

LQ20N200CQ

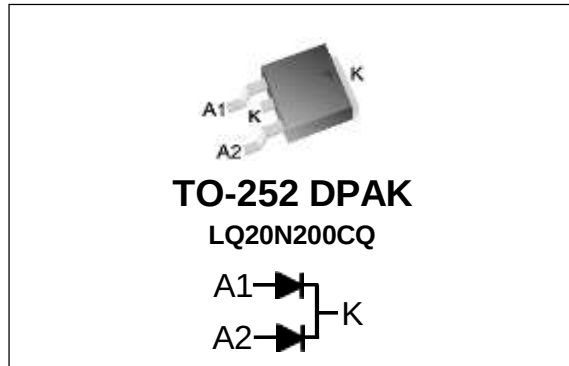
Qspeed™汽车产品系列

适用于汽车音响应用的
200V/20A 共阴极二极管

产品概览

$I_{F(AVG)}$ (每个二极管)	10	A
V_{RRM}	200	V
Q_{RR} (125° C 下典型值)	48.4	nC
I_{RRM} (125° C 下典型值)	3.29	A
软度 t_b/t_a (125° C 下典型值)	0.34	

引脚分配



符合 RoHS 标准

封装采用无铅电镀和符合 IEC 61249-2-21 指令的“绿色环保”无卤模封料。

概述

该器件在所有 200V 硅二极管中具有最低的 Q_{RR} 。其恢复特性能提高效率、降低 EMI 并省去缓冲电路。

支持的应用场景

- 汽车
 - 符合 AEC-Q101 标准
 - 晶圆厂、组装厂和测试厂均通过 IATF 16949 认证
 - ESD HBM 测试等级分类为 H0

特性

- 低 Q_{RR} 、低 I_{RRM} 、低 t_{RR}
- 软恢复

优势

- 提高效率
 - 无需缓冲电路
 - 可缩减 EMI 滤波元件的尺寸和数量
- 可实现极快速开关

绝对最大额定值

绝对最大额定值是指一旦超过就可能使器件受损或缩短其使用寿命的极限值。不建议在此类条件下进行功能性工作。

符号	参数	条件	额定值	单位
V_{RRM}	峰值重复反向电压	$T_J = 25^\circ\text{C}$	200	V
$I_{F(AVG)}$	平均正向导通电流	每个二极管, $T_J = 150^\circ\text{C}$, $T_C = 124^\circ\text{C}$	10	A
		每个器件, $T_J = 150^\circ\text{C}$, $T_C = 124^\circ\text{C}$	20	A
I_{FSM}	非重复峰值浪涌电流	每个二极管, 60Hz, 1/2周期	100	A
I_{FSM}	非重复峰值浪涌电流	每个二极管, $t = 28\mu\text{s}$ 正弦的1/2周期, $T_C = 25^\circ\text{C}$	350	A
T_J	工作结温范围		-40 至 150	$^\circ\text{C}$
T_{STG}	存储温度		-55 至 150	$^\circ\text{C}$
	引线焊接温度	引线距壳体 1.6mm, 10 秒	300	$^\circ\text{C}$
P_D	功耗	$T_C = 25^\circ\text{C}$	41.7	W

热阻

符号	热阻, 从:	条件	额定值	单位
R _{θJC}	结至壳体	每个二极管	3.0	° C/W
		每个器件	1.5	° C/W

电气规格, $T_J = 25^\circ\text{C}$ (除非另有指定)

