



# NEW PRODUCTS INTRODUCTION

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MOTIEN TECHNOLOGY CO., LTD

# NL1 HIGHLIGHT COMPARED WITH THE EXISTING PRODUCTS.



	MOTIEN NL1	MOTIEN VA-H	MOTIEN VAP-H
Package & Dimensions	SIP4 0.46"x 0.24"x 0.4"	SIP4 0.46"x 0.24"x 0.4"	SIP4 0.46"x 0.24"x 0.4"
Pinout Compatibility	Compatible	Compatible	Compatible
Output	Unregulated Single Output	Unregulated Single Output	Unregulated Single Output
Load Regulation	<b>±10% ~ ±15% by model (10%~100% Load )</b>	±10% ~ ±20% by model (20%~100% Load )	±10% (20%~100% Load)
Short Circuit Protection	<b>YES</b>	NO	YES
Isolation Voltage	3k VDC	3k VDC	3k VDC
Operating Temperature	<b>-40~95 °C</b>	-40~90 °C	-40~85 °C
Insulation	Functional	Functional	Functional
Product Status	New Product, Activity	Activity	NRND -> EOL
Price	Medium	Low	High

## NL2 HIGHLIGHT COMPARED WITH THE EXISTING PRODUCT.



	MOTIEN NL2	MOTIEN VE
Package & Dimensions	SIP4 0.46"x 0.29"x 0.4"	SIP4 0.46"x 0.29"x 0.4"
Pinout Compatibility	Compatible	Compatible
Output	Unregulated Single Output	Unregulated Single Output
Load Regulation	<b>±10% ~ ±20% by model (10%~100% Load )</b>	±10% ~ ±20% by model (20%~100% Load )
Short Circuit Protection	<b>YES</b>	NO
Isolation Voltage	<b>3k VDC</b>	1k ~ 3k VDC
Operating Temperature	-40~90 °C	-40~90 °C
Insulation	Functional	Functional
Product Status	New Product, Activity	Activity
Price	Is similar to VE	

# NP1 HIGHLIGHT COMPARED WITH THE EXISTING PRODUCTS.



	MOTIEN NP1	MOTIEN V1	MOTIEN V1P-H	MOTIEN M1-1W
Package & Dimensions	SIP7 0.76"x 0.24"x 0.39"	SIP7 0.76"x 0.24"x 0.39"	SIP7 0.76"x 0.24"x 0.39"	SIP7 0.76"x 0.24"x 0.39"
Pinout Compatibility	Compatible	Compatible	Compatible	Compatible
Output	Unregulated Single / Dual Output	Unregulated Single / Dual Output	Unregulated Single / Dual Output	Unregulated Single / Dual Output
Load Regulation	<b>±10% ~ ±15% by model (10%~100% Load )</b>	±10% ~ ±20% by model (20%~100% Load )	±10% (20%~100% Load)	±2.5% ~ ±6% by model (10%~100% Load )
Short Circuit Protection	<b>YES</b>	NO	YES	NO
Isolation Voltage	<b>3k ~ 6k VDC</b>	1k ~ 6k VDC	3k ~ 6k VDC	1k ~ 3k VDC
Operating Temp.	<b>-40~95 °C</b>	-40~85 °C	-40~85 °C	-40~95 °C
Insulation	Functional	Functional	Functional	Functional
Product Status	New Product, Activity	Activity	NRND -> EOL	Activity
Price	Medium	Low	High	Medium

# NP2 HIGHLIGHT COMPARED WITH THE EXISTING PRODUCTS.



	MOTIEN NP2	MOTIEN V3	MOTIEN M1-2W
Package & Dimensions	SIP7 0.76"x 0.24"x 0.39"	SIP7 0.76"x 0.24" or 0.28"x 0.39"	SIP7 0.76"x 0.24"x 0.39"
Pinout Compatibility	Compatible	Compatible	Compatible
Output	Unregulated Single / Dual Output	Unregulated Single / Dual Output	Unregulated Single / Dual Output
Load Regulation	<b>±10% ~ ±20% by model (10%~100% Load )</b>	±10% ~ ±20% by model (20%~100% Load )	±1.9% ~ ±6% by model (10%~100% Load )
Short Circuit Protection	<b>YES</b>	NO	NO
Isolation Voltage	<b>3k ~ 6k VDC</b>	1k ~ 6k VDC	1k ~ 3k VDC
Operating Temp.	-40~90 °C	-40~85 °C	-40~89 °C
Insulation	Functional	Functional	Functional
Product Status	New Product, Activity	Activity	Activity
Price	Is similar to V3		Is similar to V3

