

Features

- Advanced Trench Technology
- Excellent $R_{DS(on)}$ and Low Gate Charge
- Lead free product is acquired

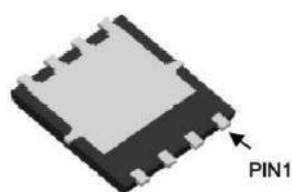
Application

- Load Switch
- PWM Application
- Power management

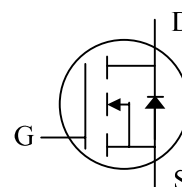
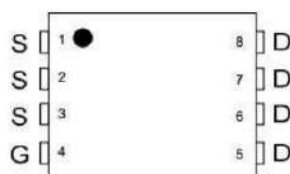
Product Summary



V_{DS}	20	V
$R_{DS(on),Max}@ V_{GS}=4.5V$	11.2	mΩ
I_D	16	A



PDFN3.3x3.3-8



Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		± 12	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	16	A
		$T_C = 100^\circ\text{C}$	20	A
I_{DM}	Pulsed Drain Current ^{note1}		64	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}		23	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	20	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		7.5	$^\circ\text{C}/\text{W}$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	$^\circ\text{C}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.5	-	1.2	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =4.5V, I _D =15A	-	-	11.2	mΩ
		V _{GS} =2.5V, I _D =10A	-	-	17.5	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1.0MHz	-	1000	-	pF
C _{oss}	Output Capacitance		-	182	-	pF
C _{rss}	Reverse Transfer Capacitance		-	164	-	pF
Q _g	Total Gate Charge	V _{DS} =10V, I _D =15A, V _{GS} =4.5V	-	15	-	nC
Q _{gs}	Gate-Source Charge		-	2	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	5.2	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =10V, I _D =15A, R _{GEN} =3Ω, V _{GS} =4.5V	-	9	-	ns
t _r	Turn-on Rise Time		-	25	-	ns
t _{d(off)}	Turn-off Delay Time		-	37	-	ns
t _f	Turn-off Fall Time		-	14	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	16	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	64	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=10V$, $V_G=4.5V$, $L=0.5mH$, $R_G=25\Omega$, $I_{AS}=9.6A$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Performance Characteristics