符号	参数	条件	最小值	典型值	最大值	单位	
每个二极管的 DC 特性							
I _R	每个二极管的反向电流	V _R = 200V, T _J = 25℃	-	-	500	μA	
		V _R = 200V, T _J = 125℃	-	0.35	-	mA	
V _F	每个二极管的正向电压	I _F = 10A, T _J = 25℃	-	0.98	1.15	V	
		I _F = 10A, T _J = 150℃	-	0.85	-	V	
C _J	每个二极管的结电容	V _R = 10V, 1MHz	-	38	-	pF	
每个二极管的动态特性							
t _{RR}	每个二极管的反向恢复时间	dI _F /dt = 200A/μs V _R = 130V, I _F = 10A	T _J = 25℃	-	16	-	ns
			T _J = 125℃	-	23.5	-	ns
Q _{RR}	每个二极管的反向恢复电荷	dI _F /dt = 200A/μs V _R = 130V, I _F = 10A	T _J = 25° C	-	20	32	nC
			T _J = 125℃	-	48.4	-	nC
I _{RRM}	每个二极管的最大反向恢复电流	dI _F /dt = 200A/μs V _R = 130V, I _F = 10A	T _J = 25℃	-	2.1	3.05	A
			T _J = 125℃	-	3.29	-	A
S	每个二极管的软度 = $\frac{t_b}{t_a}$	dI _F /dt = 200A/μs V _R = 130V, I _F = 10A	T _J = 25℃	-	0.41	-	
			T _J = 125℃	-	0.34	-	

元件工程师注意事项： Q 系列二极管的设计和结构采用肖特基技术。因此，元件工程师应规划其测试方法，使其与传统的肖特基测试方法类似。

(详细信息请参考应用指南 AN-300。)

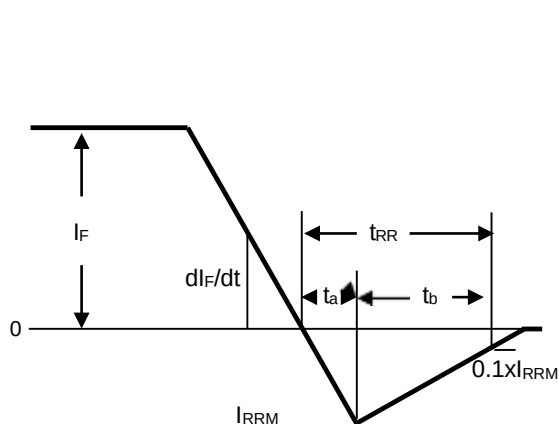


图 1. 反向恢复定义

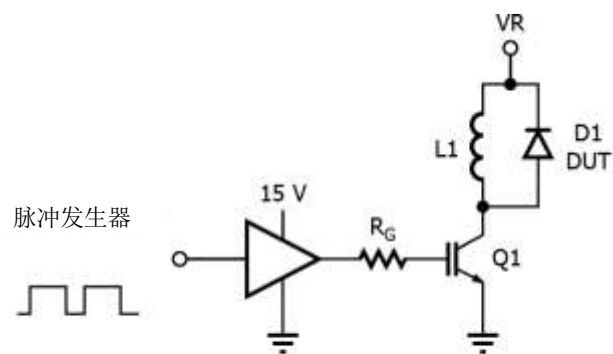


图 2. 反向恢复测试电路

PI-7614-041315

电气规格, $T_J = 25^\circ\text{C}$ (除非另有指定)