# NQ1H HIGHLIGHT COMPARED WITH THE EXISTING PRODUCT.



	MOTIEN NQ1H	MOTIEN VL
Package & Dimensions	SIP7 0.77" x 0.39" x 0.49"	SIP7 0.77" x 0.39" x 0.49"
Pinout Compatibility	Compatible	Compatible
Output	Unregulated Single / Dual / (+15/-9) Asymmetric Output	Unregulated Single / Dual / (+15/-9) Asymmetric Output
Load Regulation	±10% (10%~100% Load )	±10% (10%~100% Load )
Short Circuit Protection	YES	YES
Isolation Voltage	<b>5k VAC</b>	6k VDC
CMTI	<b>65 kV/μs</b>	-
Operating Temperature	<b>-40~95 °C</b>	-40~90 °C
Safety	<b>Reinforced with UL 62368-1 approval 300Vrms working voltage</b>	Functional
Leakage Current	2μA, typ.	2μA, typ.
Over Voltage Category	<b>OVC II</b>	-
Clearance / Creepage	6mm, min. / 9mm, min. for X Type	-
Product Status	New Product, Activity	Activity
Price	High	Low

# NQ2H HIGHLIGHT COMPARED WITH THE EXISTING PRODUCT.



	MOTIEN NQ2H	MOTIEN VL2
Package & Dimensions	SIP7 0.77" x 0.39" x 0.49"	SIP7 0.77" x 0.28" x 0.39"
Pinout Compatibility	Compatible	Compatible
Output	Unregulated Single / Dual / (+15/-9) Asymmetric Output	Unregulated Single / Dual / (+15/-9) Asymmetric Output
Load Regulation	<b>±10% ~ ±15% by model (10%~100% Load )</b>	±10% ~ ±12% by model (20%~100% Load )
Short Circuit Protection	YES	YES
Isolation Voltage	<b>5k VAC</b>	6k VDC
CMTI	<b>65 kV/μs</b>	-
Operating Temperature	<b>-40~95 °C</b>	-40~80 °C
Safety	<b>Reinforced with UL 62368-1 approval 300Vrms working voltage</b>	Functional
Leakage Current	2μA, typ.	2μA, typ.
Over Voltage Category	<b>OVC II</b>	-
Clearance / Creepage	6mm, min. / 9mm, min. for X Type	-
Product Status	New Product, Activity	Activity
Price	High	Low

# NB3R5HW COMPARED WITH TIM3.5 (BRAND T)



	MOTIEN NB3R5HW	T TIM-3.5
Package & Dimensions	DIP16 0.96" x 0.58" x 0.43"	DIP16 0.96" x 0.57" x 0.40"
Pinout Compatibility	Compatible	Compatible
Input Voltage Range	<b>4 : 1 Vin</b> 4.5 ~ 18, 9 ~ 36, 18 ~ 75 (Vdc)	2 : 1 Vin 4.5 ~ 12, 9 ~ 18, 18 ~ 36, 36 ~ 75 (Vdc)
Output	Regulated Single / Dual Output	Regulated Single / Dual Output
Ripple & Noise	50 ~ 75 mVpk-pk, typ.	50 ~ 75 mVpk-pk, typ.
Protection	UVP, OVP, SCP	UVP, OVP, SCP
Isolation Voltage	5k VAC	5k VAC
Safety	Reinforced with UL 62368-1 approval 250Vrms working voltage	Reinforced / 2MOPP with UL approval 250Vrms working voltage
Leakage Current	2μA, typ.	2μA, typ.
Over Voltage Category	OVC II	OVC II
Clearance / Creepage	8mm, min.	8mm, min.
Radiated Emission	<b>EN 55032 class B without external filter</b>	EN 55032 class B with external filter
Conducted Emission	EN 55032 class B with external filter	EN 55032 class B with external filter



