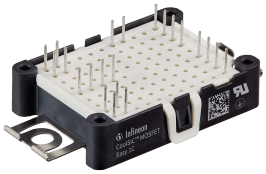
Final datasheet

EasyPACK™ 模块 采用 CoolSiC™ Trench MOSFET 带有 PressFIT 压接管脚和温度检测 NTC

特性



- 电气特性
  - V_{DSS} = 750 V
  - I_{DN} = 24 A / I_{DRM} = 72 A
  - 低电感设计
  - 低开关损耗
  - 高电流密度
  - 可以从下面链接寻找适合的英飞凌驱动 IC https://www.infineon.com/gdfinder
- 机械特性
  - PressFIT 压接技术
  - 集成 NTC 温度传感器
  - 集成的安装夹使安装坚固
  - 封装的 CTI > 600
  - 高电流压接管脚

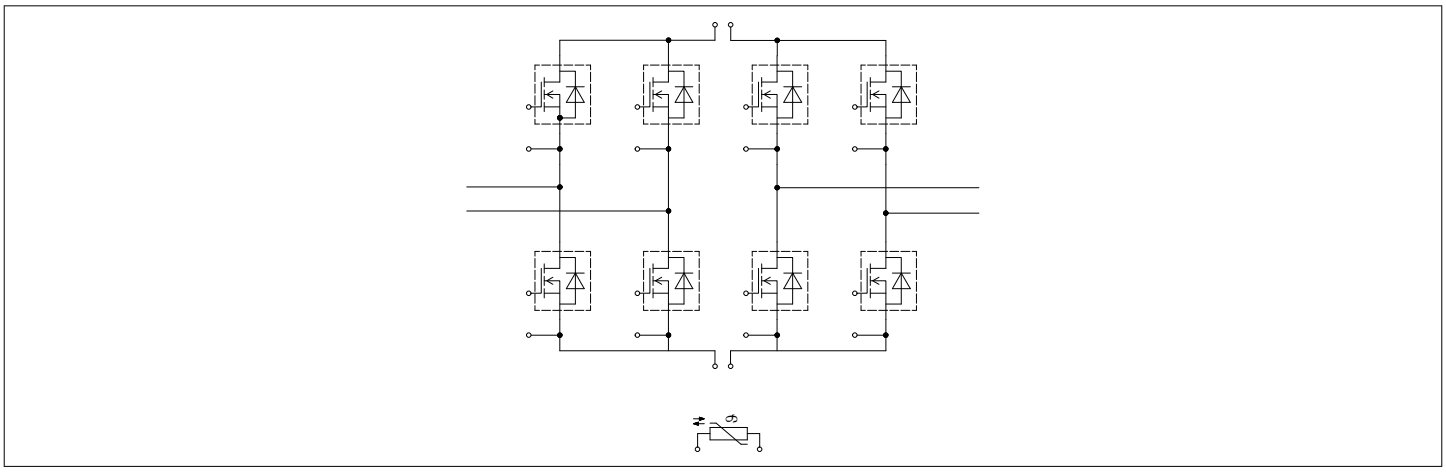
可选应用

- 高频开关应用
- DC/DC 变换器
- EV Auxiliaries
- 车载蓄电池充电机 - 混合动力/纯电动汽车

产品认证

- Qualified according to AQG 324, release no.: 03.1/2021

描述



内容

描述 1
特性 1
可选应用 1
产品认证 1
内容 2
1 封装 3
2 **MOSFET, T1-T4** 3
3 **Body diode (MOSFET, T1-T4)** 5
4 **MOSFET, T5-T8** 6
5 **Body diode (MOSFET, T5-T8)** 8
6 负温度系数热敏电阻 9
7 特征参数图表 10
8 电路拓扑图 23
9 封装尺寸 24
10 模块标签代码 25
修订历史 26
免责声明 27

1 封装

表 1 绝缘参数

特征参数	代号	标注或测试条件	数值	单位
绝缘测试电压	V_{ISOL}	RMS, f = 50 Hz, t = 1 min	4.0	kV
NTC 绝缘测试电压	$V_{ISOL(NTC)}$	RMS, f = 50 Hz, t = 1 min	3.0	kV
内部绝缘		基本绝缘 (class 1, IEC 61140)	Al_2O_3	
相对电痕指数	*CTI*		> 600	
相对温度指数 (电)	*RTI*	基壳	180	°C
		上盖	150	

表 2 特征值

特征参数	代号	标注或测试条件	数值			单位
			最小值	典型值	最大值	
杂散电感,模块	L_{sDS}			24		nH
模块引线电阻,端子-芯片	$R_{DD'+SS'}$	T_H = 25 °C, 每个开关		2.15		mΩ
储存温度	T_{stg}		-40		150	°C
Mounting force per clamp	*F*		20		50	N
重量	*G*			24		g

注: 单针脚到50 A 的电流耐受值受限于针脚与 PCB 设计及其散热条件之间的相互作用

2 MOSFET, T1-T4

表 3 最大标定值

特征参数	代号	标注或测试条件		数值	单位
漏源极电压	V_{DSS}		T_{vj} = 25 °C	750	V
植入漏极电流	I_{DN}			24	A
连续漏极直流电流	I_{DDC}	T_{vj} = 175 °C, V_{GS} = 18 V	T_H = 105 °C	24	A
漏极重复峰值电流	I_{DRM}	verified by design, t_p limited by T_{vjmax}		72	A
栅-源瞬态最大电压	V_{GS}	D < 0.01		-10/25	V
栅-源稳态最大电压	V_{GS}			-7/20	V

表 4 推荐值

特征参数	代号	标注或测试条件	[ZH]Values	单位
通态栅极电压	$V_{GS(on)}$		15...18	V
断态栅极电压	$V_{GS(off)}$		-5...0	V

表 5　　特征值

特征参数	代号	标注或测试条件		数值			单位
				最小值	典型值	最大值	
漏源通态电阻	$R_{DS(on)}$	I_D = 24 A	V_{GS} = 15 V, T_{vj} = 25 °C		22.4		mΩ
			V_{GS} = 18 V, T_{vj} = 25 °C		19.6	28.1	
			V_{GS} = 18 V, T_{vj} = 125 °C		29.2		
			V_{GS} = 18 V, T_{vj} = 175 °C		37.2		
栅极阈值电压	$V_{GS(th)}$	I_D = 8.2 mA, V_{DS} = V_{GS}, T_{vj} = 25 °C, (tested after 1ms pulse at V_{GS} = +20 V)		3.45	4.1	4.75	V
栅极电荷	Q_G	V_{DD}=400 V, V_{GS} = -3/18 V, T_{vj} = 25 °C			0.052		µC
内部栅极电阻	R_{Gint}	T_{vj}=25 °C			2		Ω
输入电容	C_{ISS}	f = 100 kHz, V_{DS}=500 V, V_{GS}=0 V	T_{vj}=25 °C		1.93		nF
输出电容	C_{OSS}	f = 100 kHz, V_{DS}=500 V, V_{GS}=0 V	T_{vj}=25 °C		0.135		nF
反向传输电容	C_{rss}	f = 100 kHz, V_{DS}=500 V, V_{GS}=0 V	T_{vj}=25 °C		7.52		pF
C_{OSS} 存储能量	E_{OSS}	V_{DS}=500 V, V_{GS} = -3/18 V, T_{vj} = 25 °C			20		µJ
漏源泄漏电流	I_{DSS}	V_{DS} = 750 V, V_{GS} = -3 V	T_{vj} = 25 °C			111	µA
栅极漏电流	I_{GSS}	V_{DS} = 0 V, T_{vj} = 25 °C	V_{GS}=20 V			400	nA
开通延迟时间(感性负载)	$t_{d\,on}$	I_D = 24 A, R_{Gon} = 18 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V, t_{dead} = 1000 ns, 0.1 V_{GS} to 0.1 I_D	T_{vj} = 25 °C		15.7		ns
			T_{vj} = 125 °C		15.7		
			T_{vj} = 175 °C		15.4		
上升时间(感性负载)	t_r	I_D = 24 A, R_{Gon} = 18 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V, t_{dead} = 1000 ns, 0.1 I_D to 0.9 I_D	T_{vj} = 25 °C		11.7		ns
			T_{vj} = 125 °C		11		
			T_{vj} = 175 °C		10.8		
关断延迟时间(感性负载)	$t_{d\,off}$	I_D = 24 A, R_{Goff} = 1 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V, 0.9 V_{GS} to 0.9 I_D	T_{vj} = 25 °C		21		ns
			T_{vj} = 125 °C		22		
			T_{vj} = 175 °C		23		

