

2SK4145A

N-沟道场效应晶体管
60 V, 84 A, 10 mΩ

R07DS1080CC0100

Rev.1.00

2013 年 4 月 17 日

概述

2SK4145A 是一款为大电流开关应用而设计的 N-沟道场效应晶体管。

特性

- 低漏极/源极通态电阻

$$R_{DS(on)} = 10 \text{ m}\Omega \text{ 最大值 (} V_{GS} = 10 \text{ V, } I_D = 42 \text{ A)}$$

- 低输入电容值

$$C_{iss} = 3310 \text{ pF 典型值 (} V_{DS} = 10 \text{ V, } V_{GS} = 0 \text{ V)}$$

- 大电流

$$I_{D(DC)} = \pm 84 \text{ A}$$

- 符合 RoHS 规定

订购信息

订购型号	引脚镀层	包装	封装
2SK4145A-S19-AY/LMV * 1	纯锡（锡制）	管装 50 片/管	TO-220 2.0 g 典型值
2SK4145A-S19-AY/LCV * 1	纯锡（锡制）	管装 50 片/管	TO-220 2.0 g 典型值

注释： 1. 无铅 (本产品在外部电极不含有铅.)

绝对最大额定值

(Ta = 25°C)

参数	符号	额定值	单位
漏极/源极电压($V_{GS} = 0 \text{ V}$)	V_{DSS}	60	V
栅极/源极电压($V_{DS} = 0 \text{ V}$)	V_{GSS}	± 20	V
漏极电流(DC)	$I_{D(DC)}$	± 84	A
脉冲漏极电流 ^{注 1}	$I_{D(pulse)}$	± 215	A
总耗散功率($T_c = 25^\circ\text{C}$)	P_{T1}	84	W
总耗散功率($T_a = 25^\circ\text{C}$)	P_{T2}	1.5	W
容许沟道温度	T_{ch}	150	°C
储存温度	T_{stg}	-55 至 +150	°C
单脉冲雪崩电流 ^{注 2}	I_{AS}	36	A
单脉冲雪崩能量 ^{注 2}	E_{AS}	130	mJ

热阻值

沟道-外壳间热阻	$R_{th(ch-c)}$	1.49	°C/W
沟道-环境间热阻	$R_{th(ch-a)}$	83.3	°C/W

注： *1. $PW \leq 10 \mu\text{s}$, 占空比 $\leq 1\%$

*2. 起动 $T_{ch} = 25^\circ\text{C}$, $R_G = 25 \Omega$, $V_{DD} = 30 \text{ V}$, $V_{GS} = 20 \rightarrow 0 \text{ V}$, $L = 00 \mu\text{H}$

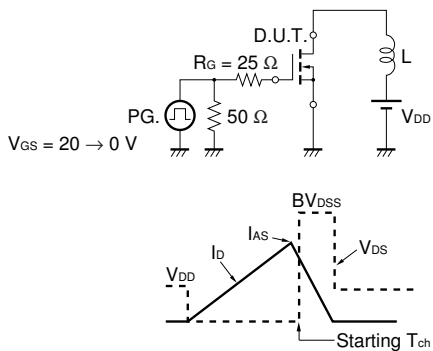
电特性

(Ta = 25°C)