## NC10HW COMPARED WITH THM10WI (BRAND T)



	MOTIEN NC10HW	T THM 10WI
Package & Dimensions	DIP24 1.25" x 0.80" x 0.41"	DIP24 1.25" x 0.80" x 0.40"
Pinout Compatibility	Compatible	Compatible
Input Voltage Range	<b>4 : 1 Vin</b> 4.5 ~ 18, 9 ~ 36, 18 ~ 75 (Vdc)	2 : 1 Vin / 4 : 1Vin 4.5 ~ 9, 18 ~ 36, 18 ~ 75 (Vdc)
Output	Regulated Single / Dual Output	Regulated Single / Dual Output
Ripple & Noise	30 ~ 40 mVpk-pk, typ.	30 ~ 40 mVpk-pk, typ.
Protection	UVP, OVP, OCP, SCP	UVP, OVP, OCP, SCP
Isolation Voltage	5k VAC	5k VAC
Safety	Reinforced with UL 62368-1 approval 250Vrms working voltage	Reinforced / 2MOPP with UL approval 250Vrms working voltage
Leakage Current	2 $\mu$ A, typ.	2 $\mu$ A, typ.
Over Voltage Category	OVC II	OVC II
Clearance / Creepage	8mm, min.	8mm, min.
Radiated Emission	EN 55032 class A without external filter	EN 55032 class A without external filter
Conducted Emission	EN 55032 class A without external filter	EN 55032 class A without external filter

## ND20HW COMPARED WITH THM20WI (BRAND T)



	MOTIEN ND20HW	T THM 20WI
Package & Dimensions	1.6" x 1"	1.6" x 1"
Pinout Compatibility	Compatible	Compatible
Input Voltage Range	4 : 1 Vin 9 ~ 36, 18 ~ 75 (Vdc)	4 : 1 Vin 9 ~ 36, 18 ~ 75 (Vdc)
Output	Regulated Single / Dual Output	Regulated Single / Dual Output
Ripple & Noise	50 ~ 75 mVpk-pk, typ.	50 ~ 75 mVpk-pk, typ.
Protection	UVP, OVP, OCP, OTP, SCP	UVP, OVP, OCP, OTP, SCP
Isolation Voltage	5k VAC	5k VAC
Safety	Reinforced with UL 62368-1 approval 250Vrms working voltage	Reinforced / 2MOPP with UL approval 250Vrms working voltage
Leakage Current	2 $\mu$ A, typ.	2 $\mu$ A, typ.
Over Voltage Category	OVC II	OVC II
Clearance / Creepage	8mm, min.	8mm, min.
Radiated Emission	EN 55032 class A without external filter	EN 55032 class A without external filter
Conducted Emission	EN 55032 class A without external filter	EN 55032 class A without external filter

## NJ30HW COMPARED WITH THM30WI (BRAND T)



	MOTIEN NJ30HW	T THM 30WI
Package & Dimensions	2" x 1"	2" x 1"
Pinout Compatibility	Compatible	Compatible
Input Voltage Range	4 : 1 Vin 9 ~ 36, 18 ~ 75 (Vdc)	4 : 1 Vin 9 ~ 36, 18 ~ 75 (Vdc)
Output	Regulated Single / Dual Output	Regulated Single / Dual Output
Ripple & Noise	50 ~ 75 mVpk-pk, typ.	50 ~ 75 mVpk-pk, typ.
Protection	UVP, OVP, OCP, OTP, SCP	UVP, OVP, OCP, OTP, SCP
Isolation Voltage	5k VAC	5k VAC
Safety	Reinforced with UL 62368-1 approval 250Vrms working voltage	Reinforced / 2MOPP with UL approval 250Vrms working voltage
Leakage Current	2 $\mu$ A, typ.	2 $\mu$ A, typ.
Over Voltage Category	OVC II	OVC II
Clearance / Creepage	8mm, min.	8mm, min.
Radiated Emission	EN 55032 class A without external filter	EN 55032 class A without external filter
Conducted Emission	EN 55032 class A without external filter	EN 55032 class A without external filter

# APPLICATION REQUIREMENT FOR DC-DC CONVERTER



## Measurement

- Low Ripple and Noise
- Low Radiated Emission
- Small Size
- Functional or Basic isolation
- SELV (Safety Extra Low Voltage) output



## Industry

- High Efficiency
- -40~85°C Operation Temp.
- Wide Input Voltage range
- Anti-Poor operating environment
- Circuit Protections
- Over 10-year supply