(待续)

表 5　　(续) 特征值

特征参数	代号	标注或测试条件		数值			单位
				最小值	典型值	最大值	
下降时间(感性负载)	t_f	I_D = 24 A, R_{Goff} = 1 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V, 0.9 I_D to 0.1 I_D	T_{vj} = 25 °C		5.3		ns
			T_{vj} = 125 °C		5.5		
			T_{vj} = 175 °C		5.8		
开通损耗能量 (每脉冲)	E_{on}	I_D = 24 A, V_{DD} = 400 V, L_σ = 15 nH, V_{GS} = -3/18 V, R_{Gon} = 18 Ω, di/dt = 2.35 kA/µs (T_{vj} = 175 °C), t_{dead} = 1000 ns	T_{vj} = 25 °C		198		µJ
			T_{vj} = 125 °C		215		
			T_{vj} = 175 °C		230		
开通损耗能量 (每脉冲), 优化条件下	$E_{on,o}$	I_D = 24 A, V_{DD} = 400 V, L_σ = 15 nH, V_{GS} = -3/18 V, $R_{Gon,o}$ = 16 Ω, di/dt = 2.65 kA/µs (T_{vj} = 175 °C), t_{dead} = 100 ns	T_{vj} = 25 °C		183		µJ
			T_{vj} = 125 °C		182		
			T_{vj} = 175 °C		189		
关断损耗能量 (每脉冲）	E_{off}	I_D = 24 A, V_{DD} = 400 V, L_σ = 15 nH, V_{GS} = -3/18 V, R_{Goff} = 1 Ω, dv/dt = 61 kV/µs (T_{vj} = 175 °C)	T_{vj} = 25 °C		11.7		µJ
			T_{vj} = 125 °C		11.9		
			T_{vj} = 175 °C		12.6		
结－散热器热阻	R_{thJH}	每个 MOSFET , λ_{grease} = 5 W/(m·K)			2.318		K/W
允许开关的温度范围	$T_{vj\,op}$			-40		175	°C
过载运行条件下的温度	$T_{vj\,over}$	过载工况， 累计最大 100 小时				200	°C

注: *The selection of positive and negative gate-source voltages impacts losses and the long-term behavior of the MOSFET and body diode. The design guidelines described in Application Notes AN 2018-09 and AN 2025-02 must be considered to ensure sound operation of the device over the planned lifetime.*

3　Body diode (MOSFET, T1-T4)

表 6　　最大标定值

特征参数	代号	标注或测试条件		数值	单位
体二极管正向直流电流	I_{SD}	T_{vj} = 175 °C, V_{GS} = -3 V	T_H = 65 °C	11	A
Pulsed body diode current	$I_{SD\,pulse}$			72	A

表 7　　特征值

特征参数	代号	标注或测试条件		数值			单位
				最小值	典型值	最大值	
正向电压	V_{SD}	I_{SD} = 24 A, V_{GS} = -3 V	T_{vj} = 25 °C		4.38	4.95	V
			T_{vj} = 125 °C		4.08		
			T_{vj} = 175 °C		3.96		
反向恢复峰值电流	I_{rrm}	I_{SD} = 24 A, di_s/dt = 2.35 kA/µs, V_{DD} = 400 V, V_{GS} = -3 V, t_{dead} = 1000 ns	T_{vj} = 25 °C		15.9		A
			T_{vj} = 125 °C		18.9		
			T_{vj} = 175 °C		21.5		
恢复电荷	Q_{rr}	I_{SD} = 24 A, di_s/dt = 2.35 kA/µs, V_{DD} = 400 V, V_{GS} = -3 V, t_{dead} = 1000 ns	T_{vj} = 25 °C		0.141		µC
			T_{vj} = 125 °C		0.187		
			T_{vj} = 175 °C		0.25		
反向恢复损耗（每脉冲）	E_{rec}	I_{SD} = 24 A, di_s/dt = 2.35 kA/µs (T_{vj} = 175 °C), V_{DD} = 400 V, V_{GS} = -3 V, t_{dead} = 1000 ns	T_{vj} = 25 °C		10.2		µJ
			T_{vj} = 125 °C		18.9		
			T_{vj} = 175 °C		29.5		
反向恢复损耗（每脉冲），优化条件下	$E_{rec,o}$	I_{SD} = 24 A, di_s/dt = 2.65 kA/µs (T_{vj} = 175 °C), V_{DD} = 400 V, V_{GS} = -3 V, t_{dead} = 100 ns	T_{vj} = 25 °C		11.5		µJ
			T_{vj} = 125 °C		14.4		
			T_{vj} = 175 °C		19.2		

4　MOSFET, T5-T8

表 8　　最大标定值

特征参数	代号	标注或测试条件		数值	单位
漏源极电压	V_{DSS}		T_{vj} = 25 °C	750	V
植入漏极电流	I_{DN}			13	A
连续漏极直流电流	I_{DDC}	T_{vj} = 175 °C, V_{GS} = 18 V	T_H = 125 °C	13	A
漏极重复峰值电流	I_{DRM}	verified by design, t_p limited by T_{vjmax}		39	A
栅-源瞬态最大电压	V_{GS}	D < 0.01		-10/25	V
栅-源稳态最大电压	V_{GS}			-7/20	V

表 9　　推荐值

特征参数	代号	标注或测试条件	[ZH]Values	单位
通态栅极电压	$V_{GS(on)}$		15...18	V
断态栅极电压	$V_{GS(off)}$		-5...0	V

