

# 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
<a href="#">140RTM</a>		Aluminum capacitors, radial; high temperature, miniature;	22 $\mu$ F - 4700 $\mu$ F; Life@125°C = 4000h	TH / Radial max.18x31mm	AEC Q200
<a href="#">150CRZ</a>		Aluminum capacitors, SMD (chip); low Z, Pb-free;	4,7...10000 $\mu$ F, Life@105°C 10000h	SMD max 18x18x21	AEC Q200
<a href="#">150RMI</a>		Aluminum capacitors, radial miniature; low impedance;	100 $\mu$ F - 6800 $\mu$ F; Life@105°C = 10000h	TH / Radial max.18mm x 31mm	AEC Q200
<a href="#">153CRV</a>		Aluminum capacitors, SMD (chip); long life, vertical, Pb-free;	0.47 $\mu$ F - 1000 $\mu$ F; Life@105°C 3000h	SMD max.10x10x14	

## Inductors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">IHLP5050FD-A1</a>		Low profile, high current, shielded; low DCR, high saturation;	0.1 $\mu$ H - 10 $\mu$ H; IDC = 120A - 15.5A	SMD 5050	
<a href="#">IHTH0750IZ-5A</a>	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
<a href="#">SUM110N05-06L</a>		N-Channel, low gate charge; low thermal resistance;	N-Channel; 55V; rDS(on) = 0.060Ohms;	SMD TO-252	
<a href="#">SUV90N06-05</a>		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
<a href="#">MBR(F)2545CT</a>		very high forward surge current;	VRRM = 35V - 60V; IF=15A/per Diode; IFSM = 150A	TH / Radial TO-220AB; ITO-220AB	
<a href="#">MBR(F)2550CT</a>		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	
<a href="#">MBRB2545CT</a>		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	
<a href="#">MBRB2550CT</a>		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
<a href="#">WSHM2818</a>		Power Metal Strip Shunts Very High Power- Small Size Low Thermal EMF	R001...R1, 1% TCR <= 75ppm; P70 = 7W	SMD 2818	AEC Q200
<a href="#">WSL2726</a>	NEW	Power Metal Strip Shunt 4-Term- Design For Accurate Sensing Very Low R Value; Very Low TCR;	R0003...R005; 1% TCR <= 75ppm; P70 = 3W	SMD 2726	AEC Q200
<a href="#">WSL2816</a>		Power Metal Strip Shunts Very Low R-Value; Very Low TCR; Low Thermal EMF;	R01...R1, 1%, TCR <= 75ppm; P70 = 2 ... 3W	SMD 2816	AEC Q200
<a href="#">WSL3921</a>		Power Metal Strip Shunts; very low R-value, very low TCR; low thermal EMF	R0002 - R04; 1 %; TCR <= +-75ppm; P70 = 3W	SMD 3921	AEC Q200

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">WSLT2512</a>		Power Metal Strip Shunts; High Temp. (275°C); Low TCR; low thermal EMF	R01 - R50; 1%; TCR +- 75ppm; P70 = 1W	SMD 2512	AEC Q200

Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">CRCW0603</a>		Bulk Resistors, pulse resistant; good long term stability;	1R - 10MΩ; 1%; TCR = 100	SMD 0603	
<a href="#">CRWC0805</a>		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
<a href="#">146CTI</a>		Aluminum Capacitors; SMD (Chip); low impedance, high temperature	22...4700 $\mu$ F, Life@125°C = 6000h	SMD max 18x18x21	AEC Q200
<a href="#">146RTI</a>		Aluminum Capacitors; Radial; low impedance, high temperature	68...6800 $\mu$ F, Life@125°C = 6000h	TH / Radial max18x35mm	AEC Q200
<a href="#">150CRZ</a>		Aluminum capacitors, SMD (chip); low Z, Pb-free;	4,7...10000 $\mu$ F, Life@105°C 10000h	SMD max 18x18x21	AEC Q200
<a href="#">153CRV</a>		Aluminum capacitors, SMD (chip); long life, vertical, Pb-free;	0.47 $\mu$ F - 1000 $\mu$ F; Life@105°C 3000h	SMD max.10x10x14	

## Ceramic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">VJ...31/VJ...34 Automotive MLCC</a>		SMD Ceramic Capacitor Solutions High Voltage Applications Boardflex-Sensitive Applications	1.0pF...1 $\mu$ F 10Vdc ... 3000Vdc;	SMD 0402...1812	

## MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">SQ7415EN</a>	NEW	Fully AEC Q-101 qualified; low thermal resistance, fast switching;	P-Channel; rDS(on) = 0.065Ohms;	SMD PowerPAK1212-8	AEC Q101
<a href="#">SQ9945AEY</a>	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
<a href="#">WSL0603</a>		Power Metal Strip Shunts; Very Low R Value; Very Low TCR; Low Thermal EMF;	R01 - R1; 1 % TCR $\pm$ 75ppm P70 = 0.1W	SMD 0603	AEC Q200
<a href="#">WSL0805</a>		Power Metal Strip Shunts; Very Low R Value; Very Low TCR; Low Thermal EMF;	R005 - R2; 1 %; TCR $\pm$ 75ppm P70 = 0.125W	SMD 0805	AEC Q200

## HVAC Climate Control : Power Supply, EMI Filtering

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### Inductors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">IHLP2525EZ-01</a>		Low profile, high current; high transient current spike capable; shielded, Low DCR	0.56 - 10 $\mu$ H; IDC=12A-4.5A	SMD 2525	
<a href="#">IHLP4040DZ-A1</a>		Low profile, high current; high transient current spike capable; shielded, Low DCR	0.19 - 10 $\mu$ H; IDC=90A-12A	SMD 4040	
<a href="#">IHLP5050FD-A1</a>		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
<a href="#">VJ...31/VJ...34</a> <a href="#">Automotive MLCC</a>		SMD Ceramic Capacitor Solutions High Voltage Applications Boardflex-Sensitive Applications	1.0pF...1µF 10Vdc ... 3000Vdc	SMD 0402...1812	

### Small-Signal Diodes

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">GL05T</a>		Low-capacitance ESD protection; data line protection;	Ppk = 300W; VRRM = 70V; Ippm = 17A	SMD SOT-23	
<a href="#">GL24T</a>		Low-capacitance ESD protection; data line protection;	Ppk = 300W; VRRM = 70V; Ippm = 5A	SMD SOT-23	

## HVAC Climate Control : Power Supply, Quiescent Current Switchoff

### MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">SUD50P04-09L</a>		P-Channel, Tj = 175 °C power MOSFET; low leakage current;	P-Channel; 40V; rDS(on) = 0.0094Ohms;	SMD TO-252	
<a href="#">SUD50P06-15L</a>		P-Channel, Tj = 175 °C power MOSFET; low leakage current;	P-Channel; 60V; rDS(on) = 0.150Ohms;	SMD TO-252	
<a href="#">SUM110P04-05</a>		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	
<a href="#">SUM110P06-07L</a>		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
<a href="#">SQ2309ES</a>	NEW	P-Channel; MOSFET for general applications; IC Protection	N-Channel; 60V; rDS(on) = 0.335Ω@-10V	SMD TO-236(SOT-23)	AEC-Q
<a href="#">SQ7415EN</a>	NEW	Fully AEC Q-101 qualified; low thermal resistance, fast switching;	P-Channel; rDS(on) = 0.065Ohms;	SMD PowerPAK1212-8	AEC Q101
<a href="#">SUD19P06-60L</a>		P-Channel, Tj = 175 °C power MOSFET; low leakage current;	P-Channel; rDS(on) = 0.060Ohms;	SMD TO-252	

### Schottky Diodes

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

### TVS Diodes

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">SM5 A27</a>		High surge, low VF, low leakage; high reliability; broad range of breakdown voltages	VBR = 27V; IFSM = 500A;	SMD DO-218 AB	
<a href="#">SM8 A27</a>		High surge, low VF, low leakage; high reliability; broad range of breakdown voltages	VBR = 27V; IFSM = 700A;	SMD DO-218 AB	
<a href="#">SM8S24 A</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
<a href="#">146CTI</a>		Aluminum Capacitors; SMD (Chip); low impedance, high temperature	22...4700 $\mu$ F, Life@125°C = 6000h	SMD max 18x18x21	AEC Q200
<a href="#">146RTI</a>		Aluminum Capacitors; Radial; low impedance, high temperature	68...6800 $\mu$ F, Life@125°C = 6000h	TH / Radial max18x35mm	AEC Q200
<a href="#">150CRZ</a>		Aluminum capacitors, SMD (chip); low Z, Pb-free;	4,7...10000 $\mu$ F, Life@105°C 10000h	SMD max 18x18x21	AEC Q200
<a href="#">153CRV</a>		Aluminum capacitors, SMD (chip); long life, vertical, Pb-free;	0.47 $\mu$ F - 1000 $\mu$ F; Life@105°C 3000h	SMD max.10x10x14	

