

## Product Summary

$V_{RRM}$ (V)	$I_o$ (A)	$V_F$ Typ (V) @ +25°C	$t_{RR}$ Typ (ns) @ +25°C	$I_{RM}$ Typ (A) @ +25°C
600	10	2.5	15	1.7

## Description and Application

The 10A, 600V DIODES™ DSR10F600P rectifier is designed specifically for use as a boost diode in power factor correction (PFC) applications. Its soft, very fast switching characteristics make it ideal for use in hard switching and continuous conduction mode (CCM) PFC circuits. It can be used in:

- High Power SMPS
- Servers and Telecom Equipment
- Flat-Panel TVs

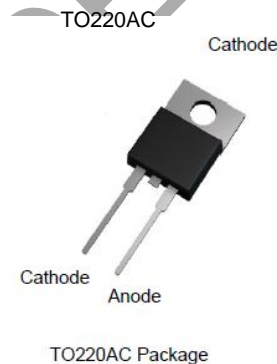
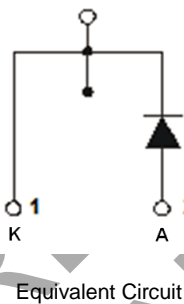
## Features and Benefits

- Very Fast  $t_{RR}$  Reduces MOSFET PFC Switching Losses
- Soft Switching Ensures Ringing and EMI are Reduced
- Low  $Q_{RR}$  and  $I_{RM}$  Minimize Boost Diode Recovery Losses
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative.**

<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Case: TO220AC
- Case Material: Molded Plastic, Green Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 <sup>Ⓔ</sup>
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 1.75 grams (Approximate)

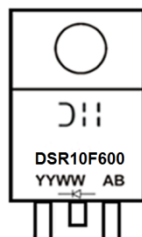


## Ordering Information (Note 4)

Part Number	Case	Packaging
DSR10F600P	TO220AC (Type E) TO220AC (Type HE) (Future Release)	50 Pieces/Tube

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



ⓁⓂ = Manufacturer's Marking  
 DSR10F600 = Product Type Marking Code  
 AB = Foundry and Assembly Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 21 = 2021)  
 WW = Week (01 to 53)

**Maximum Ratings** (@ $T_A = +25^{\circ}\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	$V_{RRM}$	600	V
Working Peak Reverse Voltage	$V_{RWM}$		
DC Blocking Voltage	$V_{RM}$		
Average Rectified Output Current (Note 6)	$I_O$	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	$I_{FSM}$	90	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	29	$^{\circ}\text{C/W}$
Typical Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	56	$^{\circ}\text{C/W}$
Typical Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	6	$^{\circ}\text{C/W}$
Typical Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	11	$^{\circ}\text{C/W}$
Storage Temperature Range	$T_{STG}$	-55 to +175	$^{\circ}\text{C}$
Maximum Operating Junction Temperature	$T_J$	+175	$^{\circ}\text{C}$

Notes: 5. Device free standing no heat sink.  
6. Device is mounted on a 20mm × 70mm × 19.8mm Al heat sink.

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**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Voltage	V <sub>BR</sub>	600	—	—	V	I <sub>R</sub> = 50μA
Forward Voltage Drop	V <sub>F</sub>	—	2.5	3.2	V	I <sub>F</sub> = 10A, T <sub>J</sub> = +25°C
		—	1.7	—		I <sub>F</sub> = 10A, T <sub>J</sub> = +125°C
		—	1.5	—		I <sub>F</sub> = 10A, T <sub>J</sub> = +150°C
Leakage Current (Note 7)	I <sub>R</sub>	—	0.5	20	μA	V <sub>R</sub> = 600V, T <sub>J</sub> = +25°C
		—	12	—		V <sub>R</sub> = 600V, T <sub>J</sub> = +125°C
		—	40	—		V <sub>R</sub> = 600V, T <sub>J</sub> = +150°C
Junction Capacitance	C <sub>T</sub>	—	26	—	pF	V <sub>R</sub> = 10V, f = 1MHz
Reverse Recovery Time	t <sub>RR</sub>	—	15	30	ns	I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1.0A, I <sub>RR</sub> = 0.25A
		—	26	—		I <sub>F</sub> = 1A, di/dt = 50A/μs, V <sub>R</sub> = 30V, T <sub>J</sub> = +25°C
		—	18	—		I <sub>F</sub> = 1A, di/dt = 100A/μs, V <sub>R</sub> = 30V, T <sub>J</sub> = +25°C
		—	52	—		I <sub>F</sub> = 10A, di/dt = 200A/μs, V <sub>R</sub> = 400V, T <sub>J</sub> = +25°C
		—	75	—		I <sub>F</sub> = 10A, di/dt = 200A/μs, V <sub>R</sub> = 400V, T <sub>J</sub> = +125°C
Reverse Recovery Current (Note 7)	I <sub>RM</sub>	—	1.7	—	A	I <sub>F</sub> = 10A, di/dt = 200A/μs, V <sub>R</sub> = 400V, T <sub>J</sub> = +25°C
		—	3.8	—		I <sub>F</sub> = 10A, di/dt = 200A/μs, V <sub>R</sub> = 400V, T <sub>J</sub> = +125°C
Reverse Recovery Charge	Q <sub>RR</sub>	—	43	—	nC	I <sub>F</sub> = 10A, di/dt = 200A/μs, V <sub>R</sub> = 400V, T <sub>J</sub> = +25°C
		—	140	—		I <sub>F</sub> = 10A, di/dt = 200A/μs, V <sub>R</sub> = 400V, T <sub>J</sub> = +125°C