表 10　　特征值

特征参数	代号	标注或测试条件		数值			单位
				最小值	典型值	最大值	
漏源通态电阻	$R_{DS(on)}$	I_D = 13 A	V_{GS} = 15 V, T_{vj} = 25 °C		41.4		mΩ
			V_{GS} = 18 V, T_{vj} = 25 °C		36.1	47.9	
			V_{GS} = 18 V, T_{vj} = 125 °C		54		
			V_{GS} = 18 V, T_{vj} = 175 °C		68.8		
栅极阈值电压	$V_{GS(th)}$	I_D = 4.44 mA, V_{DS} = V_{GS}, T_{vj} = 25 °C, (tested after 1ms pulse at V_{GS} = +20 V)		3.45	4.1	4.75	V
栅极电荷	Q_G	V_{DD}=400 V, V_{GS} = -3/18 V, T_{vj} = 25 °C			0.028		µC
内部栅极电阻	R_{Gint}	T_{vj}=25 °C			0		Ω
输入电容	C_{ISS}	f = 100 kHz, V_{DS}=500 V, V_{GS}=0 V	T_{vj}=25 °C		1.11		nF
输出电容	C_{OSS}	f = 100 kHz, V_{DS}=500 V, V_{GS}=0 V	T_{vj}=25 °C		0.082		nF
反向传输电容	C_{rss}	f = 100 kHz, V_{DS}=500 V, V_{GS}=0 V	T_{vj}=25 °C		3.98		pF
C_{OSS} 存储能量	E_{OSS}	V_{DS}=500 V, V_{GS} = -3/18 V, T_{vj} = 25 °C			12.3		µJ
漏源泄漏电流	I_{DSS}	V_{DS} = 750 V, V_{GS} = -3 V	T_{vj} = 25 °C			111	µA
栅极漏电流	I_{GSS}	V_{DS} = 0 V, T_{vj} = 25 °C	V_{GS}=20 V			400	nA
开通延迟时间(感性负载)	$t_{d\,on}$	I_D = 13 A, R_{Gon} = 13 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V, t_{dead} = 1000 ns, 0.1 V_{GS} to 0.1 I_D	T_{vj} = 25 °C		6.8		ns
			T_{vj} = 125 °C		6.1		
			T_{vj} = 175 °C		6.1		
上升时间(感性负载)	t_r	I_D = 13 A, R_{Gon} = 13 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V, t_{dead} = 1000 ns, 0.1 I_D to 0.9 I_D	T_{vj} = 25 °C		6.3		ns
			T_{vj} = 125 °C		6.2		
			T_{vj} = 175 °C		6		
关断延迟时间(感性负载)	$t_{d\,off}$	I_D = 13 A, R_{Goff} = 1.6 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V, 0.9 V_{GS} to 0.9 I_D	T_{vj} = 25 °C		14.1		ns
			T_{vj} = 125 °C		14.8		
			T_{vj} = 175 °C		15.2		

(待续)

表 10　　(续) 特征值

特征参数	代号	标注或测试条件		数值			单位
				最小值	典型值	最大值	
下降时间(感性负载)	t_f	I_D = 13 A, R_{Goff} = 1.6 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V, 0.9 I_D to 0.1 I_D	T_{vj} = 25 °C		4.9		ns
			T_{vj} = 125 °C		4.8		
			T_{vj} = 175 °C		4.8		
开通损耗能量 (每脉冲)	E_{on}	I_D = 13 A, V_{DD} = 400 V, L_σ = 15 nH, V_{GS} = -3/18 V, R_{Gon} = 13 Ω, di/dt = 2.6 kA/µs (T_{vj} = 175 °C), t_{dead} = 1000 ns	T_{vj} = 25 °C		89		µJ
			T_{vj} = 125 °C		98		
			T_{vj} = 175 °C		107		
开通损耗能量 (每脉冲), 优化条件下	$E_{on,o}$	I_D = 13 A, V_{DD} = 400 V, L_σ = 15 nH, V_{GS} = -3/18 V, $R_{Gon,o}$ = 8.2 Ω, di/dt = 3.75 kA/µs (T_{vj} = 175 °C), t_{dead} = 100 ns	T_{vj} = 25 °C		70		µJ
			T_{vj} = 125 °C		73		
			T_{vj} = 175 °C		73.3		
关断损耗能量 (每脉冲）	E_{off}	I_D = 13 A, V_{DD} = 400 V, L_σ = 15 nH, V_{GS} = -3/18 V, R_{Goff} = 1.6 Ω, dv/dt = 37.5 kV/µs (T_{vj} = 175 °C)	T_{vj} = 25 °C		1.66		µJ
			T_{vj} = 125 °C		1.71		
			T_{vj} = 175 °C		1.78		
结－散热器热阻	R_{thJH}	每个 MOSFET , λ_{grease} = 5 W/(m·K)			2.701		K/W
允许开关的温度范围	$T_{vj\,op}$			-40		175	°C
过载运行条件下的温度	$T_{vj\,over}$	过载工况，累计最大 100 小时				200	°C

注: *The selection of positive and negative gate-source voltages impacts losses and the long-term behavior of the MOSFET and body diode. The design guidelines described in Application Notes AN 2018-09 and AN 2025-02 must be considered to ensure sound operation of the device over the planned lifetime.*

5　Body diode (MOSFET, T5-T8)

表 11　　最大标定值

特征参数	代号	标注或测试条件		数值	单位
体二极管正向直流电流	I_{SD}	T_{vj} = 175 °C, V_{GS} = -3 V	T_H = 65 °C	11	A
Pulsed body diode current	$I_{SD\,pulse}$			39	A

表 12　　特征值

特征参数	代号	标注或测试条件		数值			单位
				最小值	典型值	最大值	
正向电压	V_{SD}	I_{SD} = 13 A, V_{GS} = -3 V	T_{vj} = 25 °C		4.38	4.95	V
			T_{vj} = 125 °C		4.08		
			T_{vj} = 175 °C		3.96		
反向恢复峰值电流	I_{rrm}	I_{SD} = 13 A, di_s/dt = 2.6 kA/µs, V_{DD} = 400 V, V_{GS} = -3 V, t_{dead} = 1000 ns	T_{vj} = 25 °C		18.6		A
			T_{vj} = 125 °C		21		
			T_{vj} = 175 °C		23.5		
恢复电荷	Q_{rr}	I_{SD} = 13 A, di_s/dt = 2.6 kA/µs, V_{DD} = 400 V, V_{GS} = -3 V, t_{dead} = 1000 ns	T_{vj} = 25 °C		0.127		µC
			T_{vj} = 125 °C		0.161		
			T_{vj} = 175 °C		0.198		
反向恢复损耗（每脉冲）	E_{rec}	I_{SD} = 13 A, di_s/dt = 2.6 kA/µs (T_{vj} = 175 °C), V_{DD} = 400 V, V_{GS} = -3 V, t_{dead} = 1000 ns	T_{vj} = 25 °C		12.1		µJ
			T_{vj} = 125 °C		18.7		
			T_{vj} = 175 °C		25.2		
反向恢复损耗（每脉冲），优化条件下	$E_{rec,o}$	I_{SD} = 13 A, di_s/dt = 3.75 kA/µs (T_{vj} = 175 °C), V_{DD} = 400 V, V_{GS} = -3 V, t_{dead} = 100 ns	T_{vj} = 25 °C		21.5		µJ
			T_{vj} = 125 °C		26.5		
			T_{vj} = 175 °C		39		

