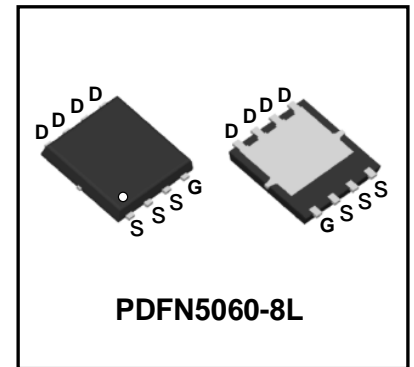# WMB043N10LGS

100V N-Channel Enhancement Mode Power MOSFET

Description

WMB043N10LGS uses Wayon's advanced power trench MOSFET technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance. This device is well suited for high efficiency fast switching applications.
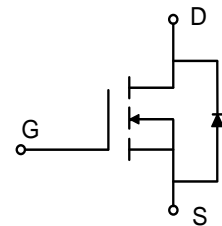
PDFN5060-8L

Features

- V_{DS}= 100V, I_D = 120A

  $R_{DS(on)}$ < 4.5mΩ @ V_{GS} = 10V

  $R_{DS(on)}$ < 6.7mΩ @ V_{GS} = 4.5V
- Green Device Available
- Low Gate Charge
- 100% EAS Guaranteed

Applications

- DC/DC Converter
- Power Management Switches

Absolute Maximum Ratings（T_A = 25°C, unless otherwise noted）

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	120	A
	T_C=100°C		76	
Pulsed Drain Current[1]		I_{DM}	480	A
Single Pulse Avalanche Energy[2]		EAS	320	mJ
Total Power Dissipation	T_C=25°C	P_D	131.6	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient[3]	$R_{\theta JA}$	48	°C/W
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	0.95	°C/W

Electrical Characteristics（T_J = 25°C, unless otherwise noted）

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250µA	100	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS} =100V, V_{GS} = 0V	-	-	1	µA
	T_J=100°C			-	-	100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1.2	1.8	2.5	V
Drain-Source on-Resistance[4]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A	-	3.6	4.5	mΩ
			V_{GS} = 4.5V, I_D = 15A	-	5.2	6.7	
Forward Transconductance[4]		g_{fs}	V_{DS} = 10V, I_D = 20A	-	70	-	S
Dynamic Characteristics[5]							
Input Capacitance		C_{iss}	V_{DS} = 50V, V_{GS} =0V, f =1MHz	-	5475	-	pF
Output Capacitance		C_{oss}		-	768	-	
Reverse Transfer Capacitance		C_{rss}		-	22	-	
Gate Resistance		R_g	f =1MHz	-	1.3	-	Ω
Switching Characteristics[5]							
Total Gate Charge		Q_g	V_{GS} = 10V, V_{DS} = 50V, I_D=20A	-	111.2	-	nC
Gate-Source Charge		Q_{gs}		-	17.5	-	
Gate-Drain Charge		Q_{gd}		-	30.2	-	
Turn-on Delay Time		$t_{d(on)}$	V_{GS} =10V, V_{DD} =50V, R_G = 3Ω, I_D= 20A	-	22.2	-	ns
Rise Time		t_r		-	37.8	-	
Turn-off Delay Time		$t_{d(off)}$		-	95.2	-	
Fall Time		t_f		-	35.6	-	
Body Diode Reverse Recovery Time		t_{rr}	I_F = 20A, dI/dt=100A/µs	-	59.4	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}		-	91.8	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[4]		V_{SD}	I_S = 20A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current	T_C=25°C	I_S	-	-	-	120	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

2. The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.4mH, I_{AS}=40A

3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper,The value in any given application depends on the user's specific board design.