Note: 7. Short duration pulse test used to minimize self-heating effect.

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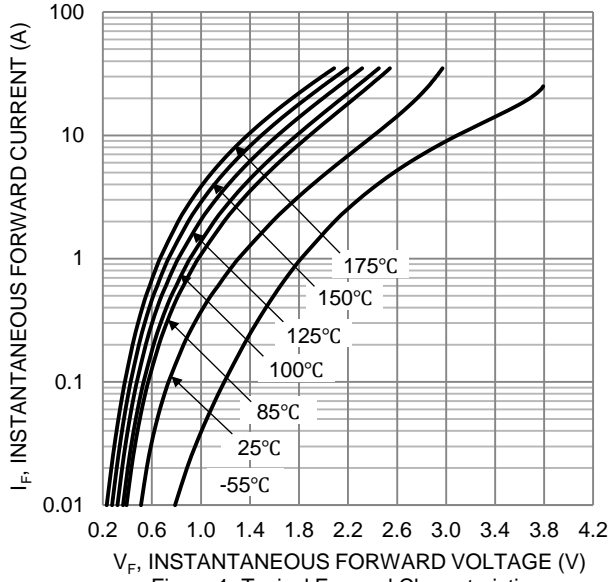


Figure 1. Typical Forward Characteristics

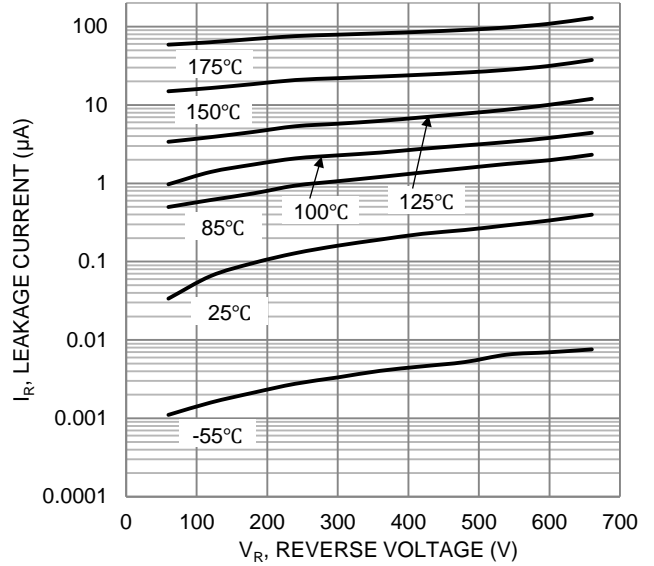


Figure 2. Typical Reverse Characteristics

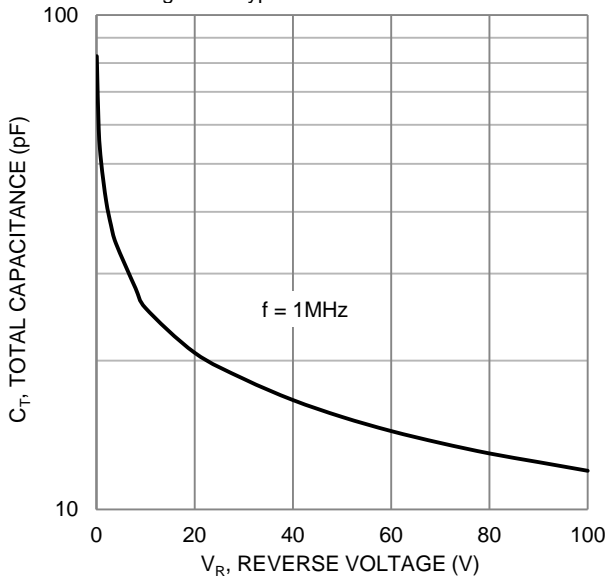