6　负温度系数热敏电阻

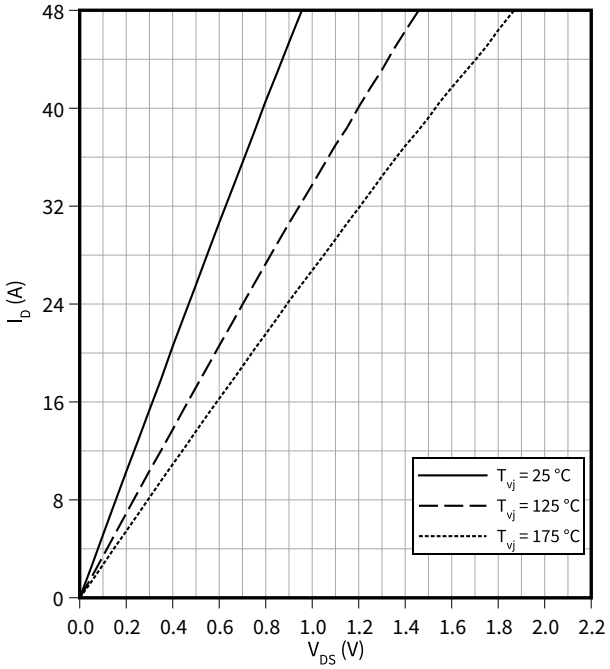
表 13　　特征值

特征参数	代号	标注或测试条件	数值			单位
			最小值	典型值	最大值	
额定电阻值	R_{25}	T_{NTC} = 25 °C		5		kΩ
R_{100} 偏差	$\Delta R/R$	T_{NTC} = 100 °C, R_{100} = 493 Ω	-5		5	%
耗散功率	P_{25}	T_{NTC} = 25 °C			20	mW
B-值	$B_{25/50}$	$R_2 = R_{25} \exp[B_{25/50}(1/T_2-1/(298{,}15\ K))]$		3375		K
B-值	$B_{25/80}$	$R_2 = R_{25} \exp[B_{25/80}(1/T_2-1/(298{,}15\ K))]$		3411		K
B-值	$B_{25/100}$	$R_2 = R_{25} \exp[B_{25/100}(1/T_2-1/(298{,}15\ K))]$		3433		K

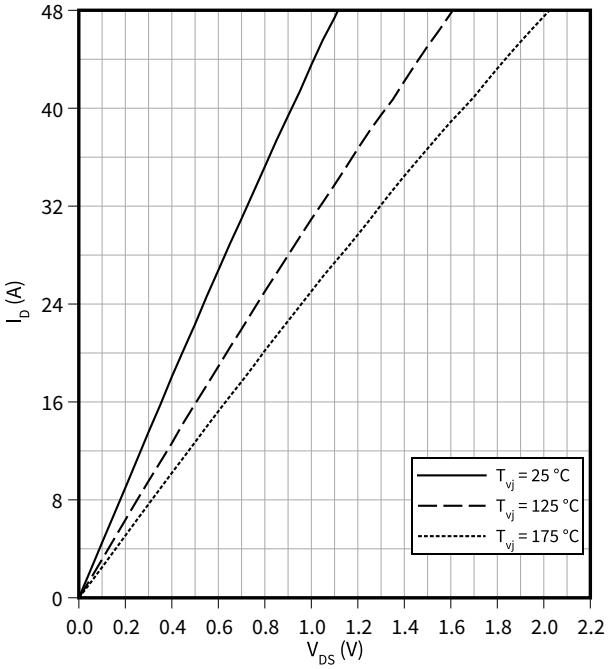
注:　NTC 的具体参数分析请见 AN2009-10, 第 4 章

7 特征参数图表

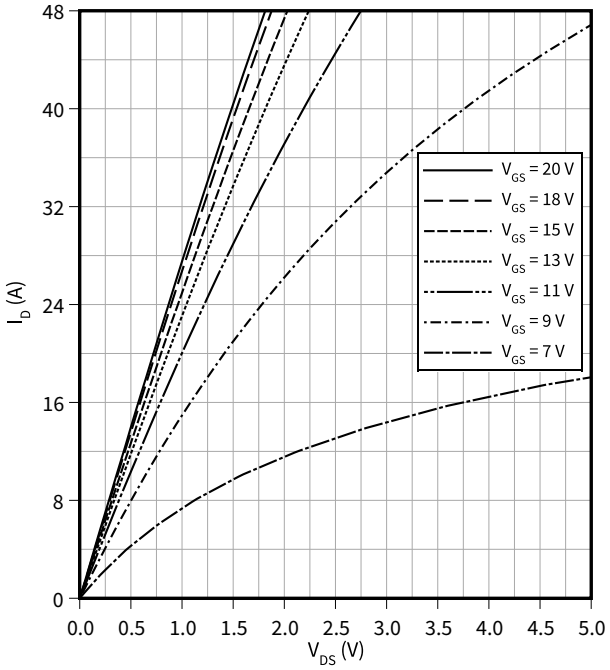
输出特性 （典型), MOSFET, T1-T4
$I_D = f(V_{DS})$
V_{GS} = 18 V



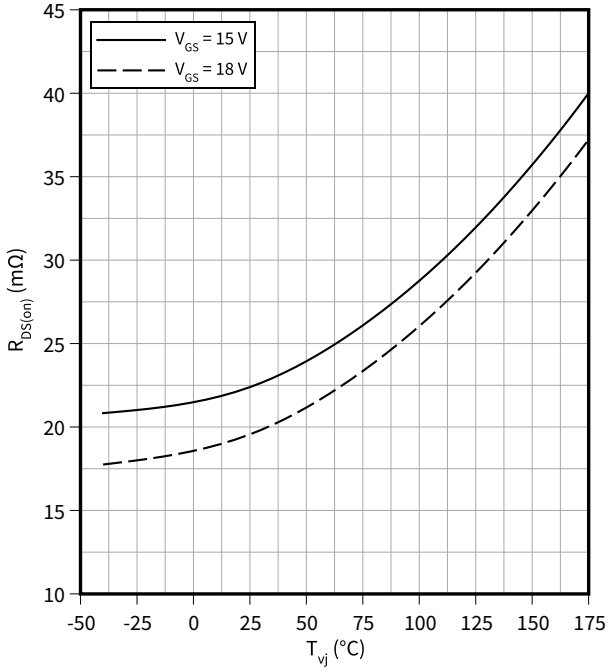
输出特性 （典型), MOSFET, T1-T4
$I_D = f(V_{DS})$
V_{GS} = 15 V



