

# HVAC Climate Control

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# HVAC Climate Control

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## VISHAY Components used for HVAC include:

- Power MOSFETS
- Diodes and Rectifiers
- Capacitors
- Resistors
- Visible LED'S
- Optical Encoders
- Customized Comfort Sensors
- Inductors/EMI Filters
- Transient/Overvoltage Protection Devices
- ESD Protection Devices
- Reverse Polarity Protection Devices
- LDOs

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## Application Overview

Automobile manufacturers have offered air conditioning in luxury cars for over 40 years. Today, virtually all cars are available with air conditioning. Basic air conditioning has evolved over the years into a complex climate control system with many advanced features such as multi-zone air distribution and sensing, and intelligent interior sunlight sensing to optimize interior air temperature. Vishay components for climate control cover a broad range of functions, including power supply (linear regulation, SMPS), backlighting, switching, optical sensing, and user interface.

# HVAC Climate Control : AIR FLOW CONTROL, Blower Control

## Alu Elcaps

Product Name	Status	Description	Features	Package	Q-Level
140CLH		Aluminum capacitors, SMD (chip); high temperature;	10 $\mu$ F - 680 $\mu$ F; life at 125 °C = 2000 h;	SMD max. 10x10x14mm	
140RTM		Aluminum capacitors, radial; high temperature, miniature;	22 $\mu$ F - 4700 $\mu$ F; life at 125 °C = 2000 h;	TH / Radial max.18x31mm	
150CLZ		Aluminum capacitors, SMD (chip); very low Z;	33 $\mu$ F - 1000 $\mu$ F; life at 105°C = 2000 h;	SMD max.10x10x14mm	
150RMI		Aluminum capacitors, radial miniature; low impedance;	100 $\mu$ F - 6800 $\mu$ F; life at 105°C = 10000 h;	TH / Radial max.18mm x 31mm	
153CRV		Aluminum capacitors, SMD (chip); long life, vertical, Pb-free;	22 $\mu$ F - 4700 $\mu$ F; life at 125°C = 4000h	SMD max.18x31mm	

## Inductors

Product Name	Status	Description	Features	Package	Q-Level
IHLP5050FD-01		Low profile, high current, shielded; low DCR, high saturation;	0.1 $\mu$ H - 10 $\mu$ H; IDC = 120A - 15.5A	SMD 5050	
IHTH0750JZ-40	NEW	Very high current, ultra-low DCR; fully shielded inductor;	0.47 $\mu$ H - 10 $\mu$ H; IDC = 80A - 20A	TH / Radial 0750	

## MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SUM110N05-06L		N-Channel, low gate charge; low thermal resistance;	N-Channel; 55V; rDS(on) = 0.060Ohms;	SMD TO-252	
SUV90N06-05		N-Channel, low gate charge; low thermal resistance;	N-Channel; 60V; rDS(on) = 0.0052Ohms;	TH / Radial TO-262	

## Schottky Rectifier

Product Name	Status	Description	Features	Package	Q-Level
MBR(F)2545CT		very high forward surge current;	VRRM = 35V - 60V; IF=15A/per Diode; IFSM = 150A	TH / Radial TO-220AB; ITO-220AB	
MBR(F)2550CT		Very low VF, dual, AEC Q-101 qualified; very high forward surge current;	VRRM = 35V - 60V; IF=15A/per Diode; IFSM = 150A	TH / Radial TO-220AB; ITO-220AB	
MBRB2545CT		Very low VF, dual, AEC Q-101 qualified; very high forward surge current;	VRRM = 35V - 60V; IF=15A/per Diode; IFSM = 150A	SMD TO-263	
MBRB2550CT		Very low VF, dual, AEC Q-101 qualified; very high forward surge current;	VRRM = 35V - 60V; IF=15A/per Diode; IFSM = 150A	SMD TO-263	

## Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
WSH2818		High power, molded construction; current sense Power Metal Strip;	5W; R001 - R1; 1%; TCR <= 75ppm;	SMD 2818	AEC Q200
WSL2726	NEW	Power Metal Strip shunts, low R-value; very low TCR, low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 2726	AEC Q200
WSL2816		Power Metal Strip shunts, low R-value; very low TCR, low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 2816	AEC Q200
WSL3921		Power Metal Strip shunts, very low R-val very low R-value, very low TCR; low thermal EMF	R0002 - R04; 1 %; TCR <= 75ppm;	SMD 3921	AEC Q200
WSLT2512		Power Metal Strip shunt, high temperatur	R01 - R50; 1%;	SMD	AEC Q200

Product Name	Status	Description	Features	Package	Q-Level
		high temperature (275 °C), low TCR; low thermal EMF	TCR <= 75ppm;	2512	

#### Termistors

Product Name	Status	Description	Features	Package	Q-Level
NTCS0603E4		Small dimension, rugged construction; high reliability;	4K7 - 100KΩ; 1%; Beta = 2000 - 6000; 1%;	SMD 0603	

#### Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW0603		Bulk Resistors, pulse resistant; good long term stability;	1R - 10MΩ; 1%; TCR = 100	SMD 0603	
CRWC0805		Bulk Resistors, pulse resistant; good long term stability;	1R - 10MΩ; 1%; TCR = 100	SMD 0603	

## HVAC Climate Control : AIR FLOW CONTROL, Vent Control

### Alu Elcaps

Product Name	Status	Description	Features	Package	Q-Level
150CLZ		Aluminum capacitors, SMD (chip); very low Z;	33 $\mu$ F - 1000 $\mu$ F;	SMD	
153CLV		Aluminum capacitors, SMD (chip); long life; vertical;	0.47 $\mu$ F - 1000 $\mu$ F;	SMD	

### Ceramic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
VJOMD X7R		Surface-mount ceramic capacitor solution for boardflex sensitive applications;	100 pF - 1.8 $\mu$ F; 50VDC - 3000VDC;	SMD 1206 - 2225	

### MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SQ7415EN	NEW	Fully AEC Q-101 qualified; low thermal resistance, fast switching;	P-Channel; rDS(on) = 0.065Ohms;	SMD PowerPAK1212-8	AEC Q101
SQ9945AEY	NEW	Fully AEC Q-101 qualified, Tj = 175 °C; dual n-channel, 60 V; for H-bridge motor application	Dual N-Channel; 60V; rDS(on) = 0.08Ohms	SMD SO-8	AEC Q101

### Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW1210LR		Sense resistors, pulse resistant; good long term stability;	R22 - R91; 5 %; TCR = 200	SMD 1210	
WSL0603		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 0603	AEC Q200
WSL0805		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 0805	AEC Q200

## HVAC Climate Control : POWER SUPPLY, EMI Filtering

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### Inductors

Product Name	Status	Description	Features	Package	Q-Level
IHLP2525EZ-01		Low profile, high current; high transient current spike capable; shielded, Low DCR	0.56 - 10 $\mu$ H; IDC=12A-4.5A	SMD 2525	
IHLP4040DZ-01		Low profile, high current; high transient current spike capable; shielded, Low DCR	0.19 - 10 $\mu$ H; IDC=90A-12A	SMD 4040	
IHLP5050FD-01		Low profile, high current; high transient current spike capable; shielded, Low DCR	0.1 $\mu$ H - 10 $\mu$ H; IDC = 120A - 15.5A	SMD 5050	

## HVAC Climate Control : POWER SUPPLY, ESD Protection

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### Ceramic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
VJHiRelX5R		MLCCs for high reliability applications;	100 pF - 6.8 $\mu$ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	
VJHiRelX7R		MLCCs for high reliability applications;	100 pF - 6.8 $\mu$ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	

### Small-Signal Diodes

Product Name	Status	Description	Features	Package	Q-Level
GCDA15C-1		Low-capacitance; bidirectional (BiAs) ESD protection; data line protection	VESD = 30kV; I <sub>pp</sub> = 10A; P <sub>pp</sub> = 300W	SMD SOT-143	
GL05T		Low-capacitance ESD protection; data line protection;	P <sub>pk</sub> = 300W; V <sub>RRM</sub> = 70V; I <sub>ppm</sub> = 17A	SMD SOT-23	
GL24T		Low-capacitance ESD protection; data line protection;	P <sub>pk</sub> = 300W; V <sub>RRM</sub> = 70V; I <sub>ppm</sub> = 5A	SMD SOT-23	