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

5. This value is guaranteed by design hence it is not included in the production test.
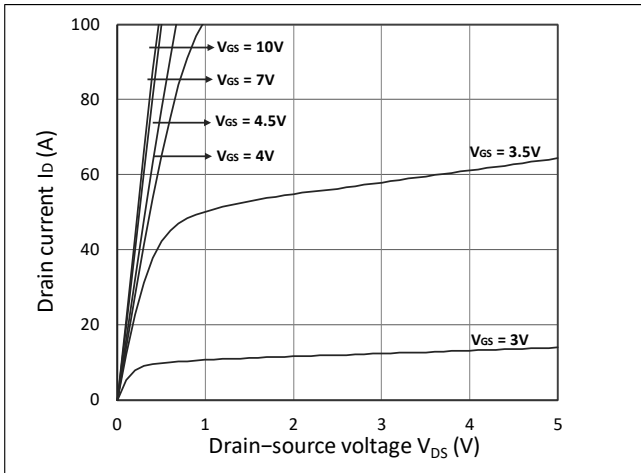
Typical Characteristics

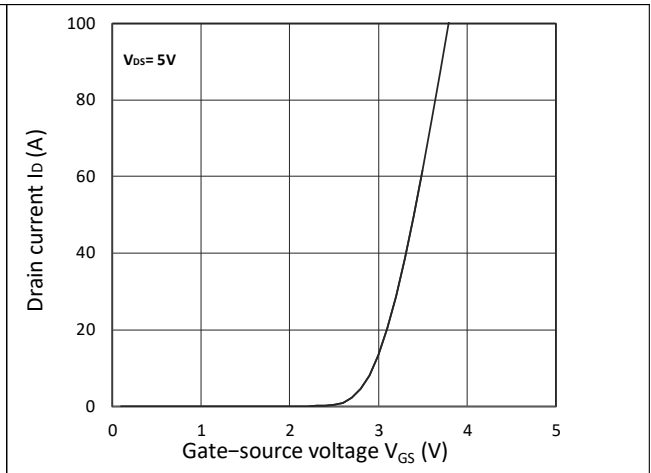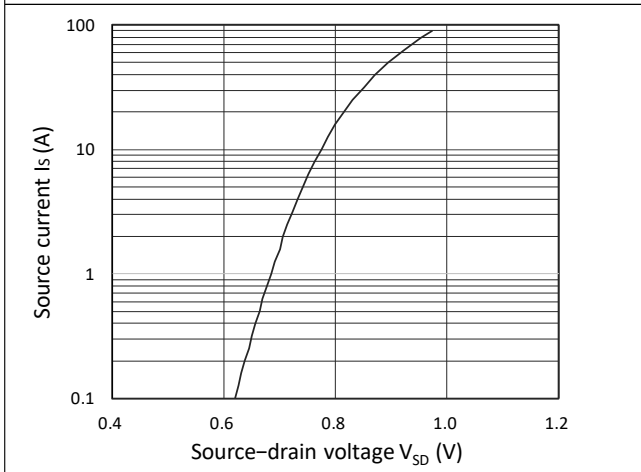Figure 1. Output Characteristics