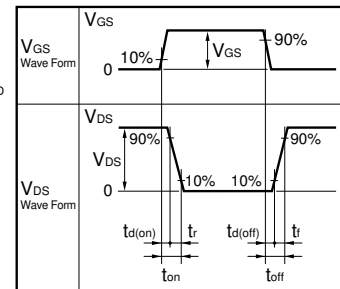
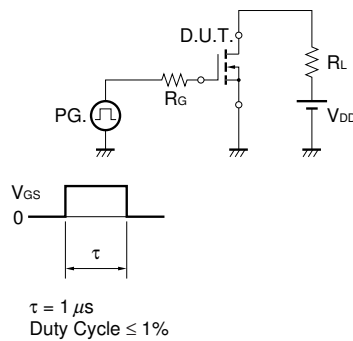
参数	符号	最小值	典型值	最大值	单位	测定条件
漏极截止电流	I_{DSS}			10	μA	$V_{DS} = 60 V, V_{GS} = 0 V$
栅极截止电流	I_{GSS}			± 100	nA	$V_{GS} = \pm 20 V, V_{DS} = 0 V$
栅极阈值电压	$V_{GS(off)}$	2.0	3.0	4.0	V	$V_{DS} = 10 V, I_D = 1 mA$
正向传输导纳 ^{注3}	$ y_{fs} $	16	36		S	$V_{DS} = 10 V, I_D = 30 A$
漏极/源极通态电阻 ^{注3}	$R_{DS(on)}$		7.2	10	m Ω	$V_{GS} = 10 V, I_D = 42 A$
输入电容	C_{iss}		3310		pF	$V_{DS} = 10 V,$ $V_{GS} = 0 V,$ $f = 1 MHz$
输出电容	C_{oss}		610		pF	
反向传输电容	C_{rss}		340		pF	
开启延迟时间	$t_{d(on)}$		19		ns	$V_{DD} = 30 V, I_D = 42 A,$ $V_{GS} = 10 V,$ $R_G = 0 \Omega$
上升时间	t_r		14		ns	
关断延迟时间	$t_{d(off)}$		59		ns	
下降时间	t_f		11		ns	
栅极充电电荷量	Q_G		66		nC	$V_{DD} = 48 V,$ $V_{GS} = 10 V,$ $I_D = 84 A$
栅极/源极充电电荷量	Q_{GS}		12		nC	
栅极/漏极充电电荷量	Q_{GD}		24		nC	
体二极管正向电压 ^{注3}	$V_{F(S-D)}$		1.0	1.5	V	$I_F = 84 A, V_{GS} = 0 V$
体二极管反向恢复时间	t_{rr}		44		ns	$I_F = 84 A, V_{GS} = 0 V,$ $di/dt = 100 A/\mu s$
体二极管反向恢复电荷	Q_{rr}		59		nC	

注: 3. 脉冲测试

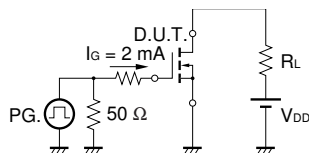
测试电路 1 抗雪崩能力



测试电路 2 开关时间

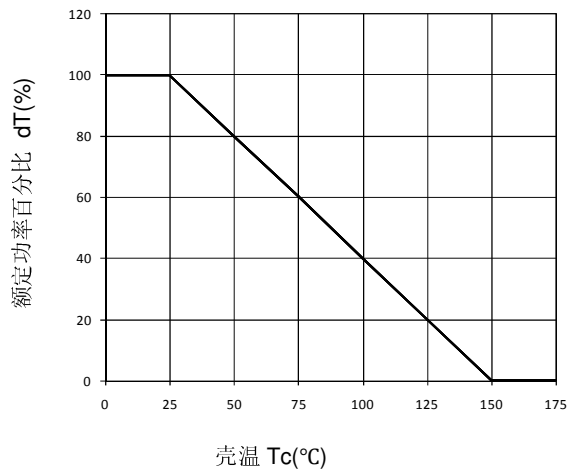


测试电路 3 栅极电荷量

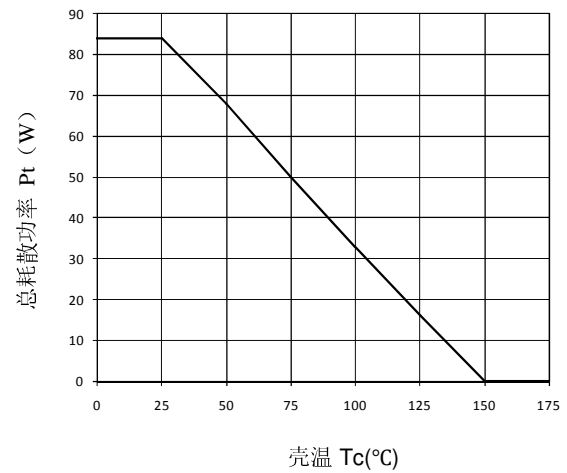


典型特性曲线($T_a = 25^\circ\text{C}$)