## HVAC Climate Control : POWER SUPPLY, Linear Voltage Regulator

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### LDO

Product Name	Status	Description	Features	Package	Q-Level
Si9181		Micropower 350-mA CMOS LDO regulator; with error flag/power-on reset; Adjustable output voltage	VIN = 6.5V; IOUT = 350mA	SMD TSSOP-8	
Si91871		300-mA ultra-low-noise LDO regulator; with discharge option;	VIN = 6.5V; IOUT = 300mA	SMD MLP33-5	

## HVAC Climate Control : POWER SUPPLY, Quiescent Current Switchoff

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### MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SUD50P04-09L		P-Channel, Tj = 175 °C power MOSFET; low leakage current;	P-Channel; 40V; rDS(on) = 0.0094Ohms;	SMD TO-252	
SUD50P06-15L		P-Channel, Tj = 175 °C power MOSFET; low leakage current;	P-Channel; 60V; rDS(on) = 0.150Ohms;	SMD TO-252	
SUM110P04-05		P-Ch MOSFET, 12-V/24-V Boardnet (KL15); high-side power switch, stand-by mode;	P-Channel; 40V; rDS(on) = 0.005Ohms;	SMD TO-263	
SUM110P06-07L		P-Ch MOSFET, 12-V/24-V Boardnet (KL15); high-side power switch, stand-by mode;	P-Channel; 60V; rDS(on) = 0.0069Ohms;	SMD TO-263	

## HVAC Climate Control : POWER SUPPLY, Reverse Polarity Protection

### MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SQ2309ES	NEW	P-Channel; MOSFET for general applications; IC Protection	N-Channel; 60V; rDS(on) = 0.335Ω@-10V	SMD TO-236(SOT-23)	AEC-Q
SQ7415EN	NEW	Fully AEC Q-101 qualified; low thermal resistance, fast switching;	P-Channel; rDS(on) = 0.0650hms;	SMD PowerPAK1212-8	AEC Q101
SUD08P06-155L		P-Channel, Tj = 175 °C power MOSFET; low leakage current;	P-Channel; rDS(on) = 0.1550hms;	SMD TO-252	
SUD19P06-60L		P-Channel, Tj = 175 °C power MOSFET; low leakage current;	P-Channel; rDS(on) = 0.0600hms;	SMD TO-252	

### Schottky Diodes

Product Name	Status	Description	Features	Package	Q-Level
SS3P6L	NEW	Low profile, low VF; high current density;	VF = 0.478 V	SMD TO-277A(SMPC)	
SS5P5	NEW	Low profile, low VF; high current density;	VF = 0.560 V	SMD TO-277A(SMPC)	

### Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW0603LR		Sense resistors, pulse resistant; good long term stability;	R22 - R91; 5%; TCR = 200	SMD 0603	
CRCW1206LR		Sense resistors, pulse resistant; good long term stability;	R22 - R91; 5%; TCR = 200	SMD 0805	
CRCW1210LR		Sense resistors, pulse resistant; good long term stability;	R22 - R91; 5 %; TCR = 200	SMD 1206	

### TVS Diodes

Product Name	Status	Description	Features	Package	Q-Level
SM5 A27		High surge, low VF, low leakage; high reliability; broad range of breakdown voltages	VBR = 27V; IFSM = 500A;	SMD DO-218 AB	
SM8 A27		High surge, low VF, low leakage; high reliability; broad range of breakdown voltages	VBR = 27V; IFSM = 700A;	SMD DO-218 AB	
SM8S24 A		High surge, low VF, low leakage; high reliability; broad range of breakdown voltages	Ippm = 38.9A; IFSM = 700A	SMD DO-218 AB	