输出特性 （典型), MOSFET, T1-T4
$I_D = f(V_{DS})$
T_{vj} = 175 °C

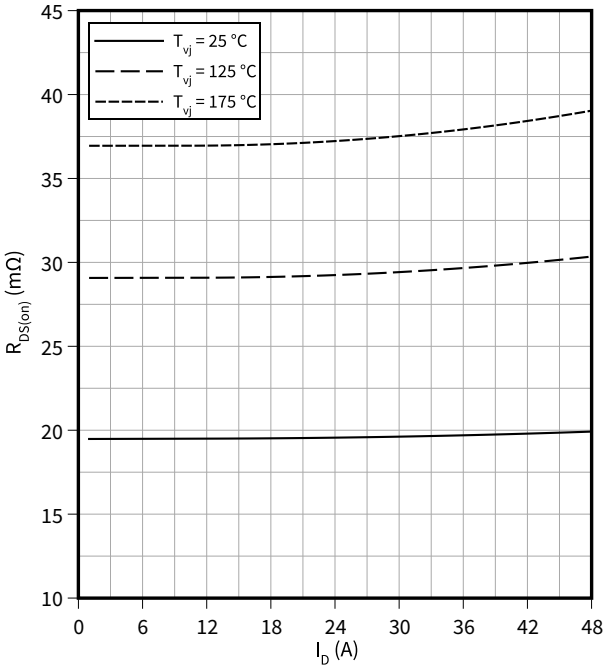


漏源通态电阻 （典型), MOSFET, T1-T4
$R_{DS(on)} = f(T_{vj})$
I_D = 24 A



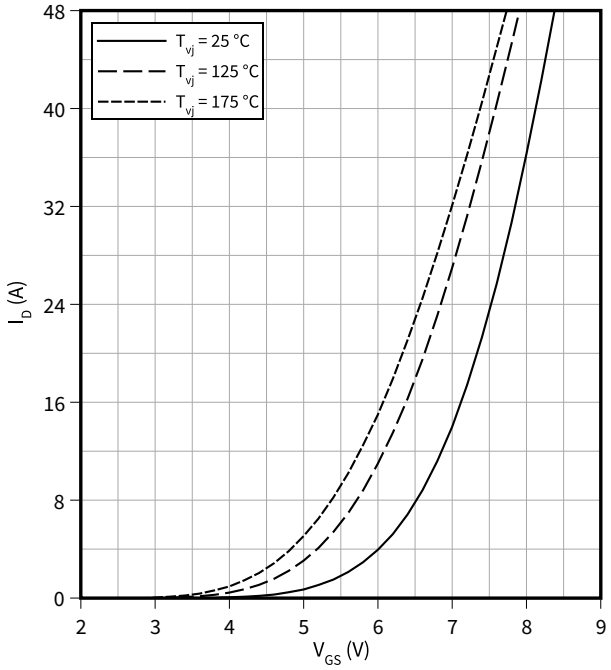
漏源通态电阻 （典型), MOSFET, T1-T4

$R_{DS(on)} = f(I_D)$
$V_{GS} = 18\ V$



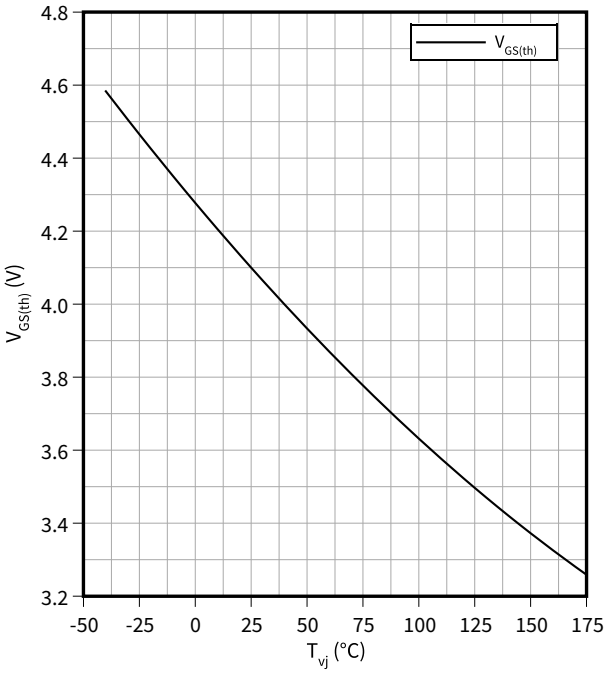
传输特性 （典型), MOSFET, T1-T4

$I_D = f(V_{GS})$
$V_{DS} = 20\ V$



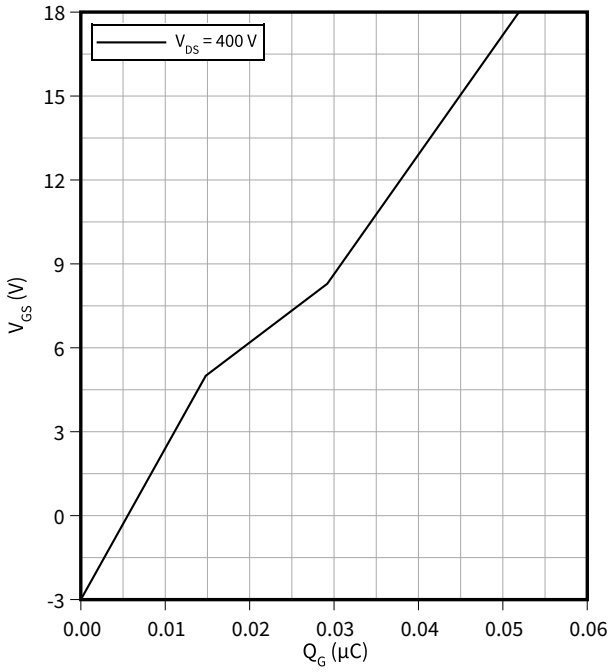
栅-源阈值电压（典型）, MOSFET, T1-T4

$V_{GS(th)} = f(T_{vj})$
$I_D = 8.2\ mA, V_{GS} = V_{DS}$



栅极电荷特性 （典型), MOSFET, T1-T4

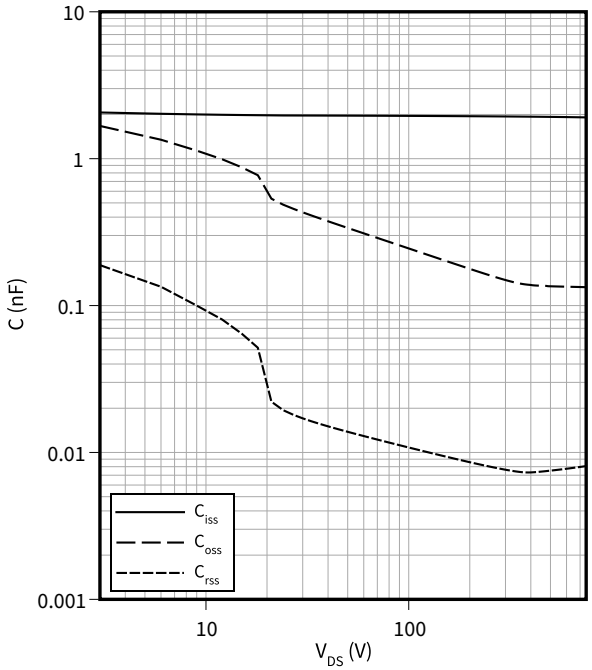
$V_{GS} = f(Q_G)$
$I_D = 24\ A, T_{vj} = 25\ °C$



电容特性 （典型), MOSFET, T1-T4

C = f(V_{DS})

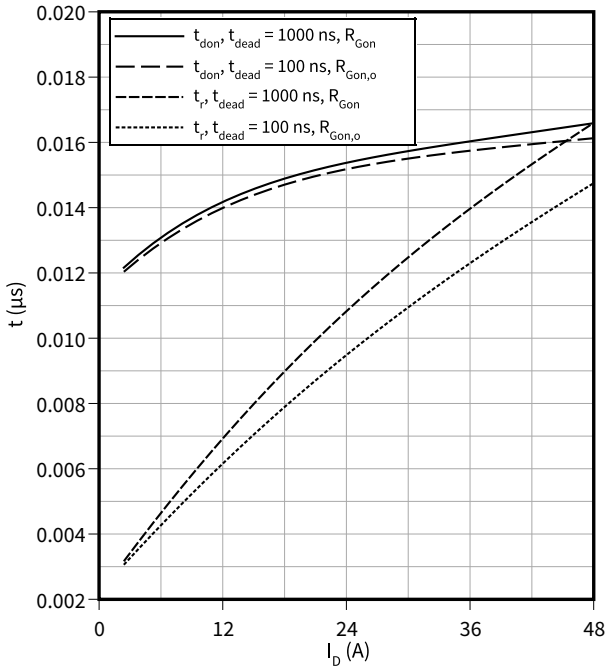
f = 100 kHz, T_{vj} = 25 °C, V_{GS} = 0 V



开关时间 （典型), MOSFET, T1-T4

t = f(I_D)

