

POWER[®]
INTEGRATIONS

Product Summary

$I_{F(AVG)}$ per diode	15	A
V_{RRM}	300	V
Q_{RR} (Typ at 125 °C)	47	nC
I_{RRM} (Typ at 125 °C)	2.7	A
Softness t_b/t_a (Typ at 125 °C)	0.7	

The image shows a 3D perspective of a TO-247 AD package, which is a power transistor package. It has three leads labeled A1, K, and A2. The package is mounted on a heatsink, labeled K (Backside Heatsink). Below the package is its circuit symbol, which consists of two diodes connected to a common terminal K. The diodes are labeled A1 and A2.

Package uses Lead-free plating and Green mold compound Halogen free per IEC 61249-2-21.

Absolute maximum ratings are the values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Symbol	Parameter	Conditions	Rating	Units
V _{RRM}	Peak repetitive reverse voltage		300	V
I _{F(AVG)}	Average forward current	Per Diode, T _J = 150 °C, T _C = 108 °C	15	A
		Per Device, T _J = 150 °C, T _C = 108 °C	30	A
I _{FSM}	Non-repetitive peak surge current	Per Diode, 60 Hz, ½ cycle	100	A
I _{FSM}	Non-repetitive peak surge current	Per Diode, ½ cycle of t = 28 μs Sinusoid, T _C = 25 °C	350	A
T _J	Maximum junction temperature		150	°C
T _{STG}	Storage temperature		–55 to 150	°C
	Lead soldering temperature	Leads at 1.6mm from case, 10 sec	300	°C
P _D	Power dissipation	T _C = 25 °C	65.8	W

Symbol	Resistance from:	Conditions	Rating	Units
R _{θJA}	Junction to ambient	Per Device	40 (Typ)	°C/W
R _{θJC}	Junction to case	Per Diode	1.9	°C/W
		Per Device	0.95	°C/W

This device has the lowest Q_{RR} of any 300V Silicon diode. Its recovery characteristics increase efficiency, reduce EMI and eliminate snubbers.

- AC/DC and DC/DC output rectification
 - Output & freewheeling diodes
- Motor drive circuits
- DC-AC inverters

- Low Q_{RR} , Low I_{RRM} , Low t_{RR}
- High dI_F/dt capable (1000A/ μ s)
- Soft recovery

- Increases efficiency
 - Eliminates need for snubber circuits
 - Reduces EMI filter component size & count
- Enables extremely fast switching

Electrical Specifications at $T_J = 25\text{ }^{\circ}\text{C}$ (unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units	
DC Characteristics							
I _R	Reverse current per diode	V _R = 300 V, T _J = 25 °C	-	-	25	μA	
		V _R = 300 V, T _J = 125 °C	-	0.45	-	mA	
V _F	Forward voltage per diode	I _F = 15 A, T _J = 25 °C	-	1.6	1.9	V	
		I _F = 15 A, T _J = 150 °C	-	1.4	-	V	
C _J	Junction capacitance per diode	V _R = 10 V, 1 MHz	-	50	-	pF	
Dynamic Characteristics							
t _{RR}	Reverse recovery time, per diode	dI _F /dt =200 A/μs V _R =200, I _F =15 A	T _J =25 °C	-	13	-	ns
			T _J =125 °C	-	26	-	ns
Q _{RR}	Reverse recovery charge, per diode	dI _F /dt =200 A/μs V _R =200, I _F =15 A	T _J =25 °C	-	12.5	16	nC
			T _J =125 °C	-	47	-	nC
I _{RRM}	Maximum reverse recovery current, per diode	dI _F /dt =200 A/μs V _R =200, I _F =15 A	T _J =25 °C	-	1.5	1.9	A
			T _J =125 °C	-	2.7	-	A
S	Softness per diode= $\frac{t_b}{t_a}$	dI _F /dt =200 A/μs V _R =200, I _F =15 A	T _J =25 °C	-	0.7	-	
			T _J =125 °C	-	0.7	-	

Note to component engineers: Q-Series diodes employ Schottky technologies in their design and construction. Therefore, component engineers should plan their test setups to be similar to traditional Schottky test setups. (For further details, see application note AN-300.)