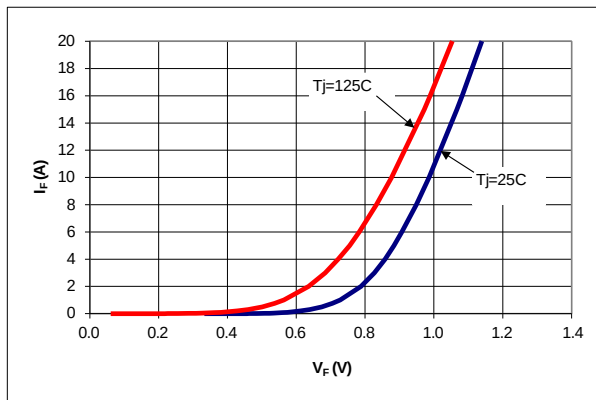


图 3. 典型 I_F 相对于 V_F 的变化

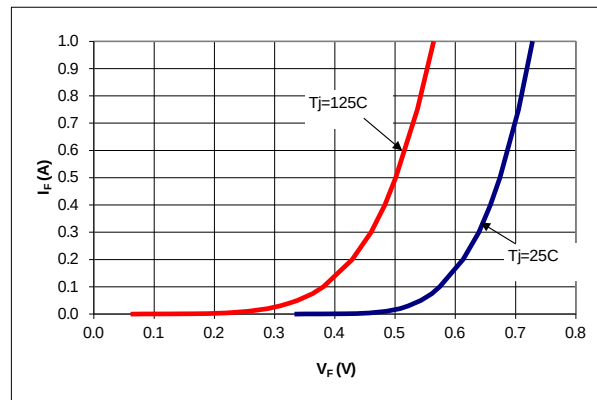


图 4. 典型 I_F 相对于 V_F 的变化

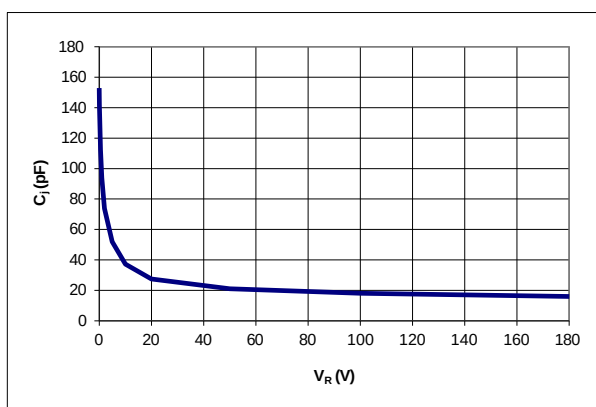


图 5. 典型 C_J 相对于 V_R 的变化

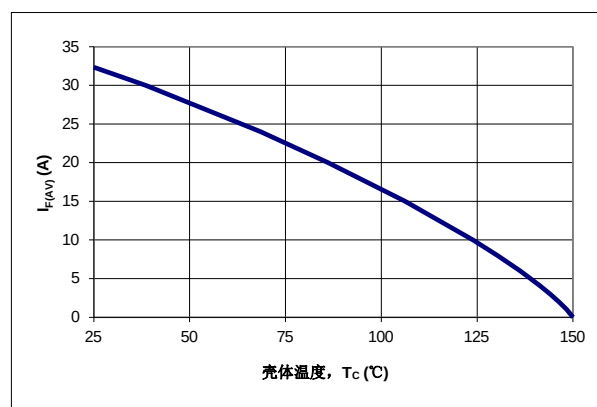


图 6. DC 电流降额曲线

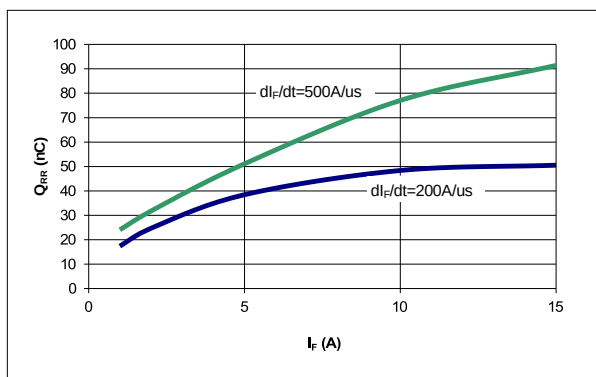


图 7. 典型 Q_{RR} 相对于 I_F 的变化, $T_J = 125^\circ\text{C}$

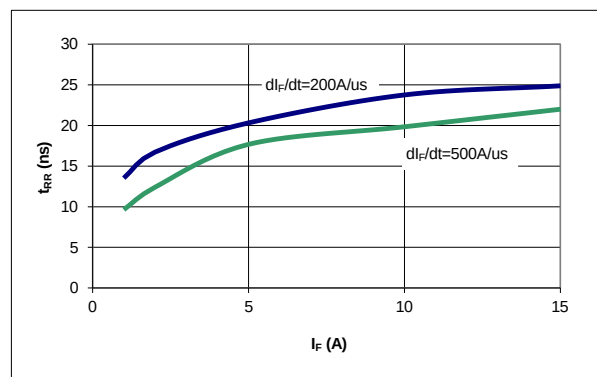