## Ceramic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">VJ...31/VJ...34</a> <a href="#">Automotive MLCC</a>		SMD Ceramic Capacitor Solutions High Voltage Applications Boardflex-Sensitive Applications	1.0pF...1 $\mu$ F 10Vdc ... 3000Vdc	SMD 0402...1812	

## Current Sense Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">WSF2012</a>		Power metal film, high resistance; molded construction;	5R-1.43K $\Omega$ ; 1%; TCR100	SMD 2012	
<a href="#">WSF2515</a>		Power metal film, high resistance; molded construction;	10R - 10K $\Omega$ ; 1%; TCR = 10	SMD 2515	AEC Q200
<a href="#">WSL0603</a>		Power Metal Strip Shunts; Very Low R Value; Very Low TCR; Low Thermal EMF;	R01 - R1; 1 %; TCR +- 75ppm; P70 = 0.1W	SMD 0603	AEC Q200
<a href="#">WSL0805</a>		Power Metal Strip Shunts;; Very Low R Value; Very Low TCR; Low Thermal EMF;	R005 - R2; 1 %; TCR $\pm$ 75ppm P70 = 0.125W	SMD 0805	AEC Q200
<a href="#">WSL1206</a>		Power Metal Strip Shunts; Very Low R Value; Very Low TCR; Low Thermal EMF;	R001 - R2; 1 %; TCR $\pm$ 75ppm P70 = 0.25W	SMD 1206	AEC Q200
<a href="#">WSL2010</a>		Power Metal Strip Shunts; Very Low R Value; Very Low TCR; low thermal EMF;	R001 - R5; 1 %; TCR $\pm$ 75ppm P70 = 0.5W	SMD 2010	AEC Q200
<a href="#">WSL2512</a>		Power Metal Strip Shunts; Very Low R Value; Very Low TCR; low thermal EMF;	R0005 - R5; 1 %; TCR $\pm$ 75ppm P70 = 1W	SMD 2512	AEC Q200

## Inductors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">IHLP1616BZ-A1</a>		Low profile, high current, shielded; low DCR, high saturation;	0.1 - 2.2 $\mu$ H; IDC=35A - 6A	SMD 1616	
<a href="#">IHLP2525AH-A1</a>		Low profile, high current, shielded; low DCR, high saturation;	0.1 - 4.7 $\mu$ H; IDC=40A - 8A	SMD 2525	
<a href="#">IHLP2525CZ-A1</a>		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
<a href="#">Si2308DS</a>		N-Channel MOSFET for 12-V Boardnet SMPS; buck configuration;	N-Channel; 60V; rDS(on) = 0.16Ohms	SMD TO-236(SOT-23)	
<a href="#">Si2318CDS</a>	NEW	N-Channel 40V (D-S) MOSFET	rDS(on) = 0.042Ohms	SMD	

Product Name	Status	Description	Features	Package	Q-Level
			ID=5.6	TO-236(SOT-23)	
<a href="#">SQ2328ES</a>		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
<a href="#">SS3P4L</a>	NEW	Low VF, high current density;	VF = 0.335 V	SMD TO-277A(SMPC)	
<a href="#">SS3P6L</a>	NEW	Low VF, high current density;	VF = 0.478 V	SMD TO-277A(SMPC)	

## HVAC Climate Control : Sensors, Ambient Light Sensors

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### Optical

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">TEMD5510FX01</a>		Ambient Light Sensor Top View SMD analog photodiode output	540nm 1.0uA at 100 Lux CIE	Top View	AECQ
<a href="#">TEMD6010FSX1</a>		Ambient Light sensor SMD 0805 analog photodiode output	540nm 0.04uA at 100 Lux CIE	SMD 1206	AECQ
<a href="#">TEMD6200FX01</a>		Ambient Light sensor SMD 0805 analog photodiode output	540nm 0.04uA at 100 Lux CIE	SMD 0805	AECQ
<a href="#">TEMT6000FX01</a>		Ambient Light sensor SMD 1206 analog photodiode output	570nm 50uA at 100 Lux CIE	SMD 1206	AECQ
<a href="#">TEMT6200FX01</a>		Ambient Light sensor SMD 0805 analog photodiode output	550nm 50uA at 110 Lux CIE	SMD 0805	AECQ