## Telecom

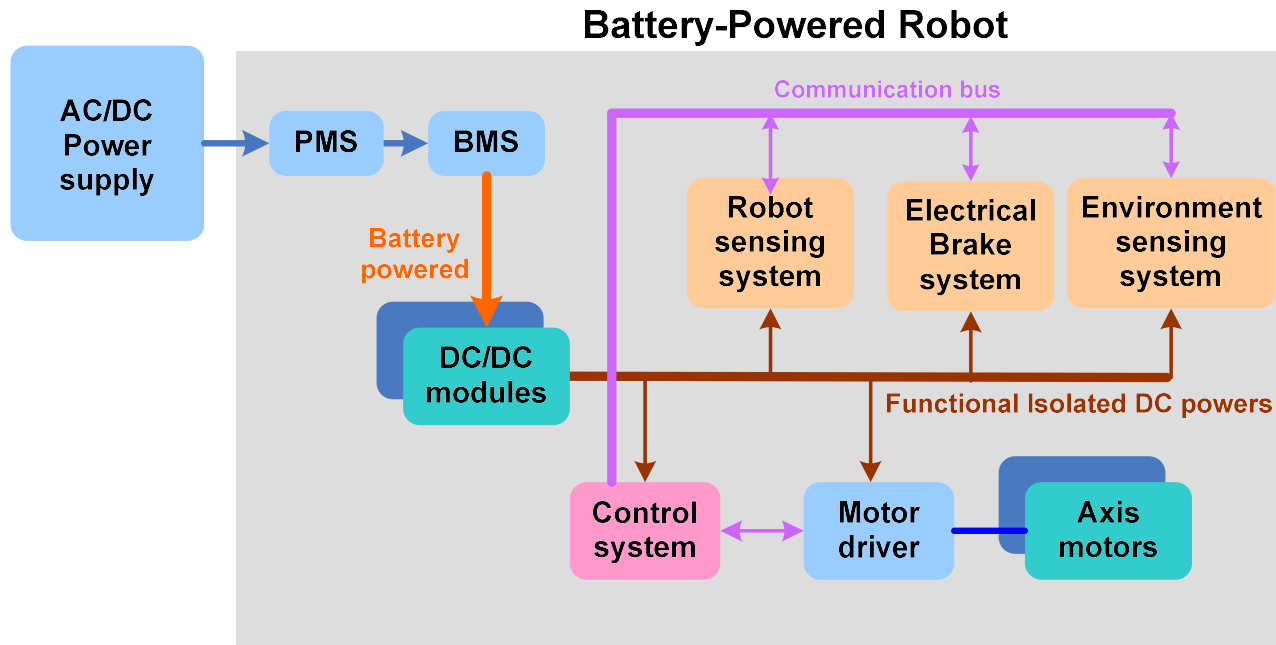
- High Efficiency
- High Reliability
- High Power Density
- High Operation Temp.
- Highest EMC ability for 5G cellular wireless networks applications.
- Wide Input Voltage range
- Circuit Protections
  
- Trend for Complex Design
- Basic or Higher isolation
- High CMTI ability
- Short-term Peak Power



## Automation

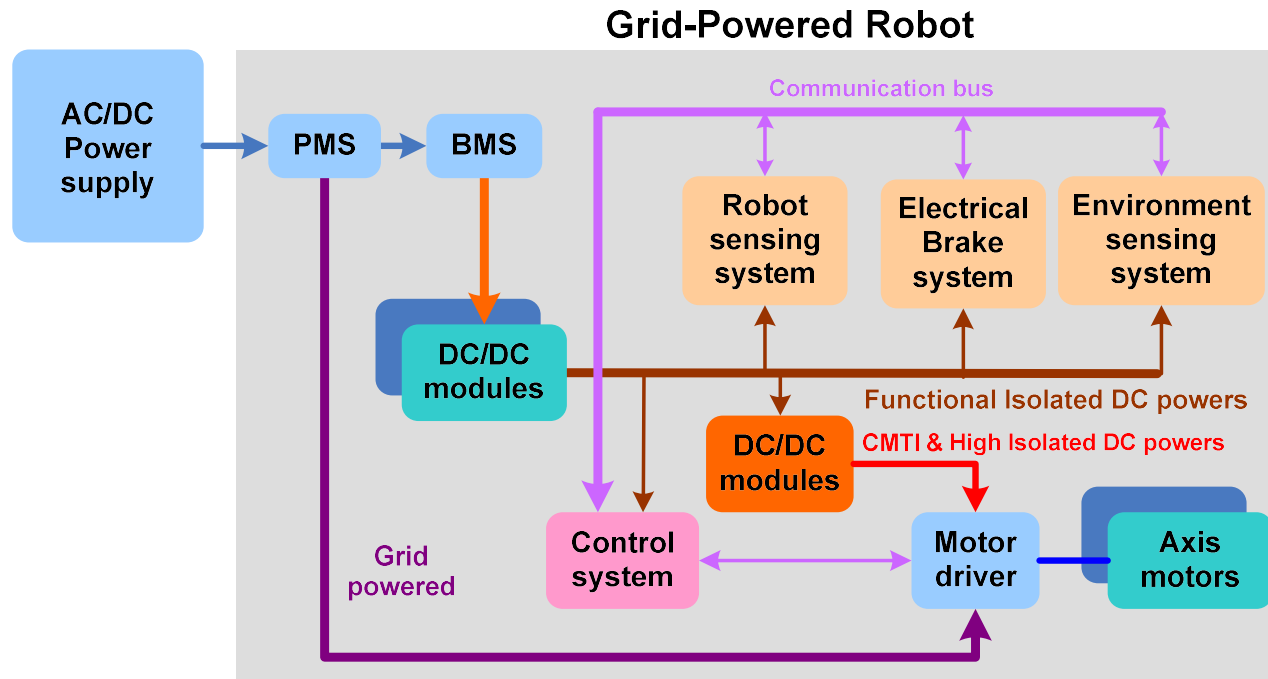
- High Efficiency
- High Reliability
- High Power Density
- High Operation Temp.
- High EMC
- Ultra Wide Input range
- Circuit Protections
- Safety approval
  