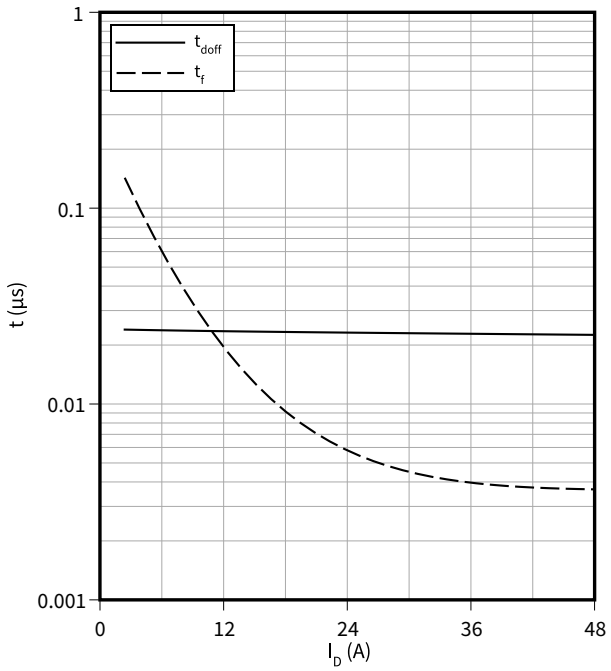
V_{DD} = 400 V, R_{Gon} = 18 Ω, $R_{Gon,o}$ = 16 Ω, T_{vj} = 175 °C, V_{GS} = -3/18 V



开关时间 （典型), MOSFET, T1-T4

t = f(I_D)

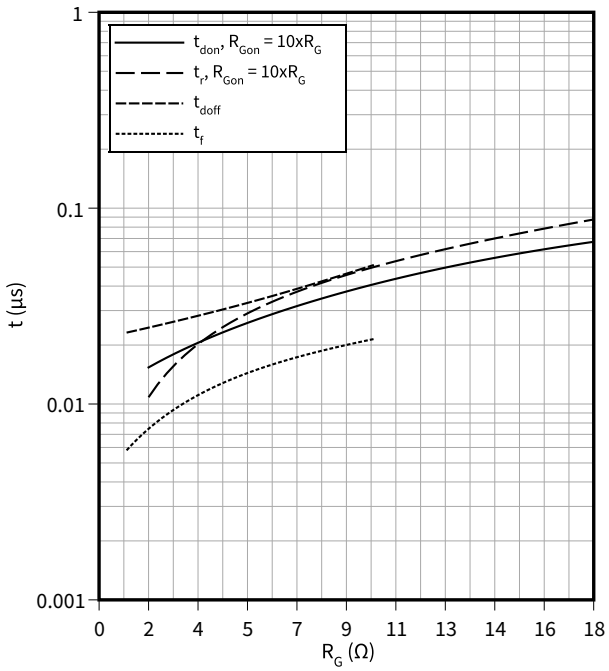
R_{Goff} = 1 Ω, V_{DD} = 400 V, T_{vj} = 175 °C, V_{GS} = -3/18 V



开关时间 （典型), MOSFET, T1-T4

t = f(R_G)

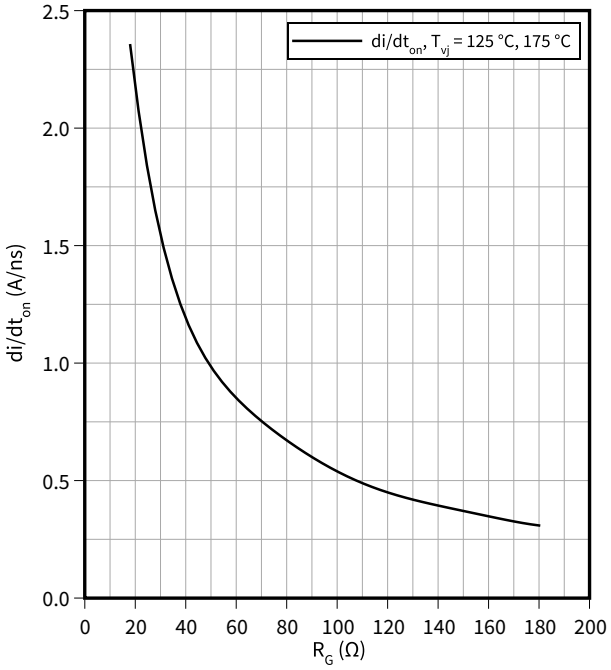
V_{DD} = 400 V, t_{dead} = 1000 ns, I_D = 24 A, T_{vj} = 175 °C, V_{GS} = -3/18 V



电流变化斜率 （典型), MOSFET, T1-T4

$di/dt_{on} = f(R_G)$

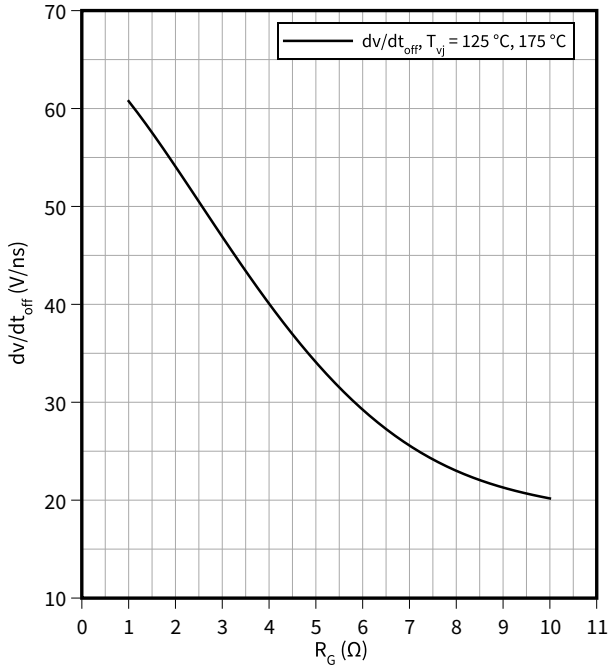
V_{DD} = 400 V, t_{dead} = 1000 ns, I_D = 24 A, V_{GS} = -3/18 V



电压变化斜率 （典型), MOSFET, T1-T4

$dv/dt_{off} = f(R_G)$

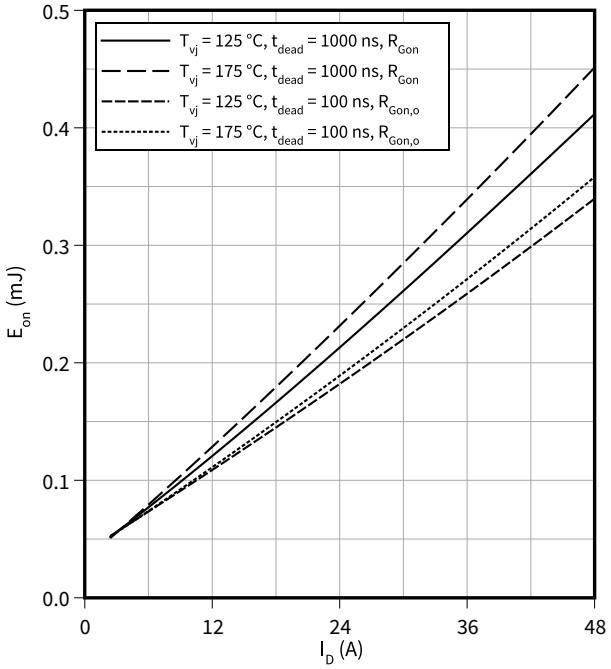
V_{DD} = 400 V, I_D = 24 A, V_{GS} = -3/18 V



