

# USB Smart Charge Modules



Molex USB smart-charge modules lead the market by combining automotive-grade durability and off-the-shelf availability through distribution

## Features and Advantages

### Modern Features

Easy to read lettering and display.  
Blue LED backlighting.  
Panel Thickness:  
3.40 to 3.80mm

### Charging Profiles Supported:

USB battery charging specification  
BC1.2 compliant.  
YD/T 1591-2009 (China Telecom  
Specification).  
Apple MFI compliant.  
1.2V Mode



## Single-Port Charger

### Electric Performance

1.0A output current.  
Battery operating voltage: 9 to 16V  
Operating temperature: -40 to +85°C

### Quality Connector Styles

Automotive-grade USB Type A  
on the front. 10K cycle life.  
MicroFit on the rear.



### Easy to Design-In

Plastic housing  
designed to fit existing  
rocker panel switch  
cut out.

## Single-Port USB Smart Charger

### Modern Features

Easy-to-read lettering and display.  
LED backlight.  
Painted and laser-etched housing.  
Panel Thickness: 2.25 to 2.65mm

### Safety Protection Features

Over-voltage, reverse-battery and  
over-current protection.  
ESD and short-circuit protection.  
Optional tethered dust caps

### Modern Features

Easy to read lettering and display.  
Halo lighting (light pipe).  
Cosmetic Molding and Pad Printed Icon.  
Panel Thickness: 2.50 to 3.50mm



### Quality Connector Styles

Automotive-grade USB Type A  
on the front. 10K cycle life.  
Molex Mini50 on the rear



### Safety Protection Features

Over-voltage,  
reverse-battery  
and over-current  
protection.  
ESD and short-  
circuit protection

### Charging Profiles Supported:

USB battery charging specification  
BC1.2 compliant.  
YD/T 1591-2009  
(China Telecom Specification).  
Apple MFI compliant.  
1.2V Mode

## Dual-Port USB-A Smart Charger

### Electric Performance

2.4A output current.  
Battery Operating Voltage: 9 to 16V.  
Operating temperature: -40 to +85°C

### Quality Connector Styles

Automotive-grade USB  
Type A on the front.  
10K cycle life.  
Molex Mini50 Connector  
on the rear



### Charging Profiles Supported

USB battery charging specification  
BC1.2 compliant. YD/T 1591-2009  
(China Telecom Specification)  
Apple MFI compliant. 1.2V mode

## Dual-Port USB-A and USB-C Smart Charger

### Safety Protection Features

Over-voltage, reverse-battery  
and over-current protection.  
ESD and short circuit protection.

### Modern Features

Easy-to-read lettering and display. Halo lighting  
(light-pipe). Cosmetic molding and pad printed  
icon. Panel thickness: 2.50 to 3.50mm

### Electric Performance

USB-C output current: 3.0A  
USB-A output current: 2.4A  
Battery operating voltage: 9 to 16V  
Operating temperature: -40 to +85°C

### Quality Connector Styles

Automotive-grade USB-A and USB-C ports on the front.  
10K cycle life. Molex Mini50 Connector on the rear



# USB Smart Charge Modules

**molex**

## Applications

### Commercial Vehicle

Construction equipment  
Farm equipment  
Trains  
Airplanes

### Automotive

Cars  
Pickup trucks  
SUVs



Automotive



Airplanes

## Specifications

### Single-Port USB Charger Module

#### REFERENCE INFORMATION

Mates With: Micro-Fit 3.0 Receptacle (Series No. 43645) and Micro-Fit 3.0 Female Crimp (Series 43030, 45773)  
Use With:  
USB A Type Connector  
Designed In: Millimeters  
RoHS: Yes (with exemption)  
Halogen Free: No  
Glow Wire Compliant: No

### Single-Port USB Charger Module

#### REFERENCE INFORMATION

Packaging: Per PK-68532-4510  
Mates With: Mini50  
Use With: Mini50  
Designed In: Millimeters  
RoHS: Yes (with exemption)  
Halogen Free: No  
Glow Wire Compliant: No  
Supported charging schemes:  
D+ and D- Divider Mode 2.7V and 2.7V  
D+ and D- 1.2V Mode  
D+ and D- Shorted Mode per USB Battery Charging Specification 1.2 (BC1.2).  
PV Test Report: Test Data Restricted  
Molex PPAP: In-Process

#### ELECTRICAL

Voltage (max.): 16V DC  
Input: 9 to 16V DC  
Output (max.): 5V DC +/-5% 1.0A  
Backlight: Blue LED, 12V DC

#### MATERIALS

Housing: Polycarbonate/Acrylonitrile Butadiene Styrene (PC+ABS), Black

#### PHYSICAL

Operating Temperature:  
-40 to +85°C (automotive grade)  
Dimensions (mm): 48.00 by 26.00 by 37.05mm  
Mating cycles: 5,000

#### ELECTRICAL

Input voltage range: 9 to 16V DC  
Output voltage range: 5V DC +/- 10% USB output  
Maximum output charging current: 2.4A DC, limited to 2.9A  
Maximum input current at maximum load: 1.5A DC  
Maximum input current for illumination line: 12mA DC  
Component BOM: AEC-Qualified