Figure 2. Transfer Characteristics

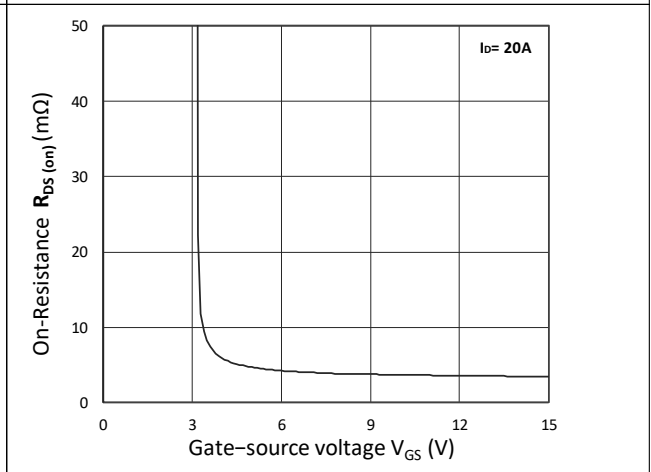

Figure 3. Forward Characteristics of Reverse

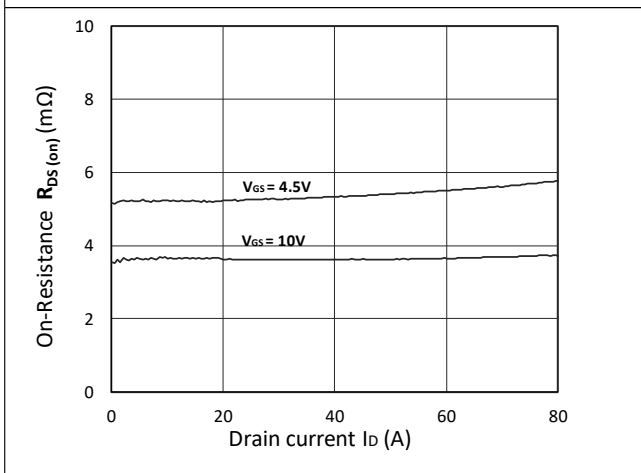Figure 4. $R_{DS(ON)}$ vs. V_{GS}

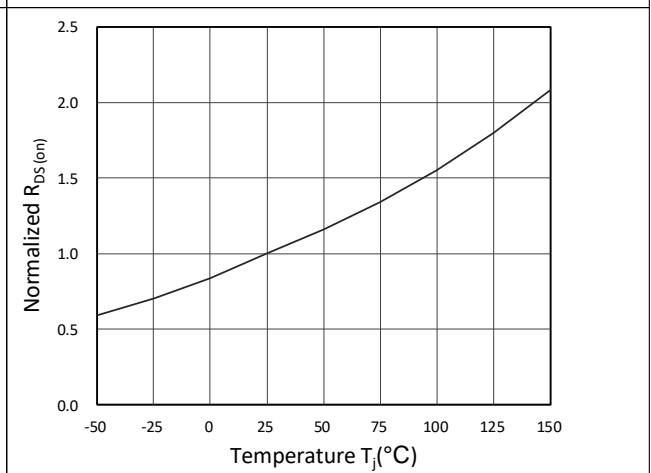Figure 5. $R_{DS(ON)}$ vs. I_D

Figure 6. Normalized $R_{DS(on)}$ vs. Temperature
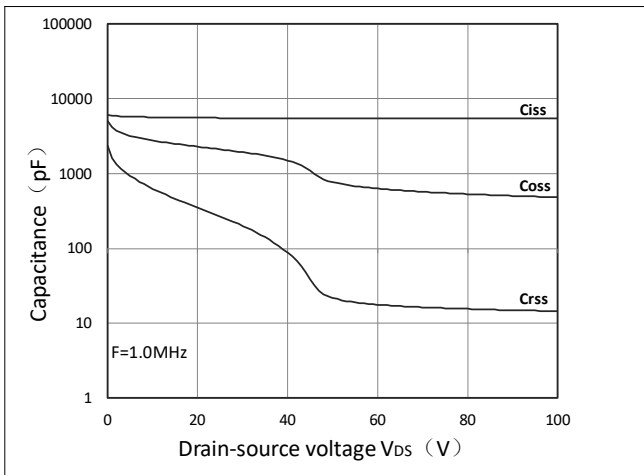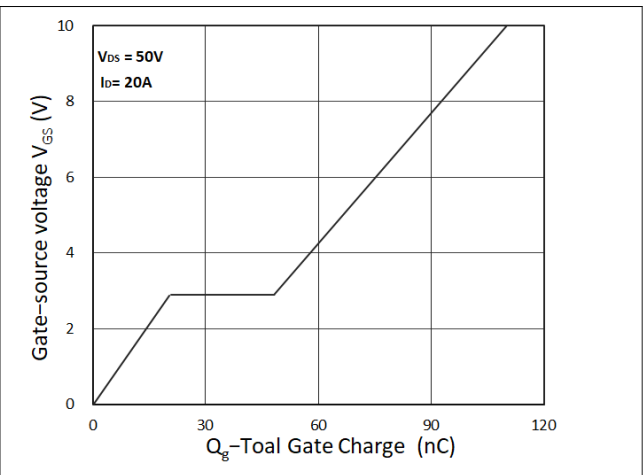
Figure 7. Capacitance Characteristics