开关损耗 （典型), MOSFET, T1-T4

$E_{on} = f(I_D)$

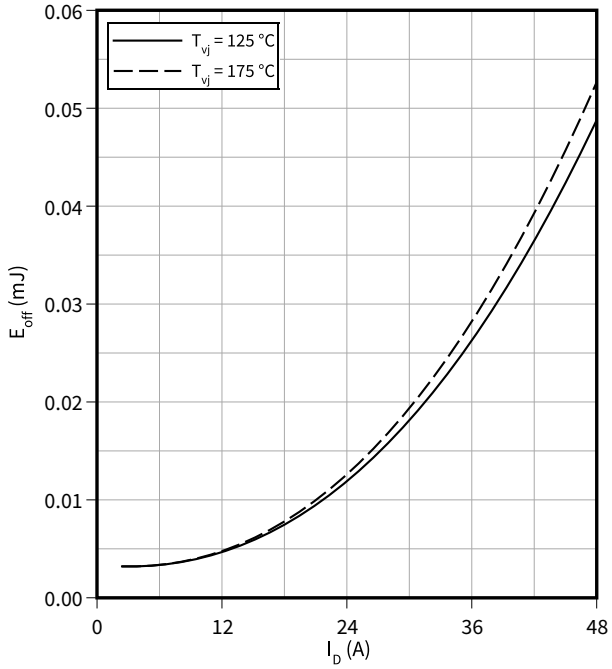
V_{DD} = 400 V, R_{Gon} = 18 Ω, $R_{Gon,o}$ = 16 Ω, V_{GS} = -3/18 V



开关损耗 （典型), MOSFET, T1-T4

$E_{off} = f(I_D)$

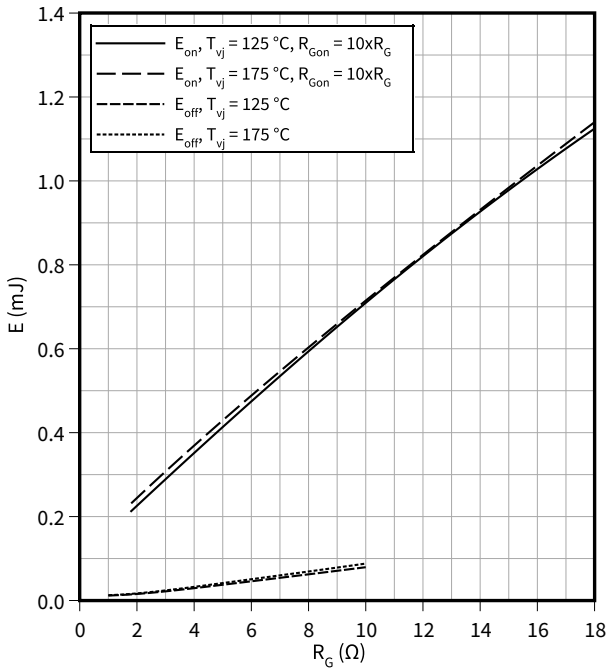
R_{Goff} = 1 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V



开关损耗 （典型), MOSFET, T1-T4

$E = f(R_G)$

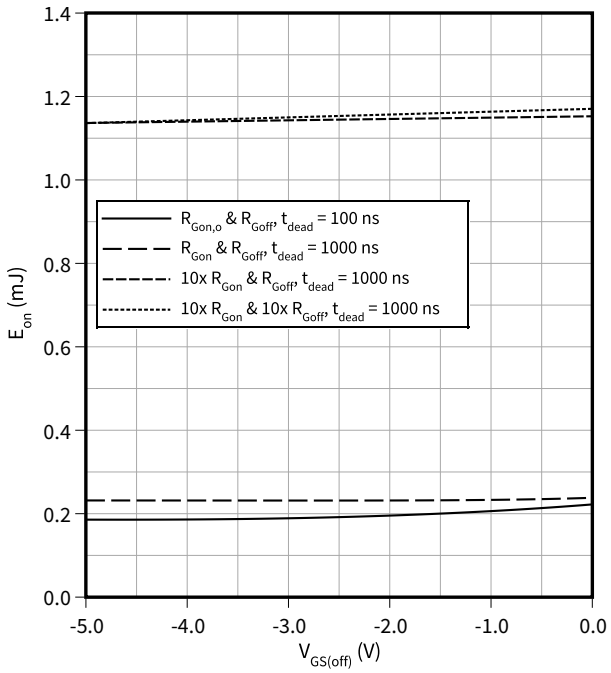
V_{DD} = 400 V, t_{dead} = 1000 ns, I_D = 24 A, V_{GS} = -3/18 V



开关损耗 （典型), MOSFET, T1-T4

$E_{on} = f(V_{GS(off)})$

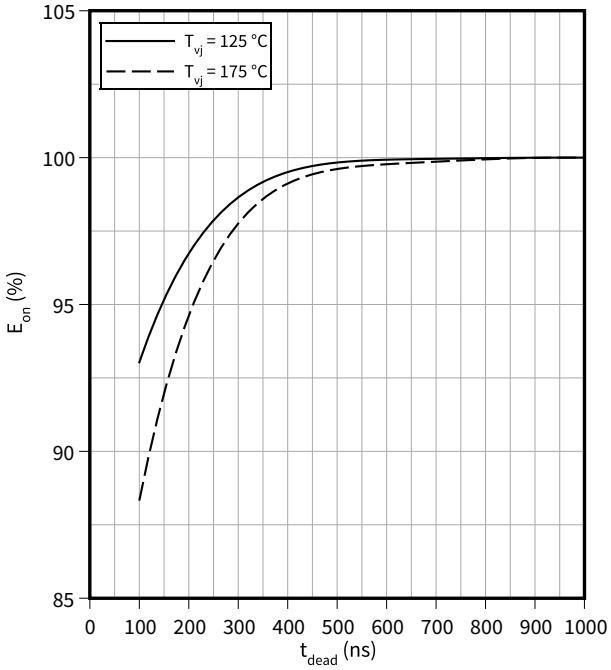
R_{Goff} = 1 Ω, V_{DD} = 400 V, R_{Gon} = 18 Ω, $V_{GS(on)}$ = -3/18 V, I_D = 24 A, $R_{Gon,o}$ = 16 Ω, T_{vj} = 175 °C



开关损耗 （典型), MOSFET, T1-T4

$E_{on} = f(t_{dead})$

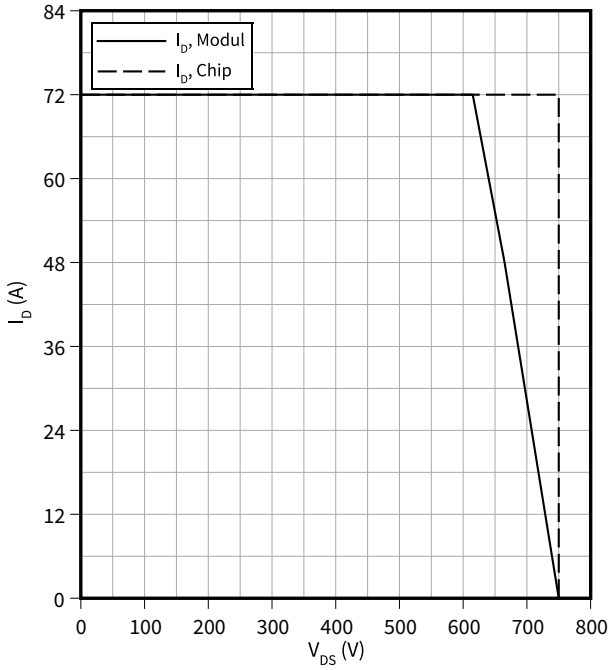
R_{Gon} = 18 Ω, I_D = 24 A, V_{DD} = 400 V, V_{GS} = -3/18 V