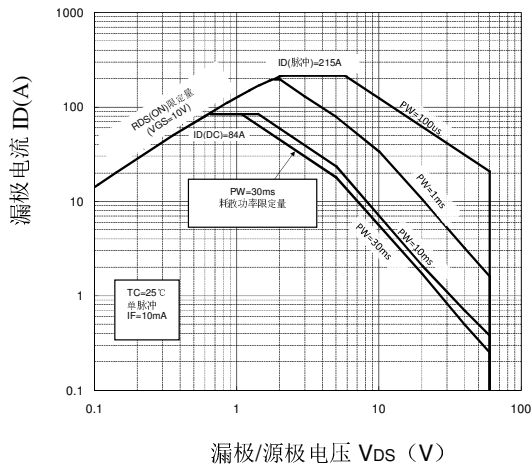
正向偏压安全工作区的降额系数



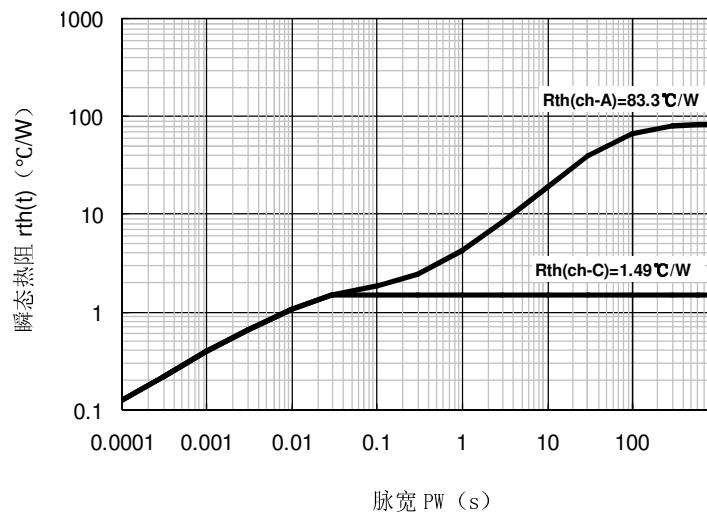
总耗散功率-壳温



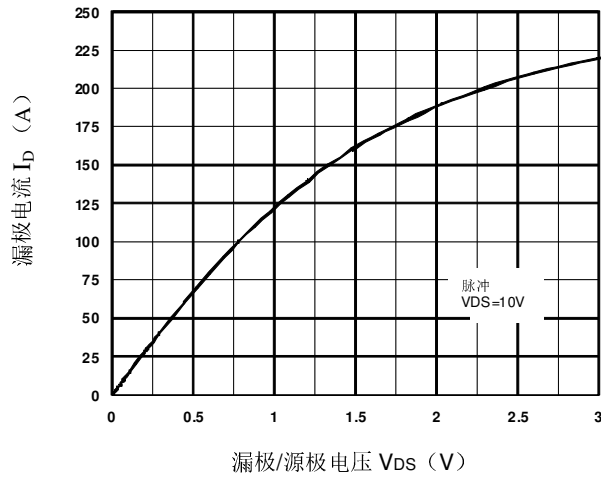
最大安全工作区域



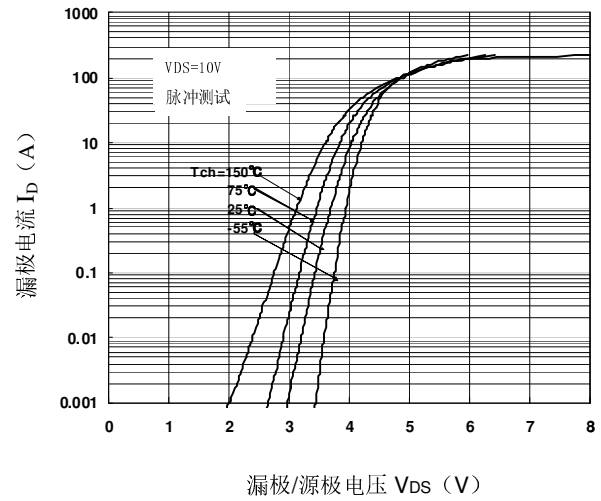
瞬态热阻值特性



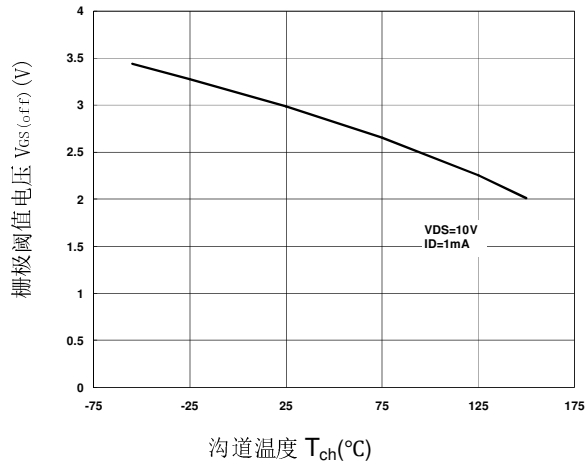
典型输出特性



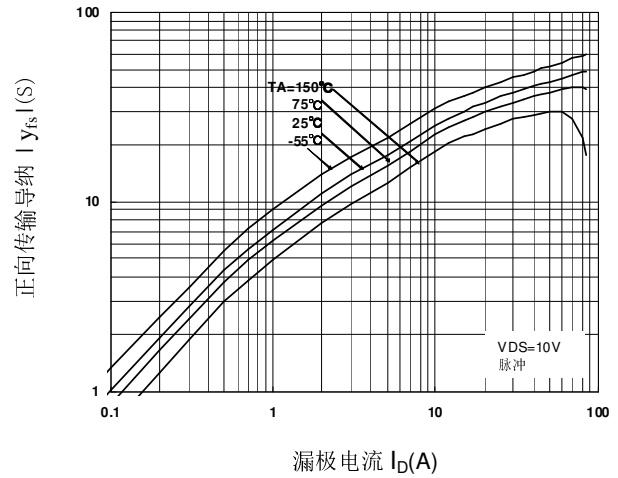
典型传输特性



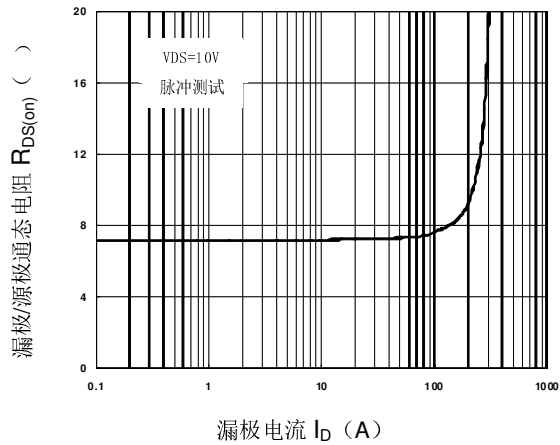
栅极阈值电压-沟道温度



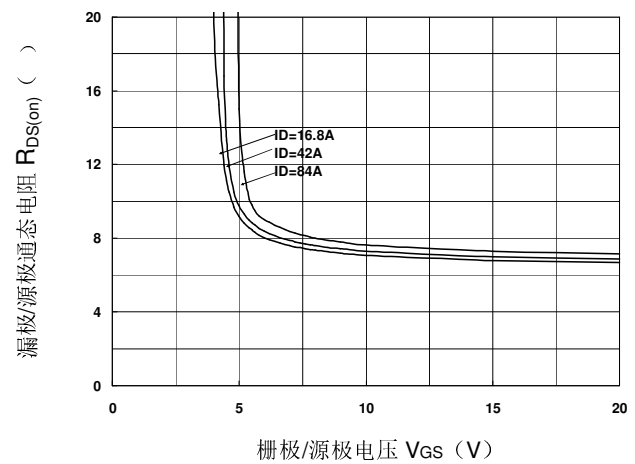
正向传输导纳-漏极电流



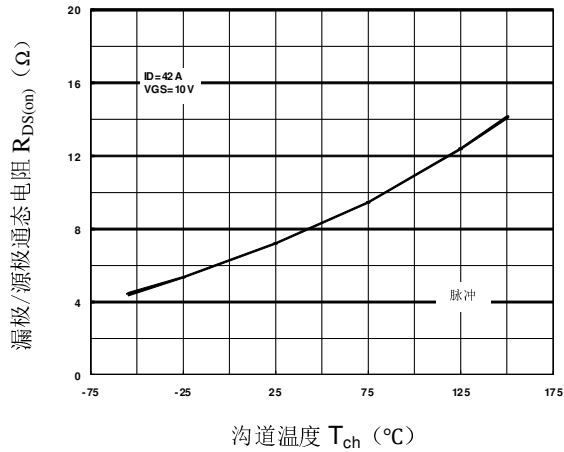