Figure 8. Gate Charge Characteristics

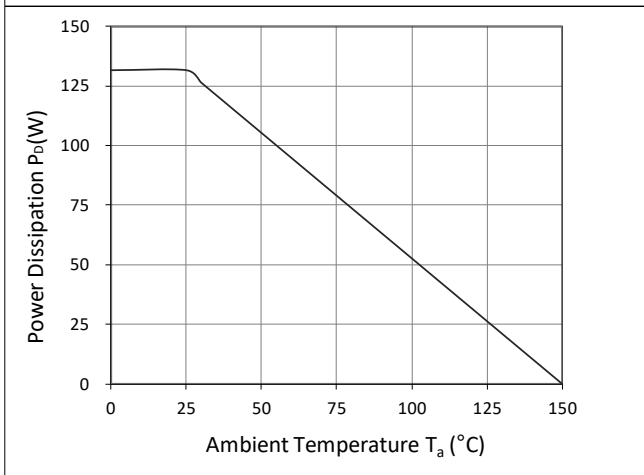Figure 9. Power Dissipation
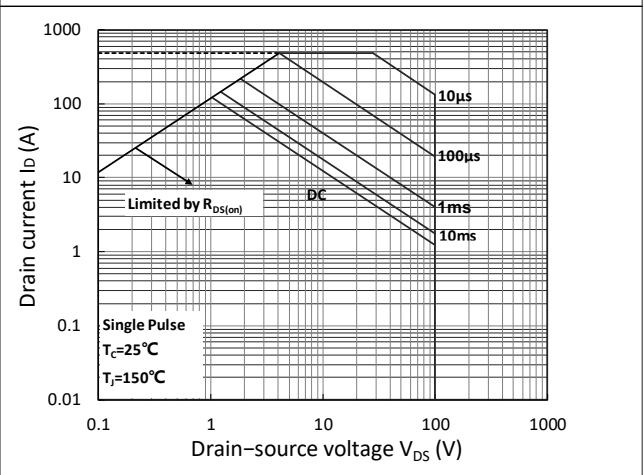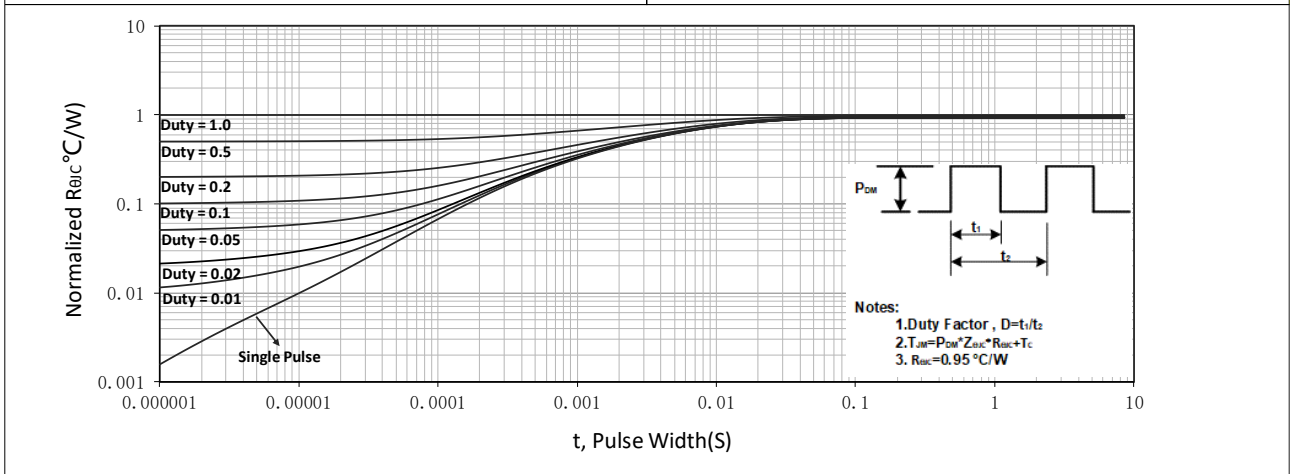