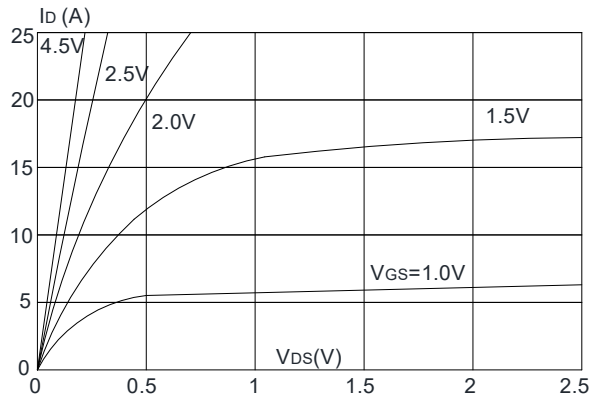
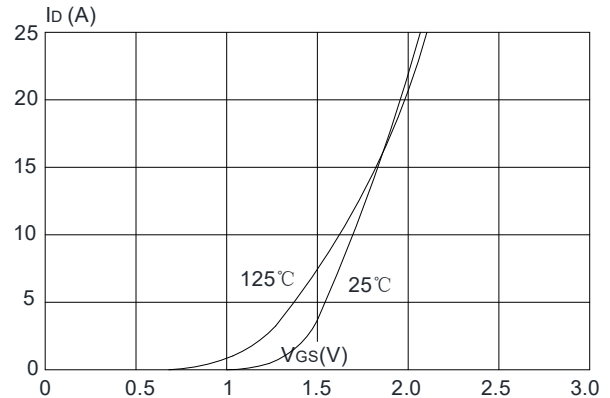
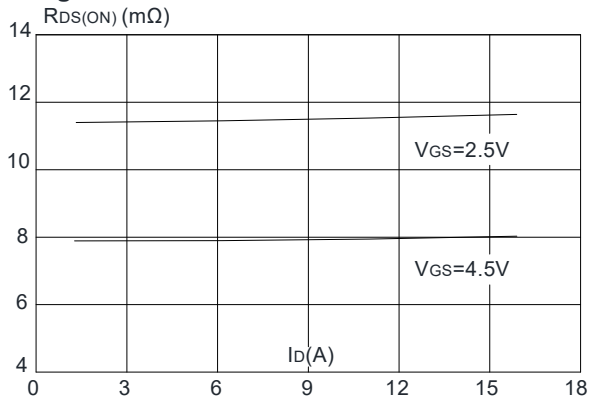
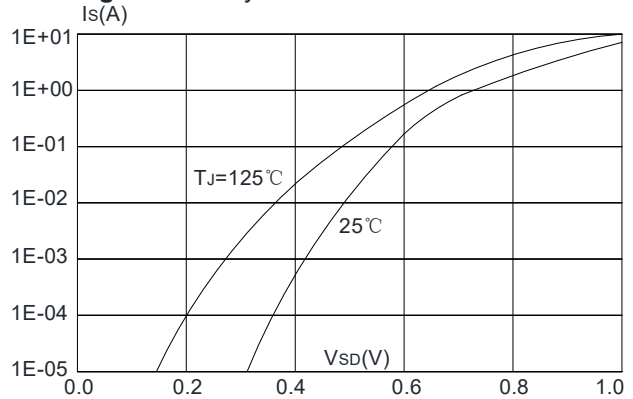
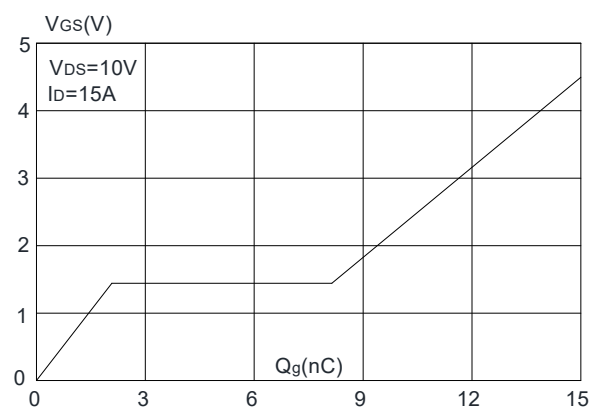
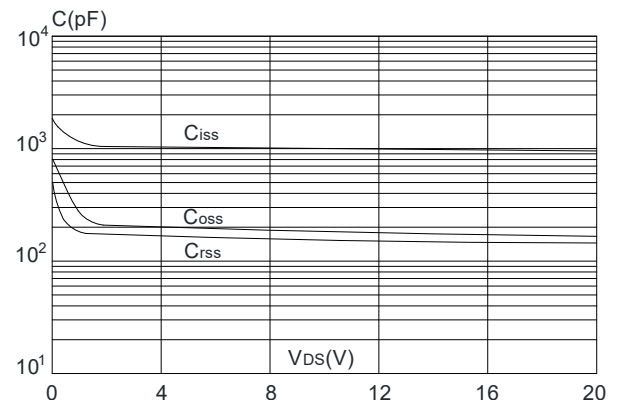
Figure1: Output Characteristics