# HVAC Climate Control : POWER SUPPLY, Switch Mode Power Supply

## Alu Elcaps

Product Name	Status	Description	Features	Package	Q-Level
150CLZ		Aluminum capacitors, SMD (chip); low Z;	33 $\mu$ F - 1000 $\mu$ F	SMD	
150CRV		Aluminum capacitors, SMD (chip), Pb-free	33 $\mu$ F - 1000 $\mu$ F;	SMD	
150CRZ		Aluminum capacitors, SMD (chip); low Z, Pb-free;	33 $\mu$ F - 1000 $\mu$ F;	SMD 8x8x10mm to 10x10x14mm	
153CLV		Aluminum capacitors, SMD (chip); long life;	0.47 $\mu$ F - 1000 $\mu$ F;	SMD	
153CRV		Aluminum capacitors, SMD (chip); long life, Pb-free;	0.47 $\mu$ F - 1000 $\mu$ F;	SMD	

## Ceramic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
VJOMD X7R		Surface-mount ceramic capacitor solution for boardflex sensitive applications	100 pF - 1.8 $\mu$ F; 50VDC - 3000VDC;	SMD 1206 - 2225	
VJOMD-COG	NEW	Surface-mount ceramic capacitor solution for boardflex sensitive applications	100 pF - 47 $\mu$ F; 50VDC - 3000VDC;	SMD 1206 - 2225	

## Current Sense Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW1218LR		Sense resistors, pulse resistant; good long term stability;	R10 - R91; 5 %; TCR = 200	SMD 1218	
CRCW2010LR		Sense resistors, pulse resistant; good long term stability;	R10 - R91; 5 %; TCR = 200	SMD 2010	
CRCW2512LR		Sense resistors, pulse resistant; good long term stability;	R10 - R91, 5 %, TCR = 200	SMD 2512	
WSF2012		Power metal film, high resistance; molded construction;	5R - 10K $\Omega$ ; 1%; TCR = 100;	SMD 2012	AEC Q200
WSF2512		Power metal film, high resistance; molded construction;	5R - 10K $\Omega$ ; 1%; TCR = 100;	SMD 2512	AEC Q200
WSL0603		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 0603	AEC Q200
WSL0805		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 0805	AEC Q200
WSL1206		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 1206	AEC Q200
WSL2010		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 2010	AEC Q200
WSL2512		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 2512	AEC Q200

## Inductors

Product Name	Status	Description	Features	Package	Q-Level
IHLP1616BZ-01		Low profile, high current, shielded; low DCR, high saturation;	0.1 - 2.2 $\mu$ H; IDC=35A - 6A	SMD 1616	
IHLP2525AH-01		Low profile, high current, shielded; low DCR, high saturation;	0.1 - 4.7 $\mu$ H; IDC=40A - 8A	SMD 2525	
IHLP2525CZ-01		Low profile, high current, shielded; low DCR, high saturation;	0.1 - 10 $\mu$ H; IDC=60A - 7A	SMD 2525	

## MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
Si2308DS		N-Channel MOSFET for 12-V Boardnet SMPS; buck configuration;	N-Channel; 60V; rDS(on) = 0.16Ohms	SMD TO-236(SOT-23)	
Si2318CDS	NEW	N-Channel 40V (D-S) MOSFET	rDS(on) = 0.042Ohms ID=5.6	SMD TO-236(SOT-23)	
SQ2328ES		N-Channel MOSFET for 12-V Boardnet SMPS; buck configuration;	N-Channel; 100V; rDS(on) = 0.3Ohms	SMD TO-236(SOT-23)	

### Schottky Diodes

Product Name	Status	Description	Features	Package	Q-Level
SS3P4L	NEW	Low VF, high current density;	VF = 0.335 V	SMD TO-277A(SMPC)	
SS3P6L	NEW	Low VF, high current density;	VF = 0.478 V	SMD TO-277A(SMPC)	
VJHiRelX5R		MLCCs for high reliability applications;	100 pF - 6.8 $\mu$ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	
VJHiRelX7R		MLCCs for high reliability applications;	100 pF - 6.8 $\mu$ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	

## HVAC Climate Control : SENSORS, Compartment Temperature

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### Thermistor

Product Name	Status	Description	Features	Package	Q-Level
1T1002-1		Small dimension, conformal coated;	1K $\Omega$ - 100K $\Omega$ ; 1%; Beta = 3000 - 5000; 1%	TH / Radial	
NTCS0603E4		Small dimension, rugged construction; high reliability;	4K7 - 100K $\Omega$ ; 1%; Beta = 2000 - 6000; 1%;	SMD 0603	