Figure10. Safe Operating Area

Figure 11. Normalized Maximum Transient Thermal Impedance
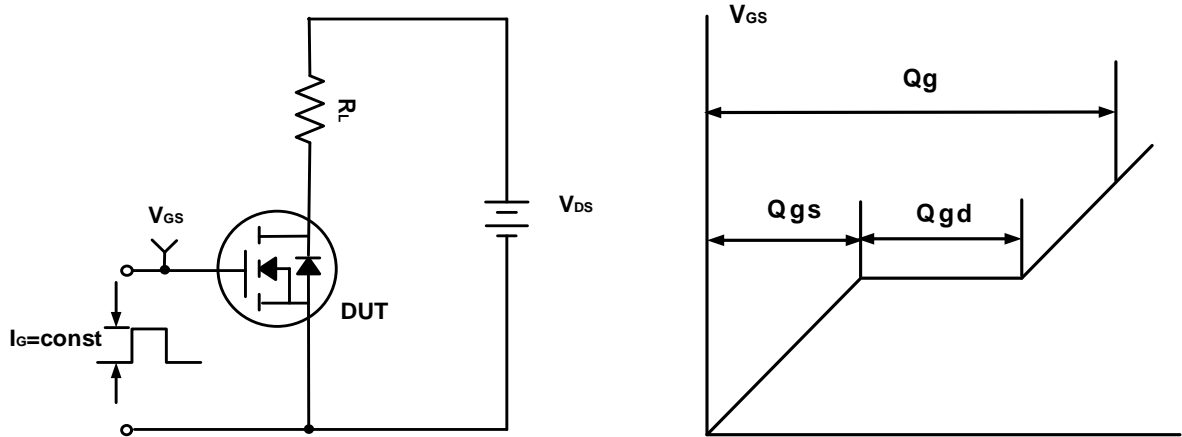
Test Circuit

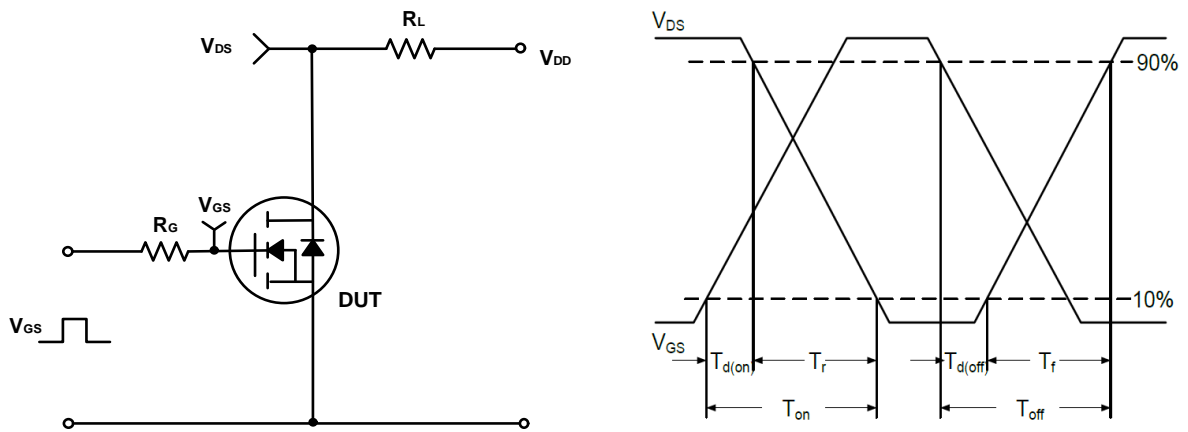**Figure A. Gate Charge Test Circuit & Waveforms**

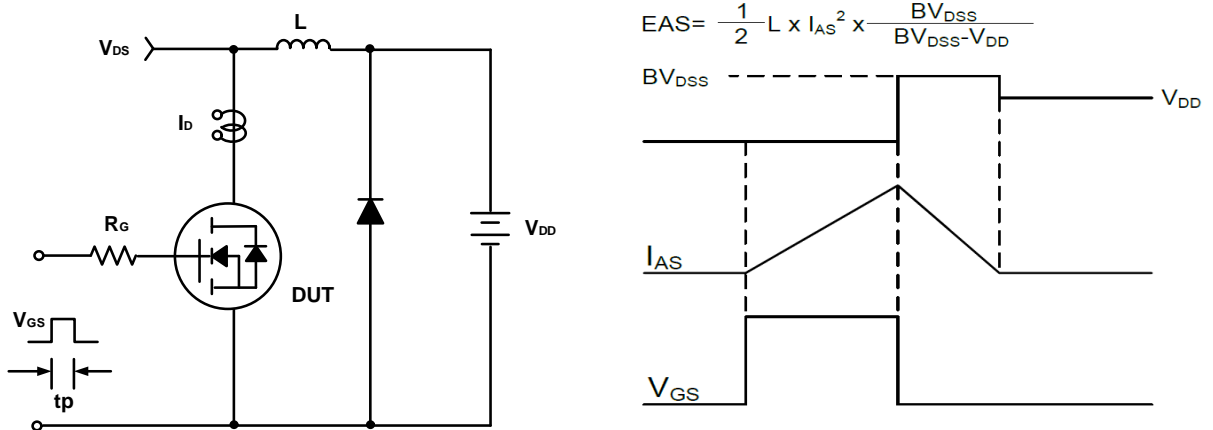**Figure B. Switching Test Circuit & Waveforms**