Figure 2: Typical Transfer Characteristics

Figure 3: On-resistance vs. Drain Current

Figure 4: Body Diode Characteristics

Figure 5: Gate Charge Characteristics

Figure 6: Capacitance Characteristics


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

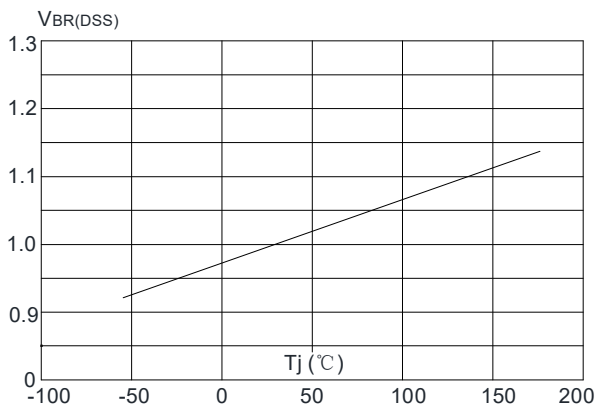


Figure 8: Normalized on Resistance vs. Junction Temperature

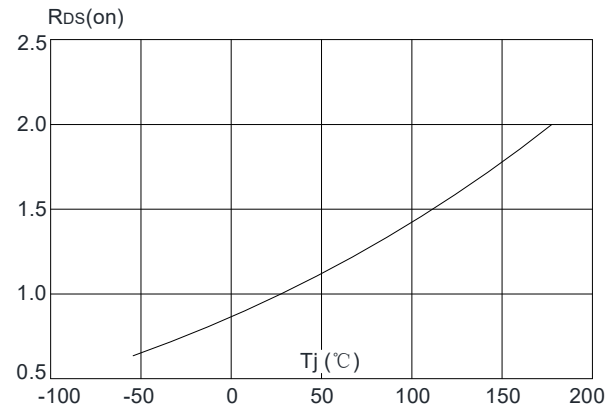


Figure 9: Maximum Safe Operating Area

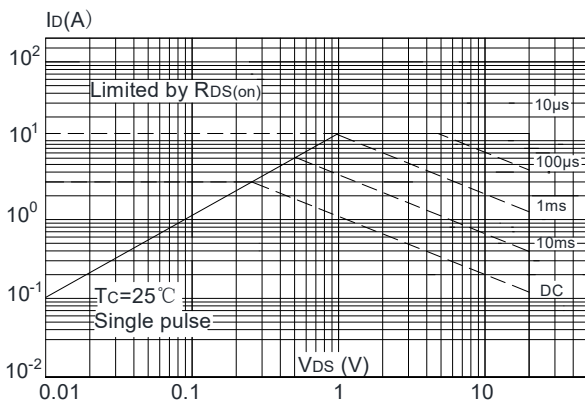


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

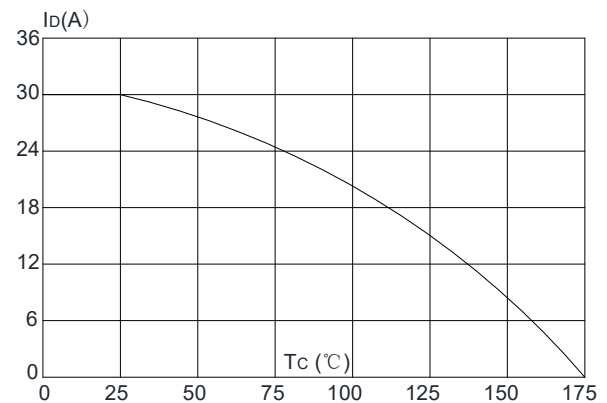
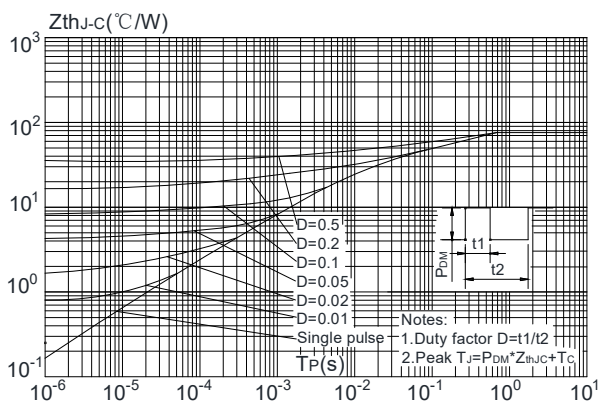