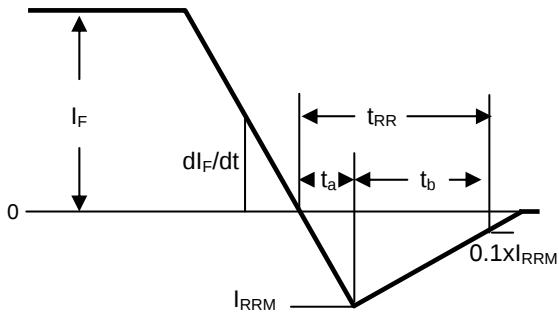


Figure 1. Reverse Recovery Definitions

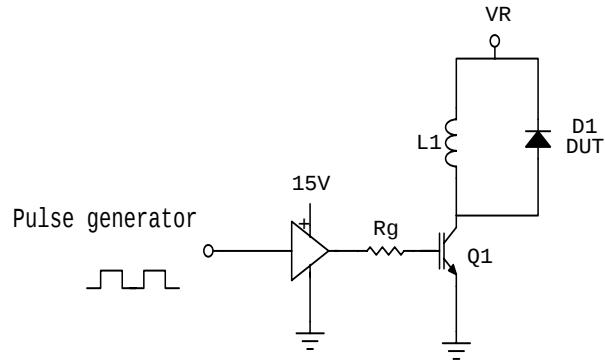


Figure 2. Reverse Recovery Test Circuit

Electrical Specifications at $T_J = 25\text{ }^{\circ}\text{C}$ (unless otherwise specified)