# HVAC Climate Control : SENSORS, Humidity Sensor

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## Humidity Sensor

Product Name	Status	Description	Features	Package	Q-Level
2381 691 90001				SMD	

## HVAC Climate Control : SENSORS, Outside Temperature

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### Thermistor

Product Name	Status	Description	Features	Package	Q-Level
1T1002-1		Small dimension, conformal coated;	1K $\Omega$ - 100K $\Omega$ ; 1%; Beta = 3000 - 5000; 1%	TH / Radial	
NTCS0603E4		Small dimension, rugged construction; high reliability;	4K7 - 100K $\Omega$ ; 1%; Beta = 2000 - 6000; 1%;	SMD 0603	

# HVAC Climate Control : SENSORS, Solar Sensor

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Optical

Product Name	Status	Description	Features	Package	Q-Level
K853P	SOON	Sun position detection;		TH / Radial	

## HVAC Climate Control : THERMAL MANAGEMENT, Analog Filtering

### Ceramic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
VJHiRelX5R		MLCCs for high reliability applications;	100 pF - 6.8 $\mu$ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	
VJHiRelX7R		MLCCs for high reliability applications;	100 pF - 6.8 $\mu$ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	

### Foil Resistors

Product Name	Status	Description	Features	Package	Q-Level
VCS2516		High-precision foil surface-mount; current sensing chip resistors with TCR <= $\pm$ 2; Load Life <= $\pm$ 0,02%	0R01 - 0R2; TCR <= $\pm$ 2ppm; Load Life <= $\pm$ 0,02%	SMD 2516	

### Resistor Arrays

Product Name	Status	Description	Features	Package	Q-Level
ACAS0612		Thin film precision resistor array; pulse resistant, high stability;	100R - 221K $\Omega$ , 0.25%; ratio = 0.1%	SMD 1206	
CRA04S08		Thick film resistor array;	10R - 1M $\Omega$ ; 1%;	SMD 0805	
CRA06S08		Thick film resistor array;	10R - 1M $\Omega$ ; 1 %;	SMD 1206	

### Thin Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
TNPW0402		Ultra-stable thin film technology; Pulse resistant;	10R - 100K $\Omega$ ; 0.1% - 1%;	0402 0402	
TNPW0603		Ultra-stable thin film technology; Pulse resistant;	10R - 332K $\Omega$ ; 0.1% - 1%;	0603 0603	
TNPW0805		Ultra-stable thin film technology; Pulse resistant;	10R - 1M0 $\Omega$ ; 0.1% - 1%;	0805 0805	
TNPW1206		Ultra-stable thin film technology; Pulse resistant;	10R - 2M $\Omega$ ; 0.1% - 1%;	1206 1206	

## HVAC Climate Control : THERMAL MANAGEMENT, PTC Heating Control

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### MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SUM110N04-2m3L		N-Channel, 40 V, very low rDS(on); very low switching loss, logic level;	N-Channel; 40V; rDS(on) = 0.0023Ohms;	SMD TO-252	

### Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
WSH2818		High power, molded construction; current sense Power Metal Strip;	5W; R001 - R1; 1%; TCR <= 75ppm;	SMD 2818	AEC Q200
WSL3921		Power Metal Strip shunts, very low R-Val very low R-Value, very low TCR; low thermal EMF	R0002 - R04; 1 %; TCR <= 75ppm;	SMD 3921	AEC Q200
WSLT2512		Power Metal Strip Shunt; high temperature (275 °C), low TCR; low thermal EMF	R01 - R50; 1%; TCR <= 75ppm;	SMD 2512	AEC Q200

### Termistors

Product Name	Status	Description	Features	Package	Q-Level
NTCS0603E4		Small dimension, rugged construction; high reliability;	4K7 - 100KΩ; 1%; Beta = 2000 - 6000; 1%;	SMD 0603	