#### MATERIALS

PCB: FR4, UL 94V-0  
Plastic Housings: PC,  
Color: black for rear housing  
white for front housing  
Color finish: black over white material (on front housing)  
USB Type A:  
Housing material: high temp thermoplastic, UL-94v-0, color: black.  
Terminal: phosphor bronze, plating: gold 0.75µm  
Shield: stainless steel Ni 0.75µm min.  
Mini50 connector:  
Housing material: polyester alloy, color: black  
Terminal: brass, plating: tin

#### PHYSICAL

Industrial Operating Range: -40° to +85°C  
Non-operating: -55° to +85°C USB Module  
Envelope Dimensions:  
49.00 by 22.80 by 40.58mm  
Insertion: 35N max  
Extraction: 10N min  
Durability: 10,000 cycles  
Pull out force for docking module measured on metal plate cut out/fixture (with recommended opening): 100N min.  
Module weight: 0.028 kg

## Specifications

### Dual-Port USB-A Smart Charger

#### REFERENCE INFORMATION

Packaging: Per PK-68532-4460  
 Mates With: Mini50  
 Use With: Mini50  
 Designed In: Millimeters  
 RoHS: Yes (with exemption)  
 Halogen Free: No  
 Glow Wire Compliant: No  
 Supported charging schemes:  
 D+ and D- Divider Mode 2.7V and 2.7V  
 D+ and D- 1.2V Mode  
 D+ and D- Shorted Mode per USB Battery Charging Specification 1.2 (BC1.2).  
 PV Test Report: Test Data Restricted  
 Molex PPAP: In-Process

#### ELECTRICAL

Input voltage range: 9 to 16V DC  
 Output voltage range: 5V DC +/- 0.25V @ 2.4A  
 Maximum output charging current: 2.4A DC, limited to 2.9A  
 Maximum input current at no load: 26mA  
 Component BOM: AEC-Qualified

#### MATERIALS

Front housing: pc+abs, pg05 black  
 Surface finish (faceplate): Light Texture  
 Light pipes: PC  
 Rear housing: pc+abs, pg05 black  
 Rubber cover: TPE  
 Printed circuit board: fr4

Input power conn.: 2 USB-A ports  
 Terminal: phosphor bronze, plating: gold 0.75µm  
 Shield: stainless steel, Ni 0.75µm min.  
 Mini50 connector:  
 Housing material: polyester alloy, color: black  
 Terminal: brass, plating: tin

#### PHYSICAL

Industrial Operating Range: -40 to +85°C  
 Non-operating: -55 to +85°C USB Module  
 Color for illuminated USB halo is white.  
 Insertion: 49N max  
 Extraction: 68.8N min  
 Durability: 10,000 cycles

### Dual-Port USB-A and USB-C Smart Charger

#### REFERENCE INFORMATION

Packaging: Per PK-68532-4460  
 Mates With: Mini50  
 Use With: Mini50  
 Designed In: Millimeters  
 RoHS: Yes (with exemption)  
 Halogen Free: No  
 Glow Wire Compliant: No  
 Supported charging schemes:  
 D+ and D- Divider Mode 2.7V and 2.7V  
 D+ and D- 1.2V Mode  
 D+ and D- Shorted Mode per USB Battery Charging Specification 1.2 (BC1.2)  
 PV Test Report: Test Data Restricted  
 Molex PPAP: In-Process

#### ELECTRICAL

Input voltage range: 9 to 16V DC  
 Output voltage range: 5V DC +/- 2.5V @ 2.4A/3.0A  
 Maximum output charging current:  
 USB-A: 3.0A DC, limited to 3.6A  
 USB-C: 2.4A DC, limited to 2.9A  
 Maximum input current at no load: 26mA

#### MATERIALS

Front housing: pc+abs, cycloloy lg9000, pg05 black  
 Surface finish (faceplate): nissan#424  
 Light pipes: sc-28876 rtp 0300 2405 lt diff.  
 Rear housing: pc+abs, cycloloy lg9000, pg05 black  
 Rubber cover: empilon ha65s4  
 Printed circuit board: fr4, thickness 1.6 mm  
 Input power conn.: 1 USB-A port, 1 USB-C port

Terminal: phosphor bronze, plating: gold 0.75µm  
 Shield: stainless steel, Ni 0.75µm min.  
 Mini50 connector:  
 Housing material: polyester alloy, color: black  
 Terminal: brass, plating: tin

#### PHYSICAL

Industrial Operating Range: -40 to +85°C  
 Non-operating: -55 to +85°C USB Module  
 Color for illuminated USB halo is white  
 candles per illuminated USB halo: ordinary switch  
 2cd/m2  
 Insertion (max.): 49N  
 Extraction (min.): 68.8N  
 Durability: 10,000 cycles

## Ordering Information:

Series No.	Ports	Output Current	Charging Profiles Supported
68532-4461	Dual	2.4A	USB Battery Charging Specification BC1.2 compliant. YD/T 1591-2009 (China Telecom Specification) Apple MFI Compatible.
68532-4462			USB Battery Charging Specification BC1.2 compliant. YD/T 1591-2009 (China Telecom Specification) Apple MFI compliant. 1.2 V Mode
68532-4510	Single	1.0A	----
79540-5015	Dual	USB-A: 2.4A USB-C: 3.0A	USB Battery Charging Specification BC1.2 compliant. YD/T 1591-2009 (China Telecom Specification)
79540-5067			USB Battery Charging Specification BC1.2 compliant. YD/T 1591-2009 (China Telecom Specification)

[www.molex.com/link/invehiclesmartcharging.html](http://www.molex.com/link/invehiclesmartcharging.html)