图 8. 典型 t_{RR} 相对于 I_F 的变化, $T_J = 125^\circ\text{C}$

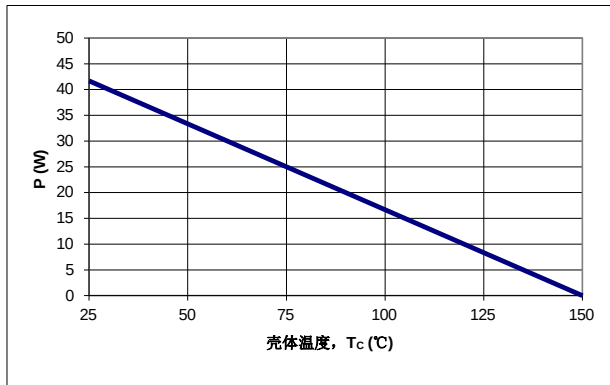


图 9. 功率降额曲线

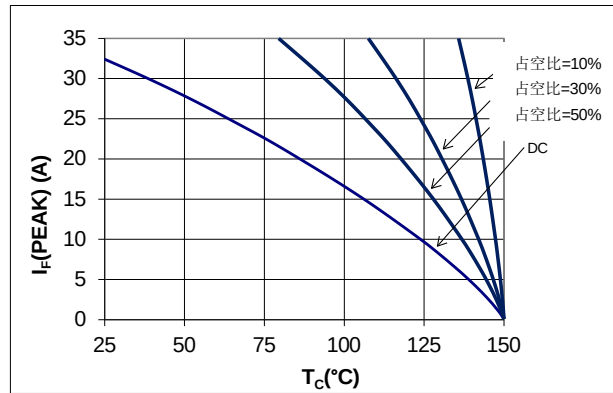


图 10. $I_F(\text{PEAK})$ 相对于 T_C 的变化, $f = 70\text{kHz}$

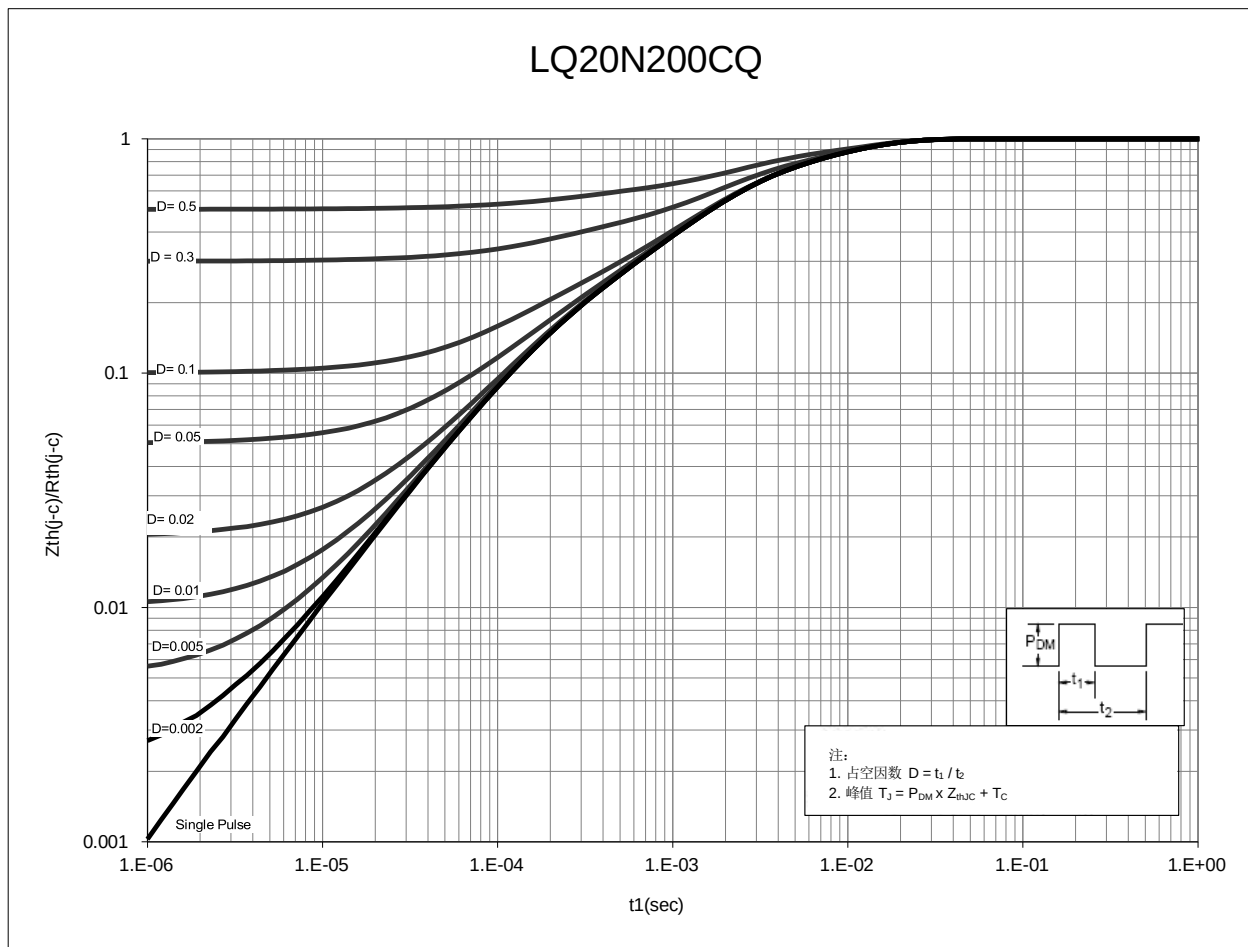
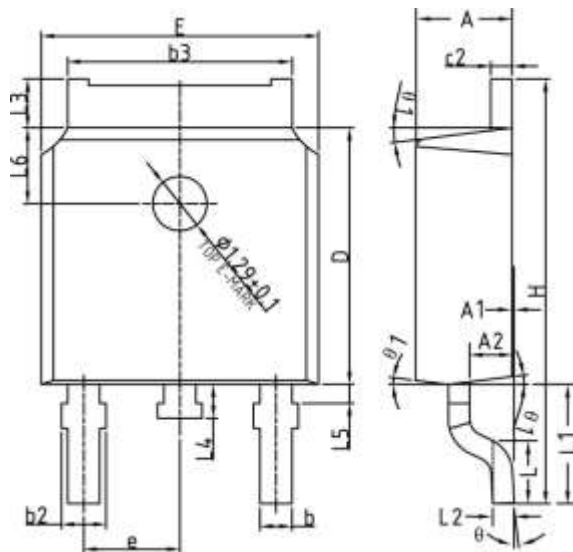


图 11. 归一化最大动态热阻抗

外形尺寸图

TO-252 DPAK



尺寸	毫米(mm)	
	最小值	最大值
A	2.20	2.38
A1	0	0.10
A2	0.90	1.10
b	0.72	0.85
b2	0.72	0.90
b3	5.13	5.46
c2	0.47	0.60
D	6.00	6.20
E	6.50	6.70
e	2.186	2.386
H	9.80	10.40
L	1.40	1.70
L1	2.90 REF	
L2	0.51 BSC	
L3	0.90	1.25
L4	0.60	1.00
L5	0.15	0.75
L6	1.80 REF	
θ	0°	8°
$\theta 1$	5°	9°

焊接时间和温度：本产品经设计可用于高温、无铅焊接。元件引线可持续 10 秒承受 300℃ 的最高温度。更多详情请参考应用指南 AN-303。

元件订购信息

型号	封装	包装
LQ20N200CQ	TO-252 DPAK	2500 件/卷

本文档所提供的信息可能会发生变更，恕不另行通知。

修订版本	注释	日期
1.1	A 版本发布。	03/19

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