- Trend for Complex Design
- Reinforced isolation
- High CMTI ability
- Short-term Peak Power
- OVC III for Non-isolated AC/DC primary side design

# APPLICATION OF BATTERY-POWERED ROBOT



- The block diagram is an example of Battery-powered robot systems.
- For SELV of BMS output, using isolated modules to reduce the common mode noise between the systems ground loop, typically functional or basic isolation is sufficient.
- Consideration of using regulated output, wide input range, operating temperature, etc. which depend on each system requirement.

# APPLICATION OF GRID-POWERED ROBOT



- The block diagram is an example of Grid-powered robot systems.
- The safety barrier is significant that designers need to consider the high voltage between functional isolated systems and the grid-power ground.
- What additional protections need to be included with dc/dc modules in case some specified fault condition?
- In addition, many systems have potential CMTI problems dealing with analog and digital transmission signals.

# CONSIDERATION AND SELECTION FOR FIXED-INPUT PRODUCTS

## VA, V1, VL

- Fixed and stabilized input system
- Fixed load system
- No short fault condition protection requirement
- Applied to functional insulated system
- Low cost consideration



Measurement



Industry

## NL1, NL2, NP1, NP2

- Slight load variation condition
- Short fault condition protection requirement
- Apply to high operation temperature system
- High I/O functional insulation requirement
- High reliability requirement



Automation



Telecom



## NB3R5HW, NC10HW, ND20HW, NJ30HW

- Wide input variation range
- Stable output voltage requirement
- High power supply requirement
- Multiple fault condition protection
- I/O reinforced and UL 62368-1 requirement
- Built-in EN 55032 class A filter for saving space



## NQ1, NQ2

- I/O reinforced insulation requirement
- UL approval of 300Vrms working voltage up to 5000m application
- CMTI 65 kV/μs requirement for high frequency I/O transient application
- +15/-9V output for IGBT application



# CONSIDERATION AND SELECTION FOR WIDE-INPUT PRODUCTS

VD-3~6W, VK, MD, MK, M4, V6, VB-1~2W

- Wide input variation range
- Slight transient load condition
- Short fault condition protection requirement
- Applied to functional insulated system
- Low cost consideration



V7, V8, V9, M40A, M60, NA3W, MBW, VT(W)-30~50, VB-3~9

- High power density
- High transient load condition
- Multiple fault condition protection
- Apply to high operation temperature system
- High reliability requirement



Measurement



Telecom



Industry



Automation



NB3R5HW, NC10HW, ND20HW, NJ30HW

- I/O reinforced and UL 62368-1 requirement
- Low leakage current requirement
- Built-in EN 55032 class A filter for saving space



M10A, VU, VV, VTW-60, VBW-3~9, VD-8~10, VN(W)-15&30

- Low No-load power consumption
- High power density
- High transient load condition
- Multiple fault condition protection
- Apply to high operation temperature system
- High reliability requirement



