

**Feature**

- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

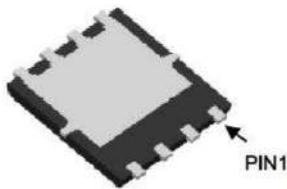
Product Summary

V_{DS}	20	V
$R_{DS(on),TYP} @ V_{GS}=10V$	1.5	m Ω
$R_{DS(on),TYP} @ V_{GS}=4.5V$	1.8	m Ω
I_D	90	A

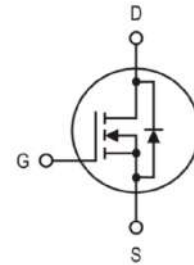
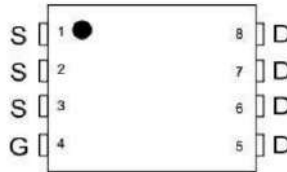
Application

- Power Management in Inverter System

top view



PDFN5*6-8

**Maximum ratings, at $T_A=25\text{ }^\circ\text{C}$, unless otherwise specified**

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source breakdown voltage	20	V
I_S	Diode continuous forward current	$T_C=25^\circ\text{C}$ 90	A
I_D	Continuous drain current @ $V_{GS}=10V$ ①	$T_C=25^\circ\text{C}$ 90	A
		$T_C=100^\circ\text{C}$ 75	A
I_{DM}	Pulse drain current tested	$T_A=25^\circ\text{C}$ 360	A
EAS	Avalanche energy, single pulsed ②	105	mJ
P_D	Maximum power dissipation	$T_C=25^\circ\text{C}$ 40	W
V_{GS}	Gate-Source voltage	± 20	V
MSL		Level 3	
T_{STG}, T_J	Storage and junction temperature range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.9	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	35	$^\circ\text{C/W}$



Typical Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _J =25°C)	V _{DS} =20V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _J =125°C)	V _{DS} =20V, V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.5	0.75	1.1	V
R _{DS(ON)}	Drain-Source On-State Resistance ③	V _{GS} =10V, I _D =30A	--	1.5	2.5	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ③	V _{GS} =4.5V, I _D =20A	--	1.8	2.8	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ③	V _{GS} =2.5V, I _D =20A	--	2.8	4	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz		3605		pF
C _{oss}	Output Capacitance			490		pF
C _{rss}	Reverse Transfer Capacitance			365		pF
R _g	Gate Resistance	f=1MHz	--	2.4	--	Ω
Q _g	Total Gate Charge	V _{DS} =10V, I _D =15A, V _{GS} =10V	--	36.6	--	nC
Q _{gs}	Gate-Source Charge		--	6.07	--	nC
Q _{gd}	Gate-Drain Charge		--	13.8	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =10V, I _D =20A, R _G =1.5Ω, V _{GS} =6V	--	11.2	--	nS
t _r	Turn-on Rise Time		--	49	--	nS
t _{d(off)}	Turn-Off Delay Time		--	35	--	nS
t _f	Turn-Off Fall Time		--	7.8	--	nS
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =2A, V _{GS} =0V	--	0.8	1.2	V
t _{rr}	Reverse Recovery Time	T _J =25°C, I _{SD} =10A, V _{GS} =0V	--	20	--	nS
Q _{rr}	Reverse Recovery Charge	di/dt=500A/μs		11.5		nC

NOTE:

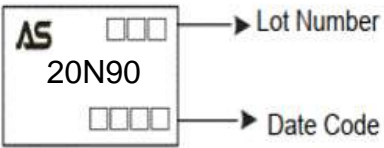
① This characteristics assumes the die are assembled in PDFN5*6-8 packages. Actual performance may degrade when assembled. Ascend does not guarantee device performance after assembly.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.1mH, R_G = 25Ω, I_{AS} = 42A, V_{GS} = 6V. Part not recommended for use above this value.

③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

Ordering and Marking Information

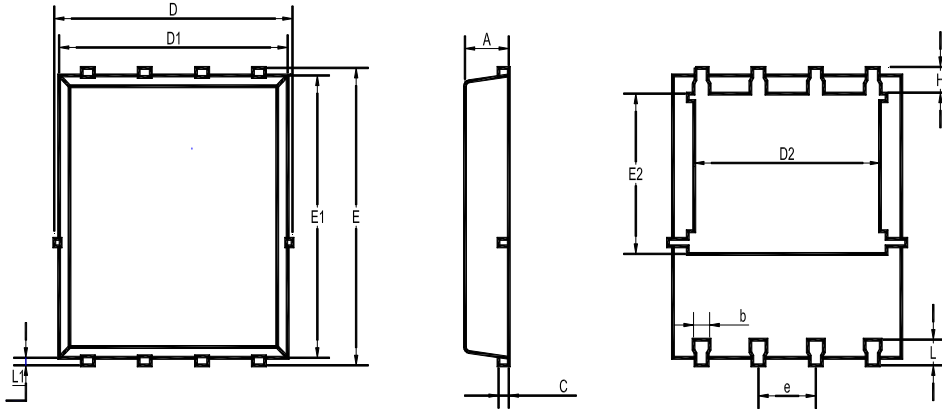
Ordering Device No.	Marking	Package	Packing	Quantity
ASDM20N90Q-R	20N90	PDFN5*6-8	Tape&Reel	4000/Reel

PACKAGE	MARKING
PDFN5*6-8	 <p>AS □□□ → Lot Number 20N90 □□□□ → Date Code</p>



Package Outline Dimensions (Units: mm)

PDFN5*6-8



UNIT	A	b	C	D	D1	D2	E	E1	E2	e	L	L1	H
mm	1.12	0.51	0.34	5.26	5.1	4.5	6.25	6	3.66	1.37	0.71	0.2	0.71
	0.9	0.33	0.11	4.7	4.7	3.56	5.75	5.6	3.18	1.17	0.35	0.06	0.35

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