

N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V _{DSS}	ID	R _{DS(ON)} (mΩ)
100V	90A	3.8m Ω

Features:

- Low Gate Charge for Fast Switching Application
- Low RDS(ON) to Minimize Conductive Loss
- 100% EAS Guaranteed
- Optimized V(BR)DSS Ruggedness
- Lead-Free,RoHS Compliant



Description:

The ADM90N10Q 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 (TA = 25°C unless otherwise specifed)

Symbol	Parameter	Ratings	Unit			
Common R	Common Ratings					
V _{DSS}	Drain-Source Voltage		100	V		
V _{GSS}	Gate-Source Voltage		±20			
TJ	Maximum Junction Temperature		150	°C		
T _{STG}	Storage Temperature Range		-55 to150	°C		
ls	Diode Continuous Forward Current Tc =25°C		90	A		
Mounted on Large Heat Sink						
Ідм	300µs Pulse Drain Current Tested ⁽²⁾	T _C =25°C	360	A		
1-	Continuous Drain Current (1) Tc=25°C Tc=100°C	Tc=25°C	90	A		
		Tc=100°C	48	A		
Po	Maximum Power Dissipation	Tc=25°C	60	W		

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
RthJC	Thermal resistance junction-case max (1)	1.7	°C/W
RthJA	Thermal resistance junction-ambient max (1)	54.5	°C/W



ADM90N10Q

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
On/off Charac	cteristics	1	1	•	1	
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	100			V
ldss	Zero Gate Voltage Drain Current	V _{DS} =80V,V _{GS} =0V , T _J =25°C			10	uA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1.2		2.5	V
lgss	Gate Leakage Current	V_{GS} =±20V, V_{DS} =0V			±100	nA
Descar		V _{GS} = 10V, I _{DS} =50A		3.8	4.4	mΩ
RDS(ON)	Drain-SourceOn-stateResistance 2	V _{GS} = 4.5V, I _{DS} =200A		5.0	6.1	
Dynamic Chara	acteristics					
Ciss	Input Capacitance	V _{GS} =0V,		3694		
Coss	Output Capacitance	V _{DS} =50V,		617		pF
Crss	Reverse Transfer Capacitance	Frequency=1MHz		42		
Switching Cha	racteristics			•		·
td(ON)	Turn-on Delay Time	V _{DS} =50V,		13.7		
tr	Turn-on Rise Time	I _D = 45A, V _{GS} = 10V,		36		
td(OFF)	Turn-off Delay Time	R _{GEN} =3.6 Ω		54.4		ns
tr	Turn-off Fall Time			40.3		
Qg	Total Gate Charge	V _{DS} =50V, V _{GS} = 10V,		78		
Qgs	Gate-Source Charge	I _{DS} =30A		14.6		nC
Qgd	Gate-Drain Charge			21.4		
Avalanche Ch	aracteristics			•		
EAS	Single Pulse Avalanche Energy (3)		29			mJ
Diode Charact	eristics			•		
Vsd	Diode Forward Voltage (2)	I _{SD} = 20A, V _{GS} = 0		0.7	1.3	V
trr	Reverse Recovery Time			52		ns
Qrr	Reverse Recovery Charge	1 I _{SD} =20A, $dI_{SD}/dt=100A/\mu S$		70.6		nC

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

NOTES:

1. Surface Mounted on FR4 Board, t \leq 10 sec.

2.The data tested by pulsed , pulse width $~\leq~$ 300us , duty cycle $~\leq~$ 2%

3. The Min. value is 100% EAS tested guarantee. Limited by TJmax, L =0.1mH, V_{GS} = 10V, R_{G} = 50 Ω , Starting TJ = 25°C.



Typical Performance Characteristics





Figure 3: Rdson- Drain Current



Figure 5: Source- Drain Diode Forward





Figure 4: Drain-Source On Resistance



Figure 6: Gate Charge Characteristics





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Figure 7: Capacitance vs Vds

Figure 8: Safe Operation Area





Test circuits and Waveforms

EAS test circuits:



Gate charge test circuit:





Switch Waveforms:





PACKAGE MECHANICAL DATA PDFN (5X6) Package Dimension



Symb	Dimensions		Dimensions		
Symu	In Millimeters		In Inches		
01	Min.	Max.	Min.	Max.	
А	0.800	1.100	0.031	0.043	
b	0.330	0.510	0.013	0.020	
с	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	
Е	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	
Н	0.410	0.700	0.016	0.028	
K	1.100	1.500	0.043	0.059	
е	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°	

Ordering information

Part number	Package	Marking	Packing	Quantity
ADM90N10Q	PDFN5*6	M90N10Q	Embossed tape	2500pcs



ADM90N10Q

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