Figure 3. Total Capacitance vs. Reverse Voltage

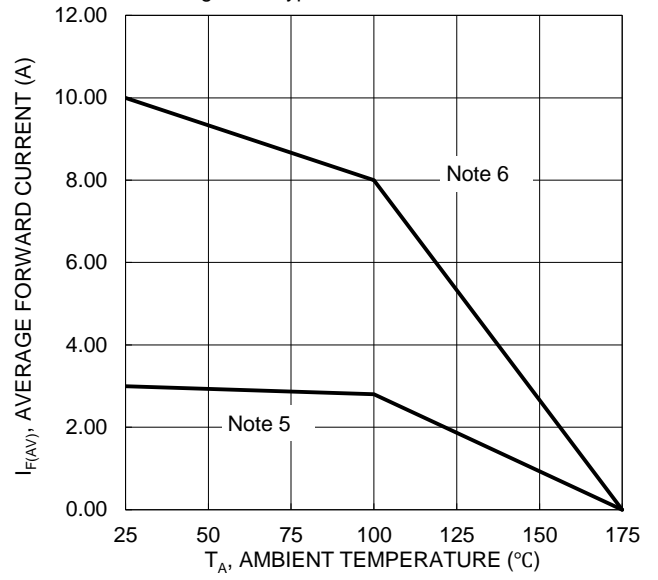


Figure 4. Forward Current Derating Curve

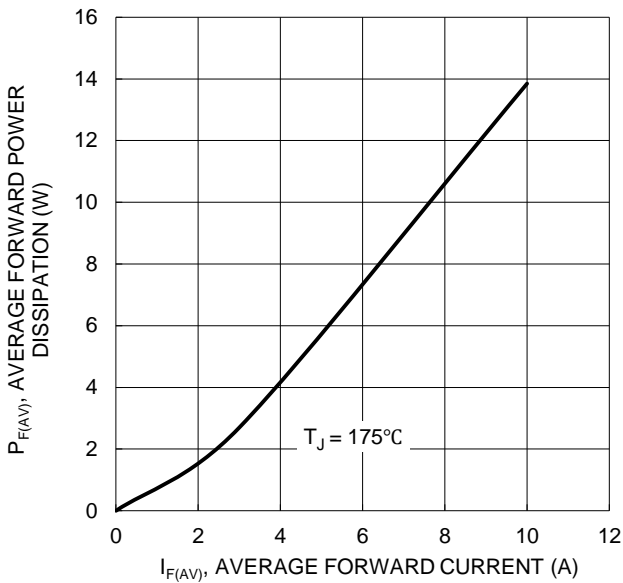


Figure 5. Forward Power Dissipation

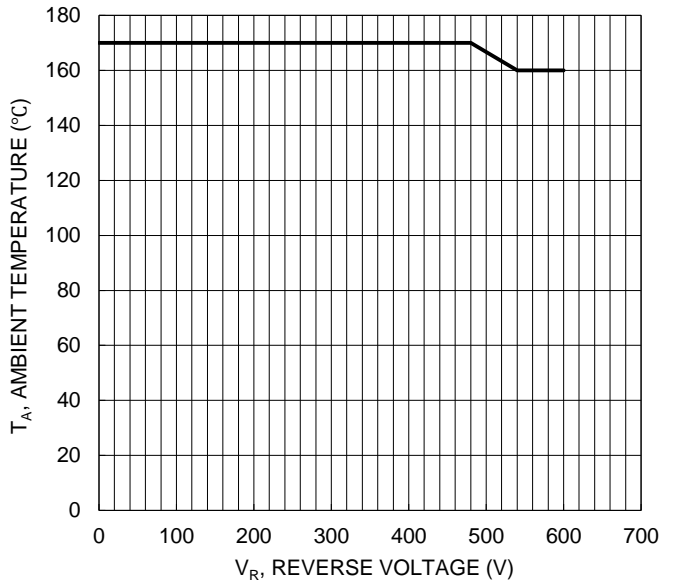
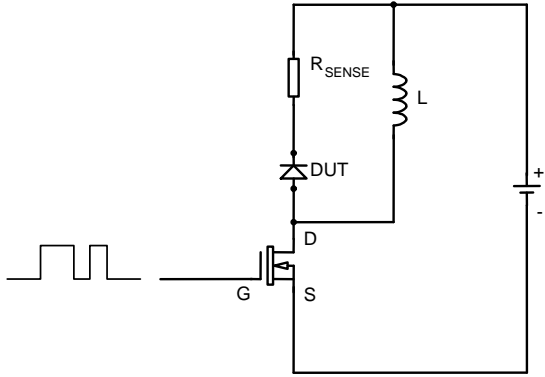
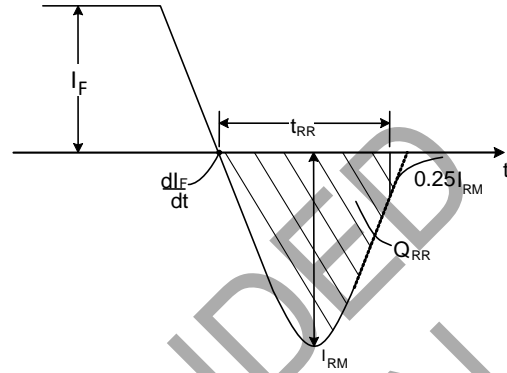