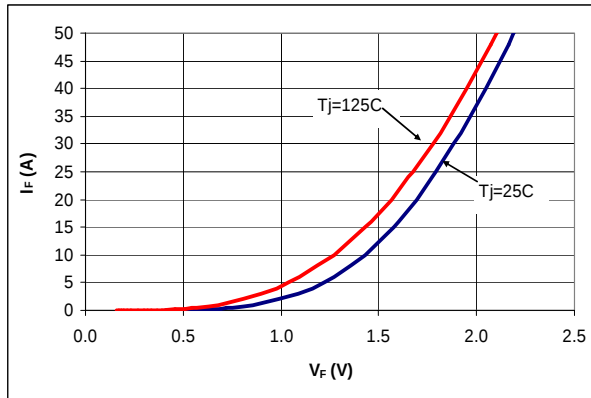


Figure 3. Typical I_F vs V_F

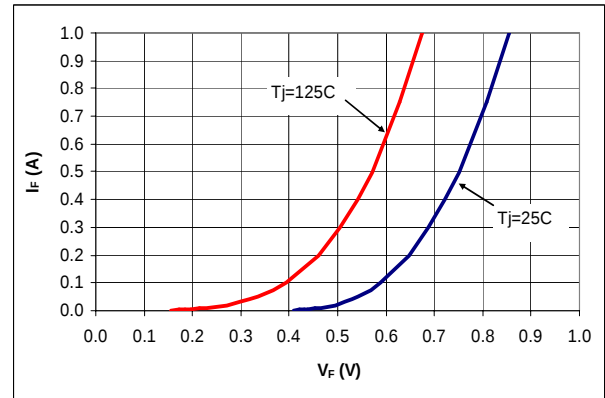


Figure 4. Typical I_F vs V_F

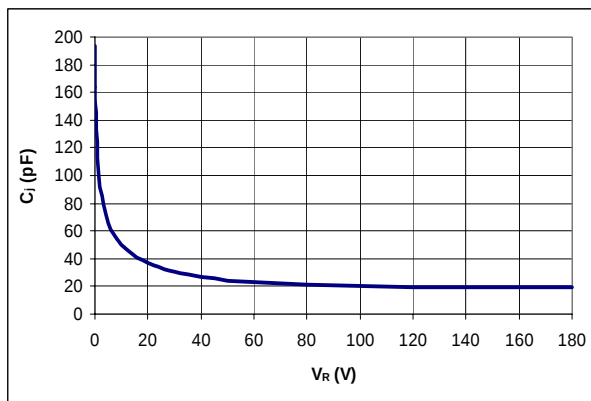


Figure 5. Typical C_j vs V_R

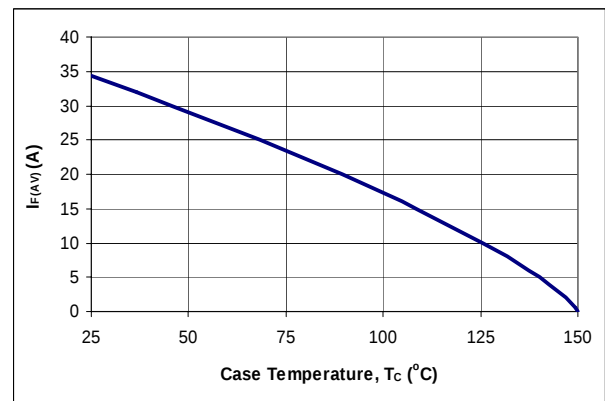


Figure 6. DC Current Derating Curve

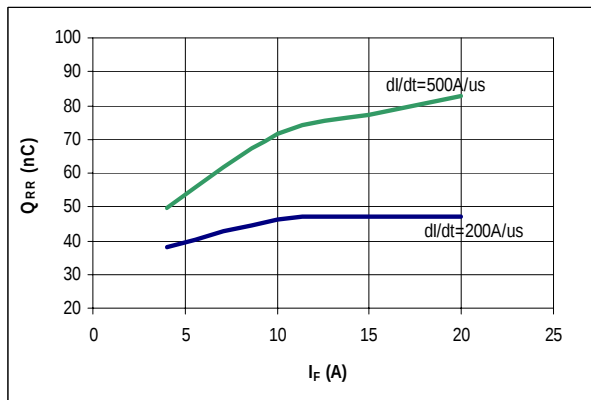


Figure 7. Typical Q_{RR} vs I_F at $T_J = 125\text{ }^{\circ}\text{C}$