漏极/源极通态电阻-漏极电流



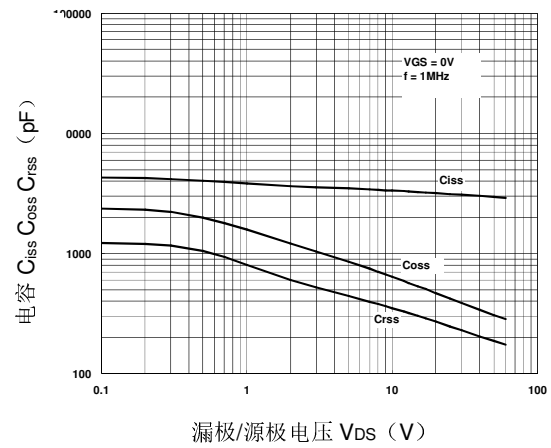
漏极/源极通态电阻-栅极/源极电压



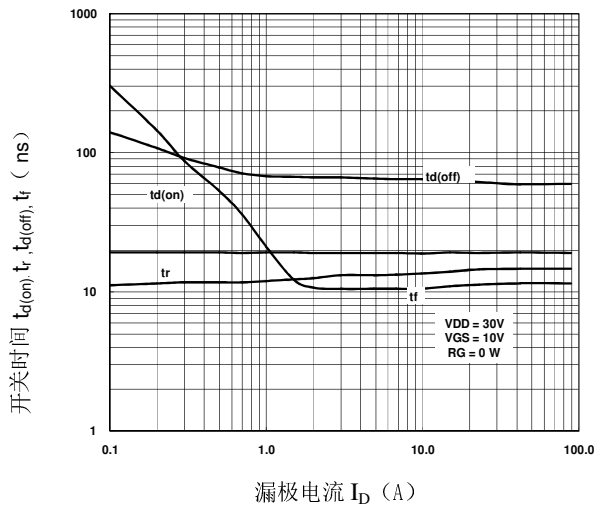
漏极/源极通态电阻-沟道温度



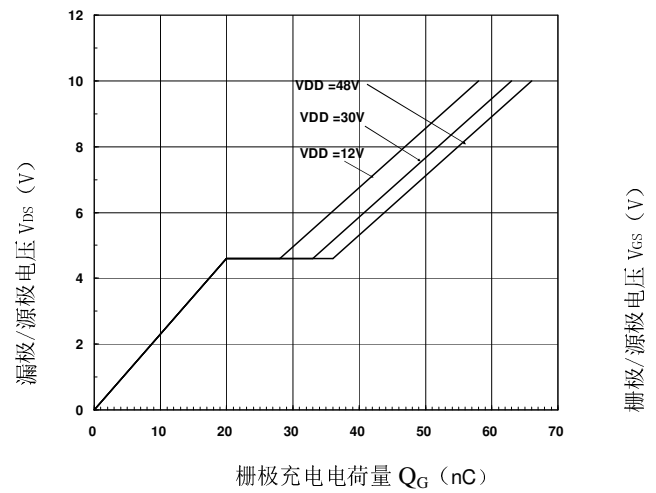
电容-漏极/源极电压



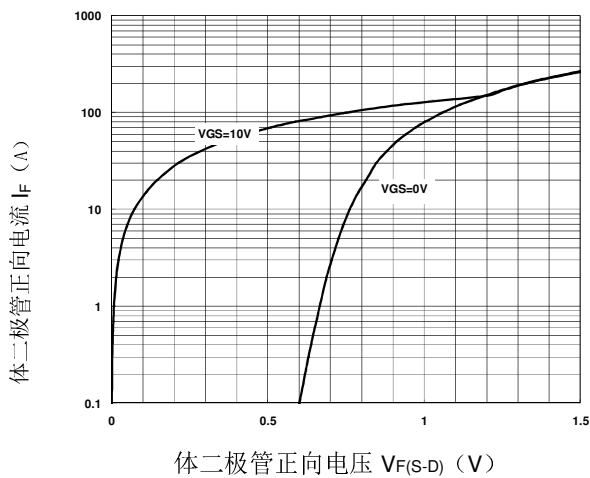
开关特性



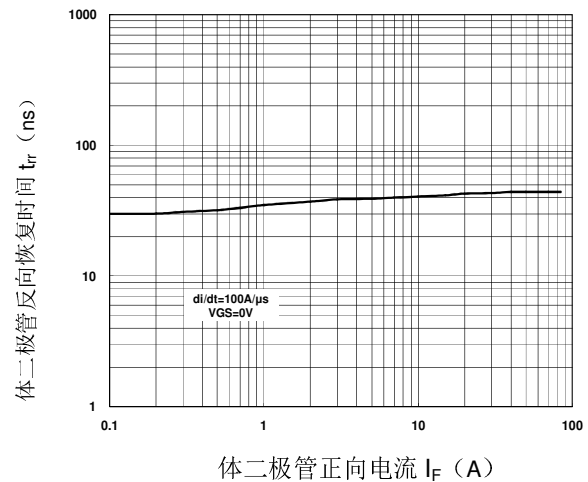
输入时序特性



体二极管正向电流-正向电压



体二极管反向恢复时间-正向电流



封装形式 (单位: mm)

TO-220

2SK4145A-S19-AY/LMV

The drawing shows a top view and a side view of the package. The top view includes