Figure 6. Operating Temperature Derating Curve

**Test Circuit and Waveform Definitions**



$t_{RR}$  Test Circuit



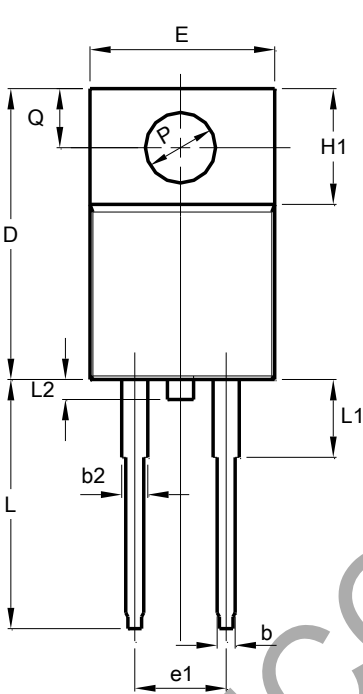
$t_{RR}$  Waveform and Definitions

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**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**TO220AC (Type E)**



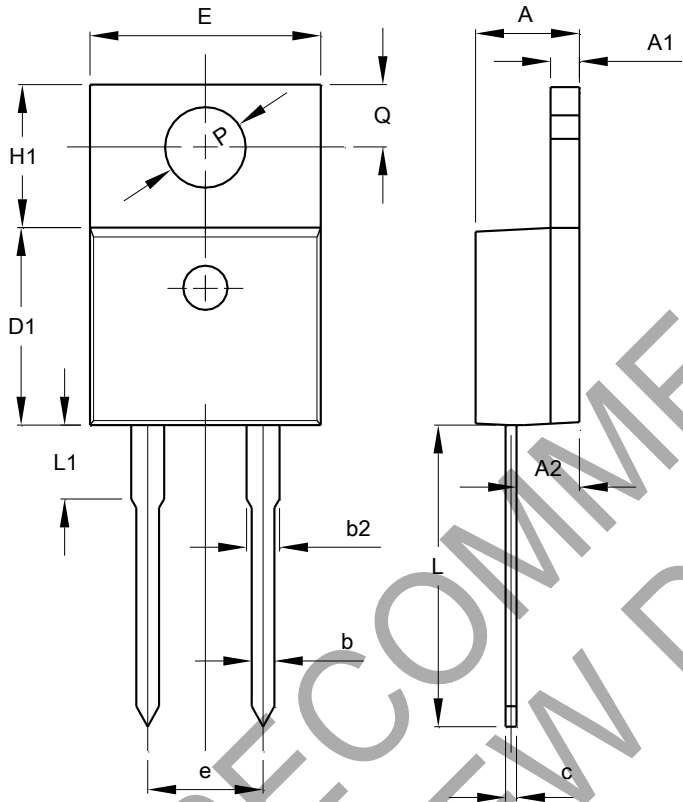
TO220AC (Type E)			
Dim	Min	Max	Typ
A	4.40	4.82	--
A1	1.10	1.40	--
A2	2.05	2.92	--
b	0.72	1.00	--
b2	1.16	1.45	--
c	0.36	0.68	--
D	14.70	15.87	--
e1	--	--	5.08
E	9.80	10.26	--
H1	5.80	6.40	--
L	12.70	13.96	--
L1	3.56	4.50	--
L2	-	1.30	--
P	3.70	3.90	--
Q	2.54	3.30	--
All Dimensions in mm			

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**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**TO220AC (Type HE) (Future Release)**



TO220AC (Type HE)			
Dim	Min	Max	Typ
A	4.37	4.77	4.57
A1	1.22	1.42	1.27
A2	2.49	2.89	2.69
b	0.76	0.91	0.81
b2	1.17	1.47	1.27
c	0.30	0.48	0.38
D1	8.50	8.90	8.70
e	5.08 BSC		
E	9.86	10.36	10.16
H1	6.10	6.50	6.30
L	13.10	13.70	13.40
L1	--	4.10	3.75
PØ	3.70	3.99	3.84
Q	2.54	2.94	2.74
All Dimensions in mm			

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