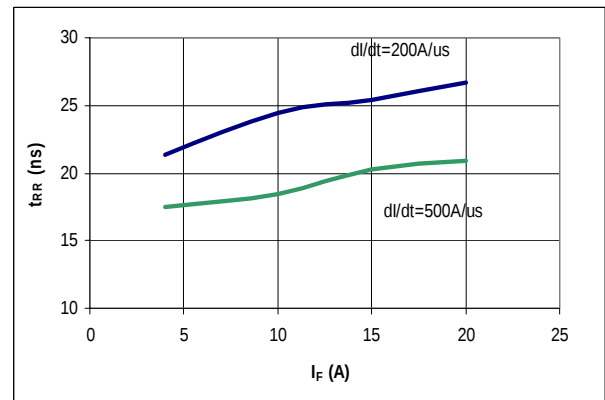


Figure 8. Typical t_{RR} vs I_F at $T_J = 125\text{ }^{\circ}\text{C}$

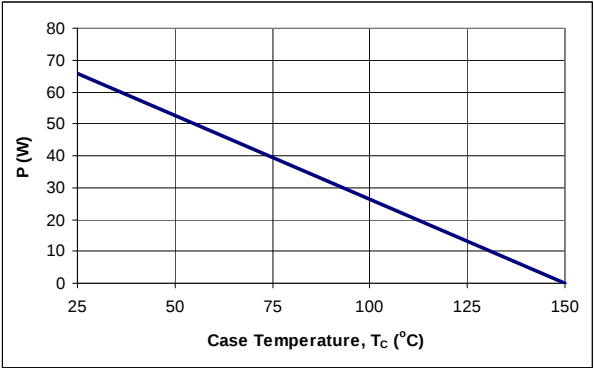


Figure 9. Power Derating Curve

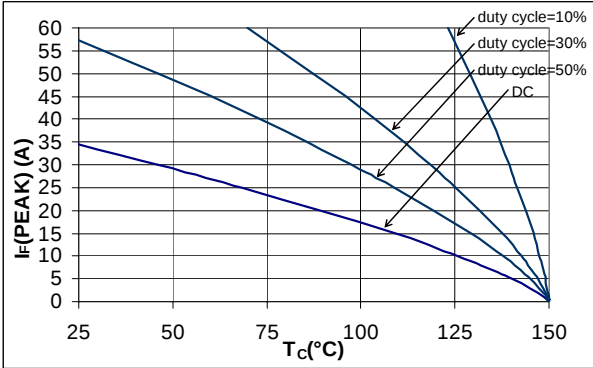


Figure 10. IF(Peak) vs TC, f=70 kHz

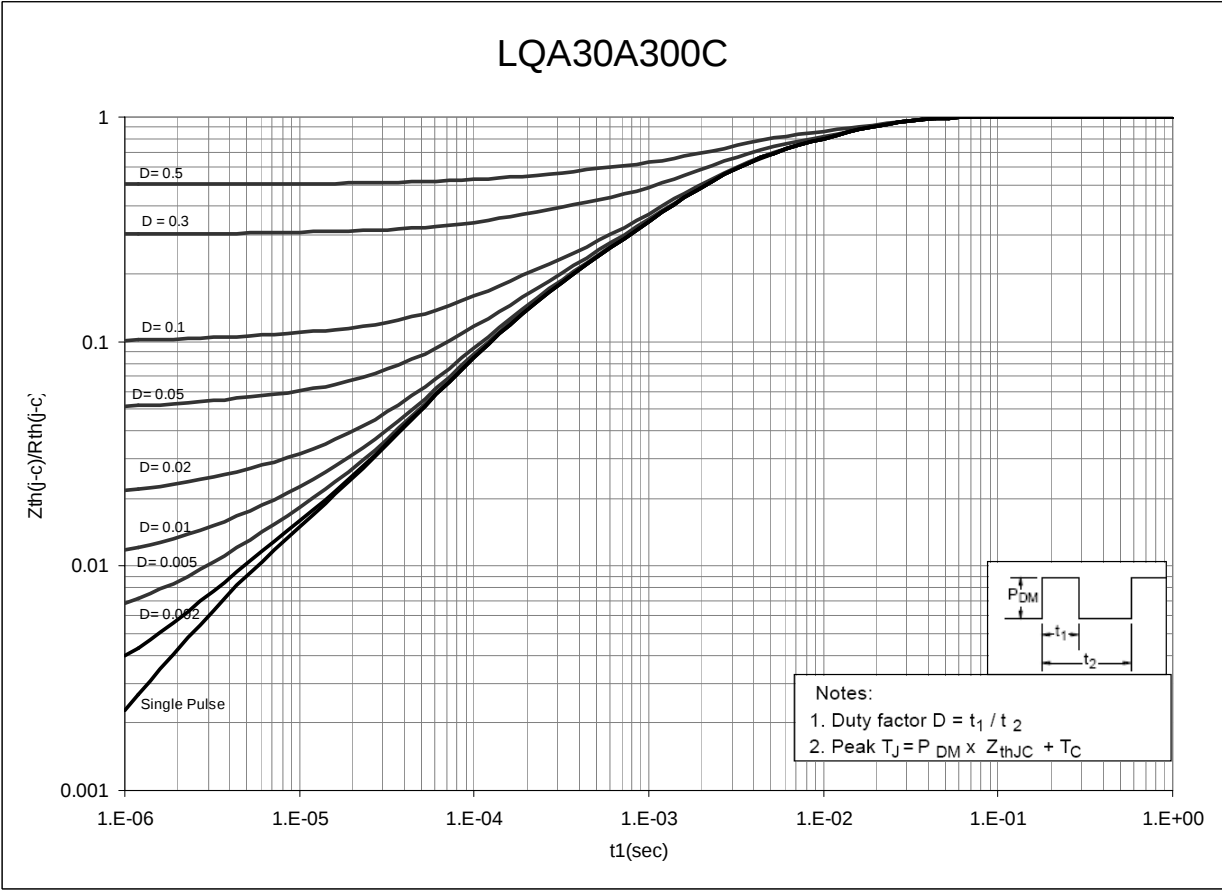
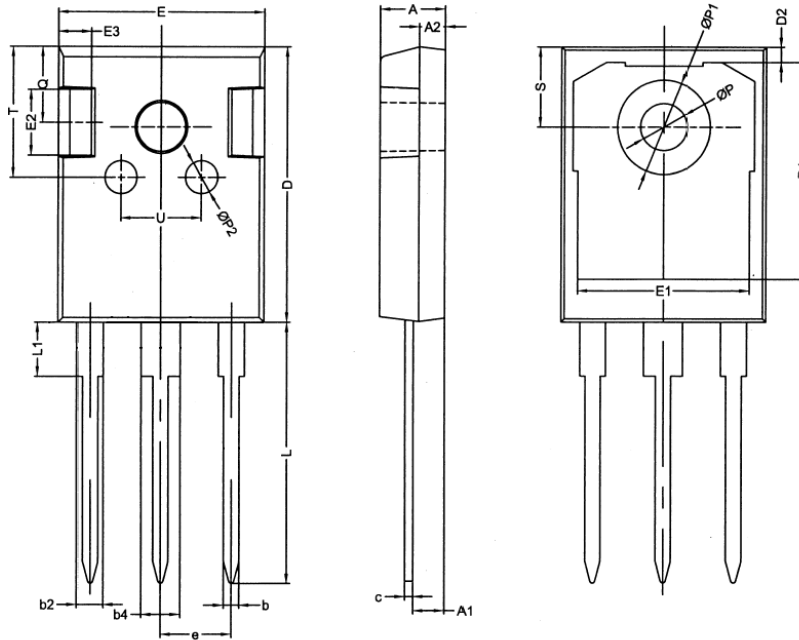


