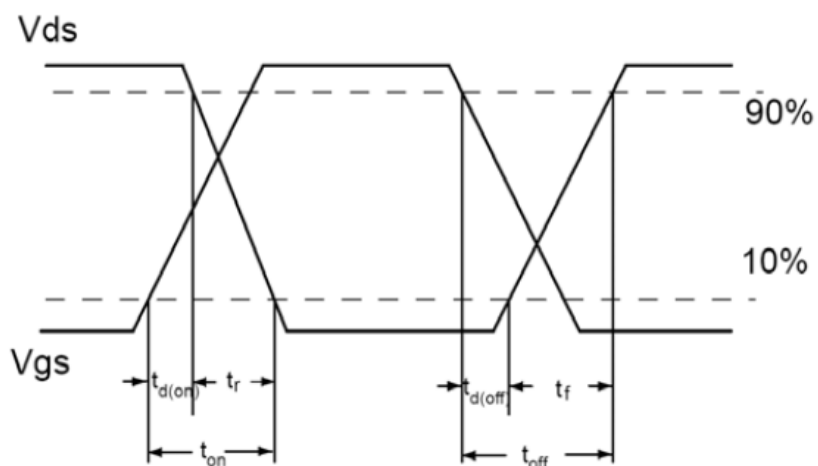
Gate charge test circuit:



Switch Time Test Circuit:

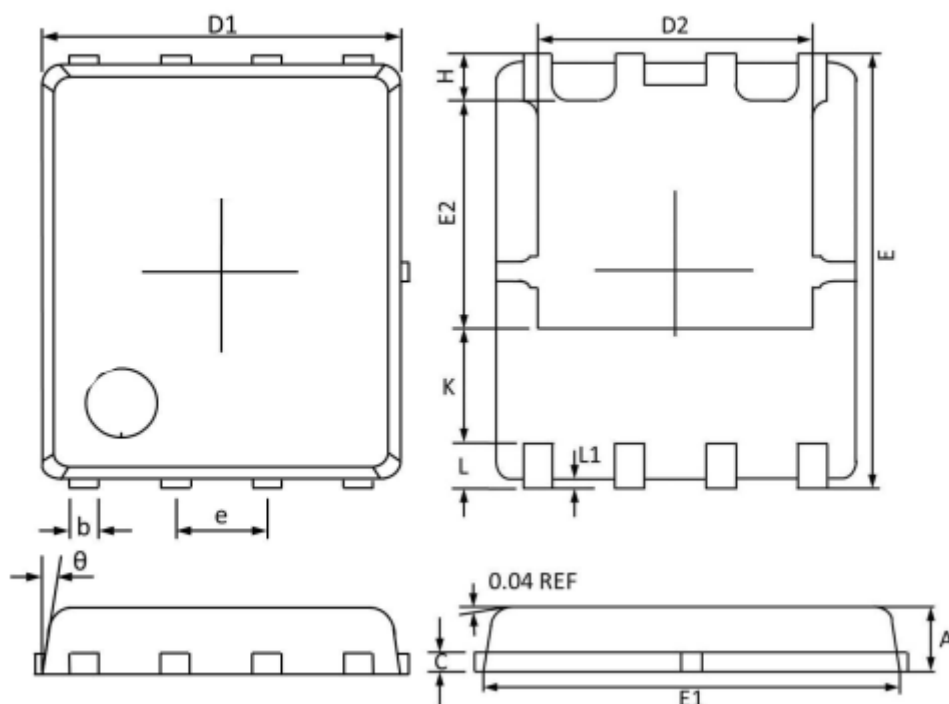


Switch Waveforms:



PACKAGE MECHANICAL DATA

PDFN (5X6) Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.043
b	0.330	0.510	0.013	0.020
c	0.200	0.300	0.008	0.012
D1	4.800	5.100	0.189	0.201
D2	3.610	4.100	0.142	0.161
E	5.900	6.200	0.232	0.244
E1	5.700	5.900	0.224	0.232
E2	3.350	3.780	0.132	0.149
H	0.410	0.700	0.016	0.028
K	1.100	1.500	0.043	0.059
e	1.270 TYP.		0.050 TYP.	
L	0.510	0.710	0.020	0.028
L1	0.060	0.200	0.002	0.008
θ	0°	12°	0°	12°