dimensions E (width), P (pitch), H (height), D (height), B1 (width), B (width), G (width), L (length), L1 (length), and Q (width). The side view includes dimensions A (width), F (width), C (width), and J (width). Pin numbers 1, 2, 3, and 4 are indicated on the top view.

符号	2SK4145A		
	最小值	典型值	最大值
A			4.8
B	0.7	0.8	0.9
B1	1.07	1.27	1.47
C	0.3	0.5	0.7
D			15.5
E			10.4
F	1.1	1.3	1.5
G		2.54	
H	5.9		
J	2.4	2.6	2.8
L	12.7		
L1		3.5	
P	3.6	3.8	4
Q	2.5	2.8	3.1

- 1. 栅极
- 2. 漏极
- 3. 源极
- 4. 背片（漏极）

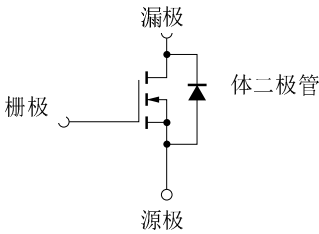
2SK4145A-S19-AY/LCV

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Q	2.5	2.8	3.1

- 1. 栅极
- 2. 漏极
- 3. 源极
- 4. 背片（漏极）

等效电路

	
注意事项 当本器件暴露到强电场时,可能会导致氧化栅极的破坏,并最终影响器件的运行。因此必须采取措施,尽可能防止静电产生。一旦有静电发生,必须立即释放。	

修订历史	2SK4145A 数据手册
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修订版	日期	描述	
		页码	概要
1.00	2012 年 9 月 21 日	—	第一版发行

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