Figure 11. Normalized Maximum Transient Thermal Impedance

Dimensional Outline Drawings

TO-247 AD



Dim	Millimeters	
	MIN	MAX
A	4.90	5.10
A1	2.31	2.51
A2	1.90	2.10
b	1.16	1.26
b2	1.96	2.06
b4	2.96	3.06
c	0.59	0.66
D	20.90	21.10
D1	16.25	16.85
D2	1.05	1.35
E	15.70	15.90
E1	13.10	13.50
E2	4.90	5.10
E3	2.40	2.60
e	5.44BSC	
L	19.80	21.10
L1	-	4.30
ØP	3.50	3.70
ØP1	-	7.40
ØP2	2.40	2.60
Q	5.60	6.00
S	6.15BSC	
T	9.80	10.20
U	6.00	6.40

Mechanical Mounting Method	Maximum Torque / Pressure specification
Screw through hole in package tab	1 Newton Meter (nm) or 8.8 inch-pounds (lb-in)
Clamp against package body	12.3 kilogram-force per square centimeter (kgf/cm ²) or 175 lbf/in ²

Soldering time and temperature: This product has been designed for use with high-temperature, lead-free solder. The component leads can be subjected to a maximum temperature of 300 °C, for up to 10 seconds. See Application Note AN-303, for more details.

Ordering Information

Part Number	Package	Packing
LQA30A300C	TO-247	30 units/tube

The information contained in this document is subject to change without notice.

Revision	Notes	Date
1.0	Released by Qspeed	08/09
1.1	Converted to Power Integrations Document	01/11

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