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

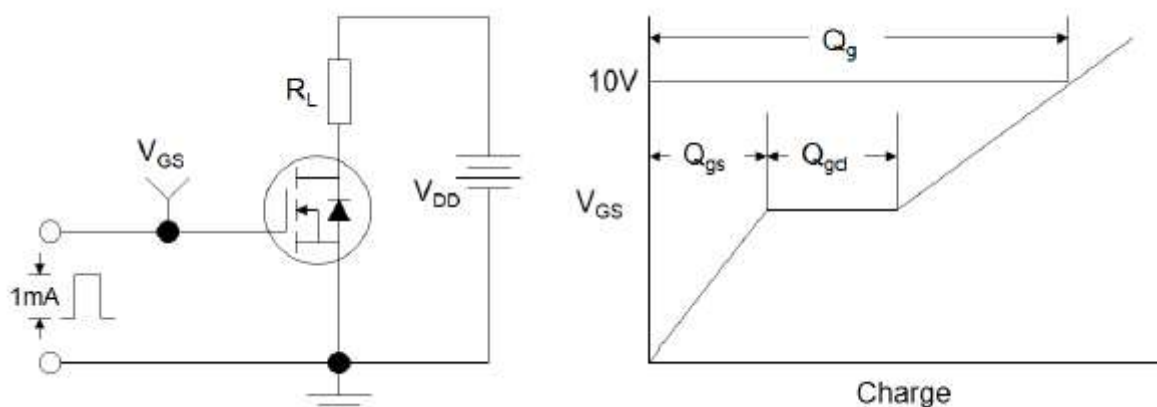


Figure1:Gate Charge Test Circuit & Waveform

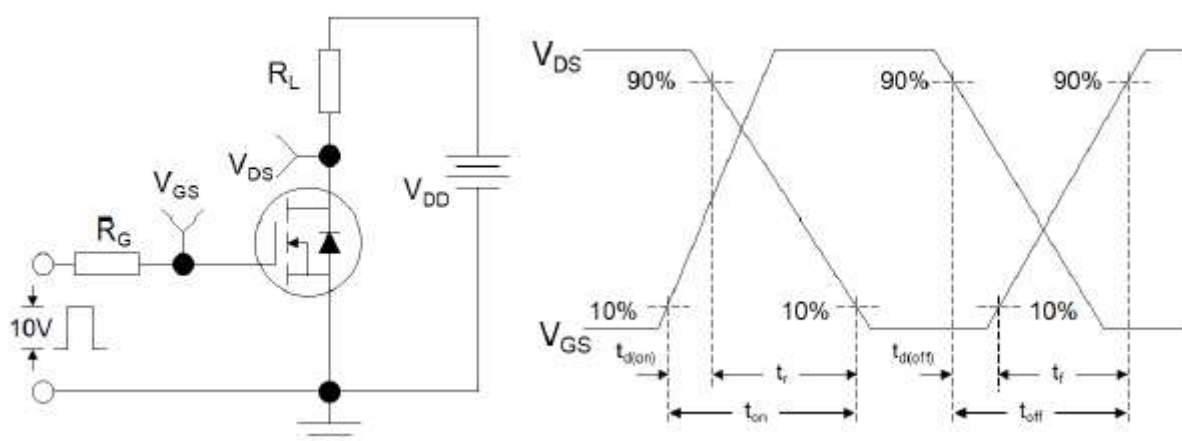


Figure 2: Resistive Switching Test Circuit & Waveforms

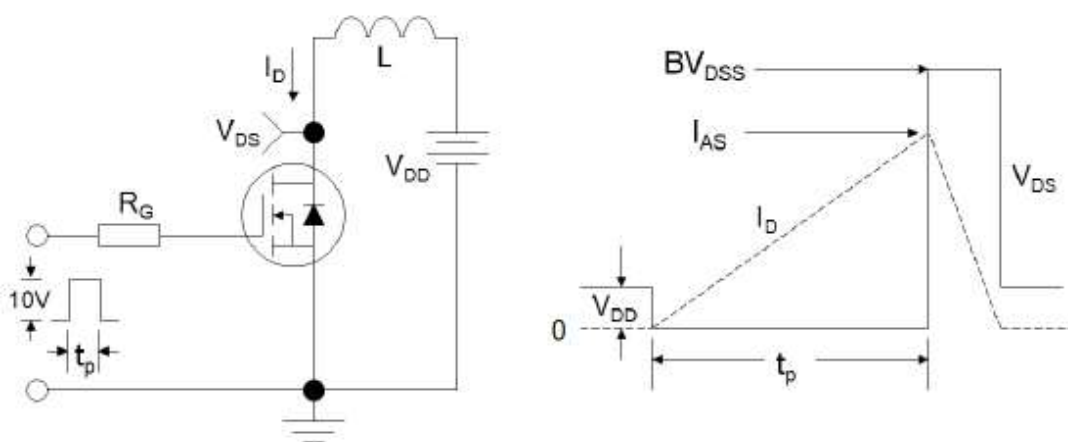
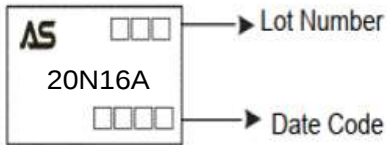
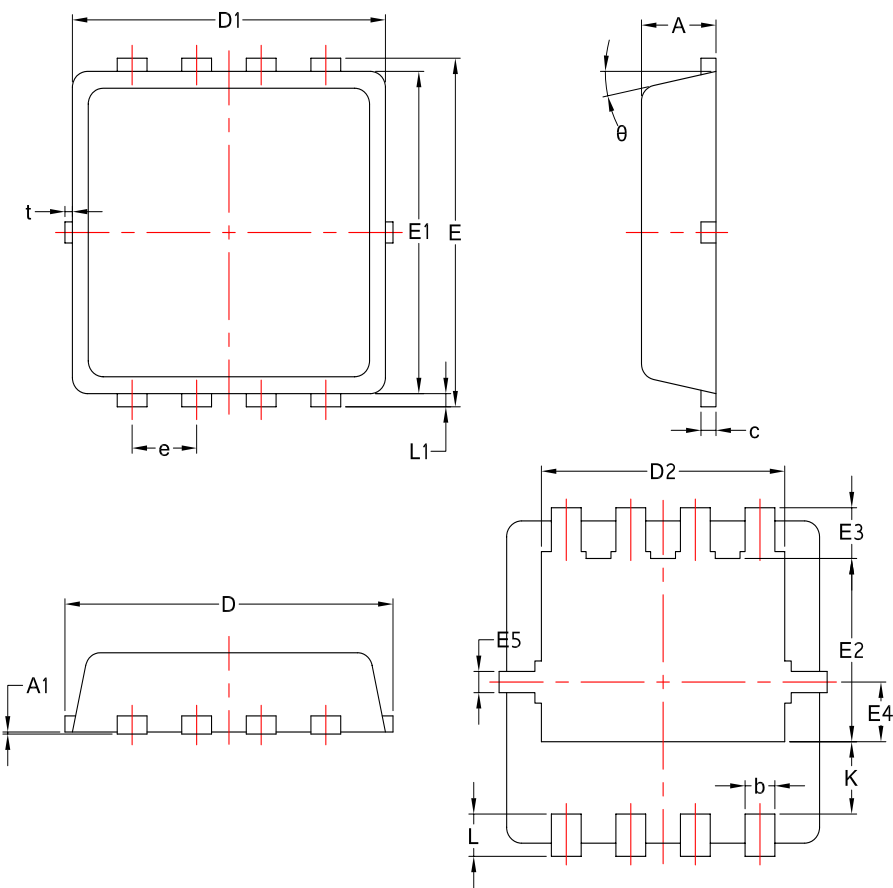


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM20N16AE-R	20N16A	PDFN3.3x3.3-8	Tape&Reel	5000/Reel

PACKAGE	MARKING
PDFN3.3x3.3-8	 AS □□□ → Lot Number 20N16A □□□□ → Date Code



S Y M B O L	COMMON		
	MM		
	MIN	NOM	MAX
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
△2 D1	3.00	3.15	3.25
△2 D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
△3 E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
△2 K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
△2 t	0	0.075	0.13
△2 θ	10°	12°	14°

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