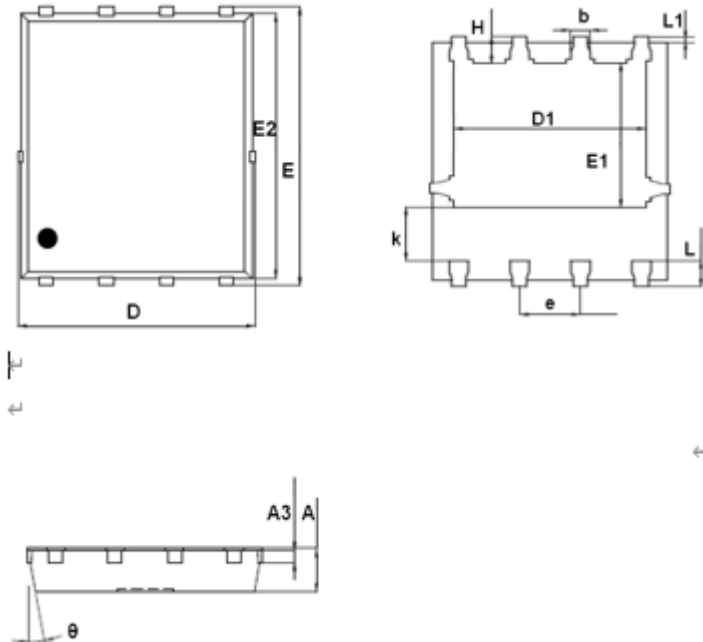$$EAS= \frac{1}{2}L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for PDFN5060-8L

COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	0.90	1.20
A3	0.15	0.35
D	4.80	5.40
E	5.90	6.35
D1	3.61	4.31
E1	3.30	3.92
E2	5.50	6.06
k	1.10	-
b	0.30	0.51
e	1.27BSC	
L	0.38	0.71
L1	0.05	0.36
H	0.38	0.71
θ	0°	12°

Ordering Information

Part	Package	Marking	Packing method
WMB043N10LGS	PDFN5060-8L	043N10LS	Tape and Reel

Marking Information

```
 ┌─────────────┐
 │             │
 │   Wayon     │
 │  043N10LS   │
 │  WWXX XXX   │
 │  ●          │
 └─────────────┘
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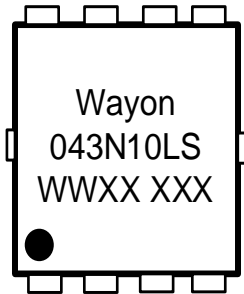
043N10LS = Device code

WWXX XXX= Date code

Contact Information

No.1001, Shiwan(7) Road, Pudong District, Shanghai, P.R.China.201207
Tel: 86-21-50310888 Fax: 86-21-50757680 Email: market@way-on.com
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DMN1017UCP3-7 EFC2J004NUZTDG P85W28HP2F-7071 DMN1053UCP4-7 NTE2384 DMC2700UDMQ-7 DMN2080UCB4-7

DMN61D9UWQ-13 US6M2GTR DMN31D5UDJ-7 DMP22D4UFO-7B IPS60R3K4CEAKMA1 DMN1006UCA6-7 DMN16M9UCA6-7

STF5N65M6 IRF40H233XTMA1 STU5N65M6 DMN6022SSD-13 DMN13M9UCA6-7 DMTH10H4M6SPS-13 IPS60R360PFD7SAKMA1

DMN2990UFB-7B SSM3K35CT,L3F IPLK60R1K0PFD7ATMA1 2N7002W-G MCAC30N06Y-TP IPWS65R035CFD7AXKSA1

MCQ7328-TP SSM3J143TU,LXHF DMN12M3UCA6-7 PJMF280N65E1_T0_00201 PJMF380N65E1_T0_00201

PJMF280N60E1_T0_00201 PJMF600N65E1_T0_00201 PJMF900N65E1_T0_00201