# HVAC Climate Control : Sensors, Compartment Temperature

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## Thermistor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">1T1002-1</a>		Small dimension, conformal coated;	1K $\Omega$ - 100K $\Omega$ ; 1%; Beta = 3000 - 5000; 1%	TH / Radial	

# HVAC Climate Control : Sensors, Humidity Sensor

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## Humidity Sensor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">2381 691 90001</a>				SMD	

# HVAC Climate Control : Sensors, Outside Temperature

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## Thermistor

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">1T1002-1</a>		Small dimension, conformal coated;	1K $\Omega$ - 100K $\Omega$ ; 1%; Beta = 3000 - 5000; 1%	TH / Radial	

## HVAC Climate Control : Thermal Management, Analog Filtering

### Ceramic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">VJ...31/VJ...34 Automotive MLCC</a>		SMD Ceramic Capacitor Solutions High-Reliable NME Process Boardflex-Sensitive Applications	1.0pF...1μF 10Vdc ... 3000Vdc	SMD 0402...1812	

### Resistor Arrays

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">ACAS0612</a>		Thin film precision resistor array; pulse resistant, high stability;	100R - 221KΩ, 0.25%; ratio = 0.1%	SMD 1206	
<a href="#">CRA04S08</a>		Thick film resistor array;	10R - 1MΩ; 1%;	SMD 0805	
<a href="#">CRA06S08</a>		Thick film resistor array;	10R - 1MΩ; 1 %;	SMD 1206	

### Thin Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">TNPW0402</a>		Ultra-stable thin film technology; Pulse resistant;	10R - 100KΩ; 0.1% - 1%;	0402 0402	
<a href="#">TNPW0603</a>		Ultra-stable thin film technology; Pulse resistant;	10R - 332KΩ; 0.1% - 1%;	0603 0603	
<a href="#">TNPW0805</a>		Ultra-stable thin film technology; Pulse resistant;	10R - 1M0Ω; 0.1% - 1%;	0805 0805	
<a href="#">TNPW1206</a>		Ultra-stable thin film technology; Pulse resistant;	10R - 2MΩ; 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
<a href="#">SUM110N04-2m3L</a>		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
<a href="#">WSHM2818</a>		Power Metal Strip Shunts; Very High Power- Small Size; Low Thermal EMF;	R001...R1, 1% TCR $\pm$ 75ppm P70 = 7W	SMD 2818	AEC Q200
<a href="#">WSL3921</a>		Power Metal Strip Shunts; very low R-Value, very low TCR; low thermal EMF	R0002 - R04; 1 %; TCR $\pm$ 75ppm P70 = 3W	SMD 3921	AEC Q200
<a href="#">WSLT2512</a>		Power Metal Strip Shunt; High Temp. (275°C); Low TCR; low thermal EMF	R01 - R50; 1%; TCR $\pm$ 75ppm P70 = 1W	SMD 2512	AEC Q200

## HVAC Climate Control : Thermal Management, Seat Heating Control

### MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">SUM110N04-2m3L</a>		N-Channel, 40 V, very low rDS(on); very low switching loss, logic level;	N-Channel; 40V; rDS(on) = 0.0023Ohms;	SMD TO-252	
<a href="#">SUM110N06-05L</a>		N-Channel MOSFET low-side switch for 24-V Boardnet;	N-Channel; 60V, rDS(on) = 0.0052Ohms;	SMD TO-252	
<a href="#">SUM110P04-05</a>		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
<a href="#">WSL3921</a>		Power Metal Strip Shunts; very low R-Value, very low TCR; low thermal EMF;	R0002 - R04; 1 %; TCR $\pm$ 75ppm P70 = 3W	SMD 3921	AEC Q200
<a href="#">WSLT2512</a>		Power Metal Strip Shunt; High Temp. (275°C); Low TCR; low thermal EMF	R01 - R50; 1%; TCR $\pm$ 75ppm P70 = 1W	SMD 2512	AEC Q200
<a href="#">WSR-3</a>		Current Sense Power Metal Strip; High Power; Molded; low thermal EMF;	R001 - R2; 1 %; TCR $\pm$ 75ppm P70 = 3W	SMD 4527	AEC Q200