## HVAC Climate Control : THERMAL MANAGEMENT, Seat Heating Control

### MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SUM110N04-2m3L		N-Channel, 40 V, very low rDS(on); very low switching loss, logic level;	N-Channel; 40V; rDS(on) = 0.0023Ohms;	SMD TO-252	
SUM110N06-05L		N-Channel MOSFET low-side switch for 24-V Boardnet;	N-Channel; 60V, rDS(on) = 0.0052Ohms;	SMD TO-252	
SUM110P04-05		P-Channel MOSFET high-side power switch; low rDS(on);	P-Channel; 40V; rDS(on) = 0.005Ohms;	SMD TO-263	

### Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
WSL3921		Power Metal Strip shunts, very low TCR; low thermal EMF;	R0002 - R04; 1 %; TCR <= 75ppm;	SMD 3921	AEC Q200
WSLT2512		Power Metal Strip Shunt; high temperature (275 °C), low TCR; low thermal EMF	R01 - R50; 1%; TCR <= 75ppm;	SMD 2512	AEC Q200
WSR-3		Power Metal Strip shunts, very low TCR; low thermal EMF;	3W; R001 - R2; 1 %; TCR <= 75ppm;	SMD 4628	AEC Q200

### Termistors

Product Name	Status	Description	Features	Package	Q-Level
NTCS0603E4		Small dimension, rugged construction; high reliability;	4K7 - 100KΩ; 1%; Beta = 2000 - 6000; 1%;	SMD 0603	

## HVAC Climate Control : USER INTERFACE, Backlight Control

### ESD Diodes

Product Name	Status	Description	Features	Package	Q-Level
GCDA15C-1		Low-capacitance; bidirectional (BiAs) ESD protection; data line protection	VESD = 30kV; Ipp = 10A; Ppp = 300W	SMD SOT-143	
GL05T		Low-capacitance ESD protection; data line protection;	Ppk = 300W; VRRM = 70V; Ippm = 17A	SMD SOT-23	
GL24T		Low-capacitance ESD protection; data line protection;	Ppk = 300W; VRRM = 70V; Ippm = 5A	SMD SOT-23	

### MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SQ7415EN	NEW	Fully AEC Q-101 qualified; low thermal resistance, fast switching;	P-Channel; rDS(on) = 0.065Ohms;	SMD PowerPAK1212-8	AEC Q101
SUD50P10-43L		P-Channel, high voltage, low rDS(on); logic level, booster switch;	P-Channel; 100V; rDS(on) = 0.043Ohms;	SMD TO-252	

### Resistor Networks / Arrays

Product Name	Status	Description	Features	Package	Q-Level
ACAS0612		Thin film precision resistor array; pulse resistant, high stability;	100R - 221KΩ, 0.25%; ratio = 0.1%	SMD 1206	
CRA04S08		Thick film resistor array;	10R - 1MΩ; 1%;	SMD 0805	
CRA06E&S		Thick film resistor array;	10R - 1MΩ; 1 %;	SMD 1206	
CRA12E&S		Thick film resistor array;	10R - 1MΩ; 1%;	SMD 1206	
CSC01		Single-in-line (SIP) resistor networks; Thick-Film Technology, Coated;	10R - 2M2; 1%	TH / SIP Network	
CSC03		Single-in-line (SIP) resistor networks; Thick-Film Technology, Coated;	10R - 2M2; 1%	TH / SIP Network	
CSC05		Single-in-line (SIP) resistor networks; Thick-Film Technology, Coated;	10R - 2M2; 1%	TH / SIP Network	
PR100.135,182		High-precision resistor arrays; voltage divider amplifying;	TCR = 10 ppm; R ratio<= 0.02 %	SMD / Array	

### Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW2010LR		Sense resistors, pulse resistant; good long term stability;	R10 - R91; 5 %; TCR = 200	SMD 2010	
CRCW2512LR		Sense resistors, pulse resistant; good long term stability;	R10 - R91, 5 %, TCR = 200	SMD 2512	
SR5		Open-air sense resistor	5 W, R004 - R05; 1%;	TH / Radial	
WSR-2		High power, molded construction; current Sense Power Metal Strip;	2W; R001 - 1R; 1 %; TCR <= 75ppm;	SMD 4628	AEC Q200
WSR-3		High power, molded construction; current Sense Power Metal Strip;	3W; R001 - R2; 1 %; TCR <= 75ppm;	SMD 4628	AEC Q200
WSR-5		High power, molded construction; current Sense Power Metal Strip;	5W; R001 - R03; 1 %; TCR <= 75ppm;	SMD 4627	AEC Q200
WSZ6720	NEW	Low-cost wire-wound, cement coating;	R10 - 15KΩ; 1 %; TCR <= 50ppm;	SMD 6720	
WSZ7532	NEW	Low-cost wire-wound, cement coating;	R10 - 15KΩ; 1 %; TCR <= 50ppm;	SMD 7532	

## Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW0402		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0402	
CRCW0603		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0603	
CRCW0805		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0805	
CRCW1206		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 1206	
CRCW1210		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 1210	
CRCW2010		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 2010	
CRCW2512		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 2512	
RCA2010	NEW	Automotive grade; sulfur resistant Termination Thick-Film Technology	1R - 10M $\Omega$ ; 1 %; TCR < = 100ppm	SMD 2010	
RCA2512	NEW	Automotive grade; sulfur resistant Termination Thick-Film Technology	1R - 10M $\Omega$ ; 1 %; TCR < = 100ppm	SMD 2512	

## Zener Diodes

Product Name	Status	Description	Features	Package	Q-Level
BZG04-xx		Reference voltage or overvoltage protection; surge current specified	VF = 1V or 2V; VR = 8.2V - 220V	SMD DO-214 AC	
BZX85-Series		Reference voltage or overvoltage protection; surge current specified	Tj = 175 °C; Vz = 2.5V - 98V	TH / Axial DO41	
SMZGnnB		Power voltage-regulating diode; glass passivated chip, low impedance;	Vz = 9.1V - 68V; IR =5 $\mu$ A; PD = 1.5W	SMD DO-215AA (SMBG)	

## HVAC Climate Control : USER INTERFACE, Display Driver

### ESD Diodes

Product Name	Status	Description	Features	Package	Q-Level
GCD A15C-1		Low-capacitance; bidirectional (BiAs) ESD protection; data line protection	VESD = 30kV; I <sub>pp</sub> = 10A; P <sub>pp</sub> = 300W	SMD SOT-143	
GL05T		Low-capacitance ESD protection; data line protection;	P <sub>pk</sub> = 300W; VRRM = 70V; I <sub>ppm</sub> = 17A	SMD SOT-23	
GL24T		Low-capacitance ESD protection; data line protection;	P <sub>pk</sub> = 300W; VRRM = 70V; I <sub>ppm</sub> = 5A	SMD SOT-23	

### LDO

Product Name	Status	Description	Features	Package	Q-Level
Si9181		Micropower 350-mA CMOS LDO regulator; with error flag/power-on reset; Adjustable output voltage	V <sub>IN</sub> = 6.5V; I <sub>OUT</sub> = 350mA	SMD TSSOP-8	
Si91871		300-mA ultra-low-noise LDO regulator; with discharge option;	V <sub>IN</sub> = 6.5V; I <sub>OUT</sub> = 300mA	SMD MLP33-5	

### Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW0402		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0402	
CRCW0603		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0603	
CRCW0805		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0805	
CRCW1206		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 1206	
CRCW1210		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 1210	
CRCW2010		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 2010	
CRCW2512		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 2512	

### TVS Diodes

Product Name	Status	Description	Features	Package	Q-Level
SM5 A27		High surge, low V <sub>F</sub> , low leakage; high reliability;	V <sub>BR</sub> = 27V; IFSM = 500A;	SMD DO-218 AB	
SM8 A27		High surge, low V <sub>F</sub> , low leakage; high reliability;	V <sub>BR</sub> = 27V; IFSM = 700A;	SMD DO-218 AB	

## HVAC Climate Control : USER INTERFACE, LED Driver

### MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
Si2318CDS	NEW	N-Channel 40V (D-S) MOSFET	rDS(on) = 0.042Ohms ID=5.6A	SMD TO-236 (SOT-23)	
SQ2309ES	NEW	P-Channel; MOSFET for general applications Automotive AEC-Q101 qualified	N-Channel; 60V;Id=-1.7A rDS(on) = 0.335Ω@-10V	SMD TO-236 (SOT-23)	AEC-Q
SQ7415EN	NEW	Fully AEC Q-101 qualified; low thermal resistance; fast Switching	P-Channel; rDS(on) = 0.060Ohms;	SMD PowerPAK1212-8	AEC Q101

### Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
WSL0603		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 0603	AEC Q200
WSL0805		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 0805	AEC Q200

### Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW0402		Bulk resistors, pulse resistant; good long term stability;	1R - 10MΩ; 1%; TCR = 100	SMD 0402	
CRWC0603		Bulk resistors, pulse resistant; good long term stability;	1R - 10MΩ; 1%; TCR = 100	SMD 0603	
CRWC0805		Bulk resistors, pulse resistant; good long term stability;	1R - 10MΩ; 1%; TCR = 100	SMD 0603	

### Zener Diodes

Product Name	Status	Description	Features	Package	Q-Level
BZG04-xx		Reference voltage or overvoltage protection; surge current specified	VF = 1V or 2V; VR = 8.2V - 220V	SMD DO-214 AC	
BZX85-Series		Reference voltage or overvoltage protection; surge current specified	Tj = 175 °C; Vz = 2.5V - 98V	TH / Axial DO41	
SMZGnnB		Power voltage-regulating diode; glass passivated chip, low impedance;	Vz = 9.1V - 68V; IR =5μA; PD = 1.5W	SMD DO-215AA (SMBG)	

## HVAC Climate Control : USER INTERFACE, LEDs

### LEDs

Product Name	Status	Description	Features	Package	Q-Level
VLME2300 -GS08		AllnGaP on GaAs; luminous intensity categorized; yellow, 60°	56 mcd - 112 mcd; (typical 10 mA), 590 nm;	SMD MiniLED 2.3x1.3x1.4mm	
VLME310x -GS08		AllnGaP on GaAs; luminous intensity categorized; yellow , 60°	28 mcd - 140 mcd; (typical 10mA); 581 nm - 594 nm	SMD PLCC-2	
VLMF2300 -GS08		AllnGaP on GaAs; luminous intensity categorized; orange, 60°	56 mcd - 112 mcd; (typical 10mA); 610 nm;	SMD MiniLED 2.3x1.3x1.4mm	
VLMF310x -GS08		AllnGaP on GaAs; luminous intensity categorized; soft orange, 60°	28 mcd - 112 mcd; (typical 10mA); 598 nm - 611 nm	SMD PLCC-2	
VLMK2300 -GS08		AllnGaP on GaAs; luminous intensity categorized; red , 60°	35.5 mcd - 90 mcd; (typical 10mA); 643 nm;	SMD MiniLED 2.3x1.3x1.4mm	
VLMK310x -GS08		AllnGaP on GaAs; luminous intensity categorized; red , 60°	11.2 mcd - 90 mcd; (typical 10mA); 543 nm - 630 nm	SMD PLCC-2	
VLMO31xx-GS08		GaAsP on GaP; luminous intensity categorized; soft orange, 60°	4.5 mcd - 18 mcd; (typical 10mA); 598 nm - 611 nm	SMD PLCC-2	

## HVAC Climate Control : USER INTERFACE, Rotary Encoder

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### Reflective Sensors

Product Name	Status	Description	Features	Package	Q-Level
TCND5000		Reflective sensor for touchless switch;	Peak operating range = 2 - 25mm; I <sub>ra</sub> > 0.11μA; Daylight blocking filter	SMD 6x4.3x3.75mm	
VCNL4000	NEW	Fully Integrated Proximity and Ambient Light Sensor with IR-Emitter and I2C Interface	proximity range 20cm light sensing 0 - 13klux 16 bit resolution	SMD 3.95x3.95x.75	

### Transmissive Sensors

Product Name	Status	Description	Features	Package	Q-Level
TCUT1300X01	NEW	Subminiature, dual-channel, transmissive optical sensor w. phototransistor output RoHS compliant solder profile	V <sub>R</sub> = 5 V; I <sub>F</sub> = 25mA; P <sub>v</sub> = 75mW;	SMD	