## HVAC Climate Control : User Interface, Backlight Control

### ESD Diodes

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">GL05T</a>		Low-capacitance ESD protection; data line protection;	Ppk = 300W; VRRM = 70V; Ippm = 17A	SMD SOT-23	
<a href="#">GL24T</a>		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
<a href="#">SQ7415EN</a>	NEW	Fully AEC Q-101 qualified; low thermal resistance, fast switching;	P-Channel; rDS(on) = 0.065Ohms;	SMD PowerPAK1212-8	AEC Q101
<a href="#">SUD50P10-43L</a>		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
<a href="#">ACAS0612</a>		Thin film precision resistor array; pulse resistant, high stability;	100R - 221KΩ, 0.25%; ratio = 0.1%	SMD 1206	
<a href="#">CRA04S08</a>		Thick film resistor array;	10R - 1MΩ; 1%;	SMD 0805	
<a href="#">CRA06E&amp;S</a>		Thick film resistor array;	10R - 1MΩ; 1 %;	SMD 1206	
<a href="#">CRA12E&amp;S</a>		Thick film resistor array;	10R - 1MΩ; 1%;	SMD 1206	
<a href="#">CSC01</a>		Single-in-line (SIP) resistor networks; Thick-Film Technology, Coated;	10R - 2M2; 1%	TH / SIP Network	
<a href="#">CSC03</a>		Single-in-line (SIP) resistor networks; Thick-Film Technology, Coated;	10R - 2M2; 1%	TH / SIP Network	
<a href="#">CSC05</a>		Single-in-line (SIP) resistor networks; Thick-Film Technology, Coated;	10R - 2M2; 1%	TH / SIP Network	
<a href="#">PR100.135,182</a>		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
<a href="#">SR5</a>		Open-air sense resistor	5 W, R004 - R05; 1%;	TH / Radial	
<a href="#">WSR-2</a>		Current Sense Power Metal Strip; High Power; Molded;	R001 - 1R; 1 %; TCR ± 75ppm P70 = 2W	SMD 4527	AEC Q200
<a href="#">WSR-3</a>		Current Sense Power Metal Strip; High Power; Molded;	R001 - R2; 1 %; TCR ± 75ppm P70 = 3W	SMD 4527	AEC Q200
<a href="#">WSR-5</a>		Current Sense Power Metal Strip; High Power; Molded;	R001 - R03; 1 %; TCR ± 75ppm P70 = 5W	SMD 4527	AEC Q200
<a href="#">WSZ6720</a>	NEW	Low-cost wire-wound, cement coating;	R10 - 15KΩ; 1 %; TCR <= 50ppm;	SMD 6720	
<a href="#">WSZ7532</a>	NEW	Low-cost wire-wound, silicone coating High surge current	P = 3.75 W; 1R - 15KΩ; Tol. = 1%, 3%, 5%, 10 %;	SMD 7532	

### Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">CRCW0402</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10MΩ; 1%;	SMD 0402	

Product Name	Status	Description	Features	Package	Q-Level
			TCR = 100		
<a href="#">CRCW0603</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0603	
<a href="#">CRCW0805</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0805	
<a href="#">CRCW1206</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 1206	
<a href="#">CRCW1210</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 1210	
<a href="#">CRCW2010</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 2010	
<a href="#">CRCW2512</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 2512	
<a href="#">RCA2010</a>	NEW	Automotive grade; sulfur resistant Termination Thick-Film Technology	1R - 10M $\Omega$ ; 1 %; TCR < = 100ppm	SMD 2010	
<a href="#">RCA2512</a>	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
<a href="#">BZG04-xx</a>		Reference voltage or overvoltage protection; surge current specified	V <sub>F</sub> = 1V or 2V; V <sub>R</sub> = 8.2V - 220V	SMD DO-214 AC	
<a href="#">BZX85-Series</a>		Reference voltage or overvoltage protection; surge current specified	T <sub>j</sub> = 175 °C; V <sub>z</sub> = 2.5V - 98V	TH / Axial DO41	
<a href="#">SMZGnnB</a>		Power voltage-regulating diode; glass passivated chip, low impedance;	V <sub>z</sub> = 9.1V - 68V; I <sub>R</sub> = 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
<a href="#">GL05T</a>		Low-capacitance ESD protection; data line protection;	Ppk = 300W; VRRM = 70V; Ippm = 17A	SMD SOT-23	
<a href="#">GL24T</a>		Low-capacitance ESD protection; data line protection;	Ppk = 300W; VRRM = 70V; Ippm = 5A	SMD SOT-23	

### Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">CRCW0402</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0402	
<a href="#">CRCW0603</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0603	
<a href="#">CRCW0805</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 0805	
<a href="#">CRCW1206</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 1206	
<a href="#">CRCW1210</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 1210	
<a href="#">CRCW2010</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10M $\Omega$ ; 1%; TCR = 100	SMD 2010	
<a href="#">CRCW2512</a>		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
<a href="#">SM5 A27</a>		High surge, low VF, low leakage; high reliability;	VBR = 27V; IFSM = 500A;	SMD DO-218 AB	
<a href="#">SM8 A27</a>		High surge, low VF, low leakage; high reliability;	VBR = 27V; IFSM = 700A;	SMD DO-218 AB	

# HVAC Climate Control : User Interface, LED Driver

## MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">Si2318CDS</a>	NEW	N-Channel 40V (D-S) MOSFET	rDS(on) = 0.042Ohms ID=5.6A	SMD TO-236 (SOT-23)	
<a href="#">SQ2309ES</a>	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
<a href="#">SQ7415EN</a>	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
<a href="#">WSL0603</a>		Power Metal Strip Shunts; Very Low R Value; Very Low TCR; low thermal EMF;	R01 - R1; 1 %; TCR ± 75ppm P70 = 0.1W	SMD 0603	AEC Q200
<a href="#">WSL0805</a>		Power Metal Strip Shunts; Very Low R Value; Very Low TCR; low thermal EMF;	R005 - R2; 1 %; TCR ± 75ppm P70 = 0.125W	SMD 0805	AEC Q200

## Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">CRCW0402</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10MΩ; 1%; TCR = 100	SMD 0402	
<a href="#">CRWC0603</a>		Bulk resistors, pulse resistant; good long term stability;	1R - 10MΩ; 1%; TCR = 100	SMD 0603	
<a href="#">CRWC0805</a>		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
<a href="#">BZG04-xx</a>		Reference voltage or overvoltage protection; surge current specified	VF = 1V or 2V; VR = 8.2V - 220V	SMD DO-214 AC	
<a href="#">BZX85-Series</a>		Reference voltage or overvoltage protection; surge current specified	Tj = 175 °C; Vz = 2.5V - 98V	TH / Axial DO41	
<a href="#">SMZGnnB</a>		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
<a href="#">VLME2300 -GS08</a>		AllnGaP on GaAs; luminous intensity categorized; yellow, 60°	56 mcd - 112 mcd; (typical 10 mA), 590 nm;	SMD MiniLED 2.3x1.3x1.4mm	AECQ
<a href="#">VLME310x -GS08</a>		AllnGaP on GaAs; luminous intensity categorized; yellow , 60°	28 mcd - 140 mcd; (typical 10mA); 581 nm - 594 nm	SMD PLCC-2	AECQ
<a href="#">VLMF2300 -GS08</a>		AllnGaP on GaAs; luminous intensity categorized; orange, 60°	56 mcd - 112 mcd; (typical 10mA); 610 nm;	SMD MiniLED 2.3x1.3x1.4mm	AECQ
<a href="#">VLMF310x -GS08</a>		AllnGaP on GaAs; luminous intensity categorized; soft orange, 60°	28 mcd - 112 mcd; (typical 10mA); 598 nm - 611 nm	SMD PLCC-2	AECQ
<a href="#">VLMK2300 -GS08</a>		AllnGaP on GaAs; luminous intensity categorized; red , 60°	35.5 mcd - 90 mcd; (typical 10mA); 643 nm;	SMD MiniLED 2.3x1.3x1.4mm	AECQ
<a href="#">VLMK310x -GS08</a>		AllnGaP on GaAs; luminous intensity categorized; red , 60°	11.2 mcd - 90 mcd; (typical 10mA); 543 nm - 630 nm	SMD PLCC-2	AECQ
<a href="#">VLMO31xx-GS08</a>		GaAsP on GaP; luminous intensity categorized; soft orange, 60°	4.5 mcd - 18 mcd; (typical 10mA); 598 nm - 611 nm	SMD PLCC-2	AECQ
<a href="#">VLMW41</a>		White LED with typical color temperature of 500°K, cool white	Luminous intensity from 180 to 450 mcd 11 binning options	SMD PLCC-2	AECQ

## HVAC Climate Control : User Interface, Rotary Encoder

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### Transmissive Sensors

Product Name	Status	Description	Features	Package	Q-Level
<a href="#">TCUT1300X01</a>	NEW	Subminiature, dual-channel, transmissive optical sensor w. phototransistor output RoHS compliant solder profile	VR = 5 V; IF = 25mA; Pv = 75mW;	SMD	