反偏安全工作区 （RBSOA）, MOSFET, T1-T4

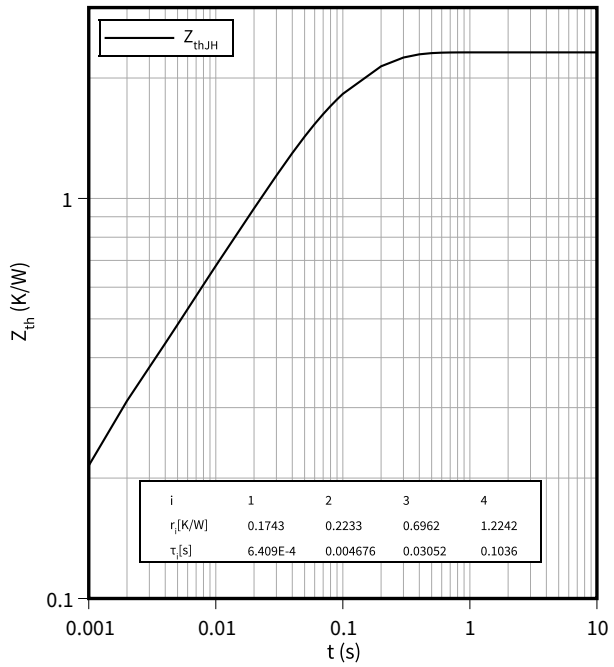
$I_D = f(V_{DS})$

R_{Goff} = 1 Ω, T_{vj} = 175 °C, V_{GS} = -3/18 V



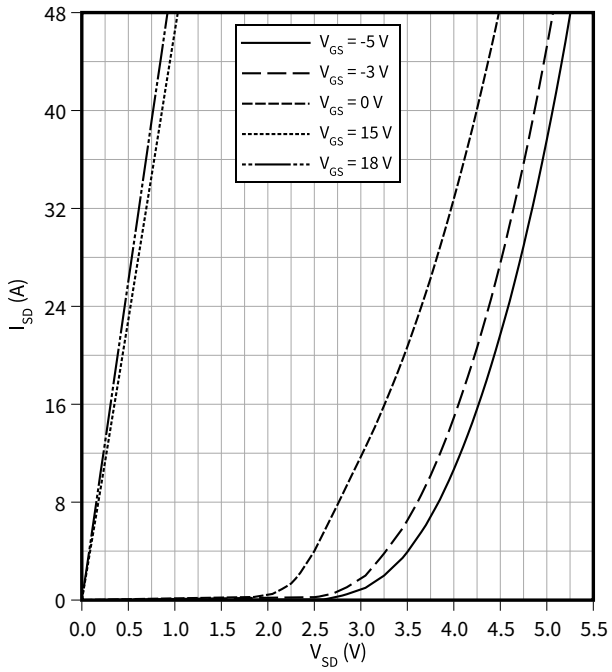
瞬态热阻抗, MOSFET, T1-T4

$Z_{th} = f(t)$



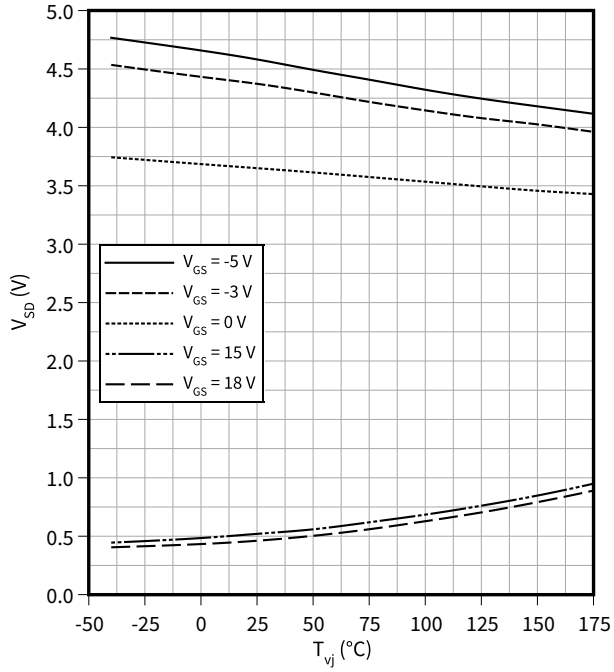
正向特性 体二极管（典型), MOSFET, T1-T4

$I_{SD} = f(V_{SD})$
$T_{vj} = 25\ °C$



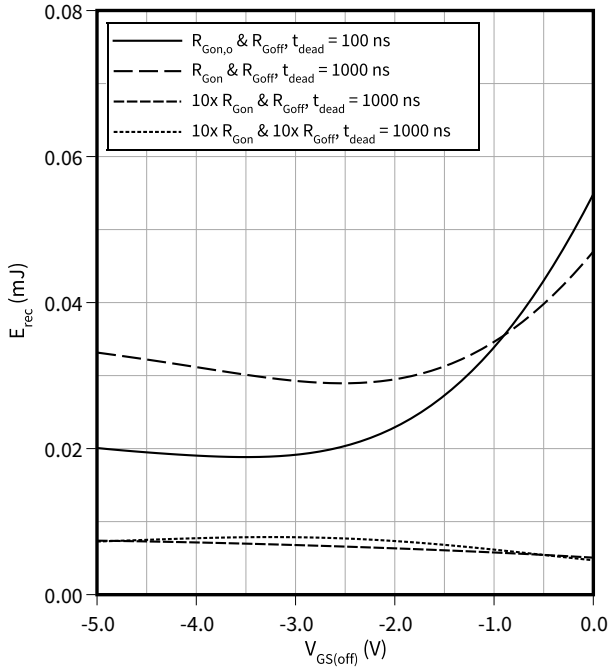
体二极管正向压降（典型), MOSFET, T1-T4

$V_{SD} = f(T_{vj})$
$I_{SD} = 24\ A$



开关损耗 体二极管（典型), MOSFET, T1-T4

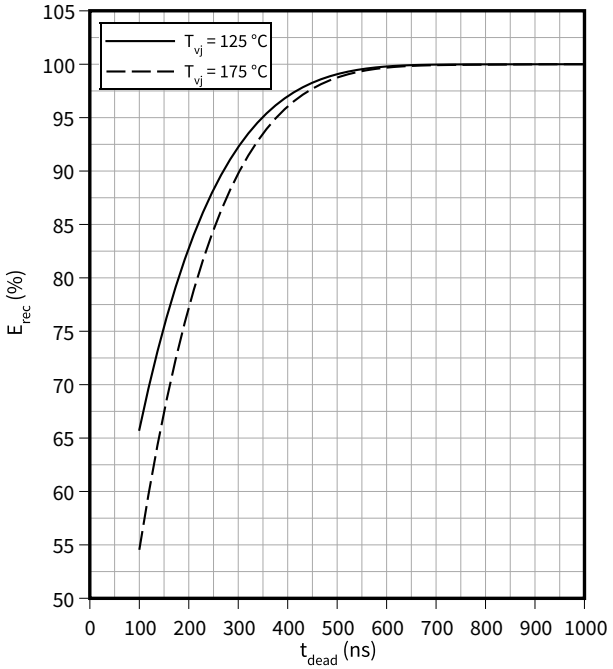
$E_{rec} = f(V_{GS(off)})$
$R_{Goff} = 1\ \Omega$, $R_{Gon} = 18\ \Omega$, $V_{GS(on)} = 18\ V$, $I_{SD} = 24\ A$,
$R_{Gon,o} = 16\ \Omega$, $V_{DD} = 400\ V$, $T_{vj} = 175\ °C$



开关损耗 体二极管（典型), MOSFET, T1-T4

$E_{rec} = f(t_{dead})$

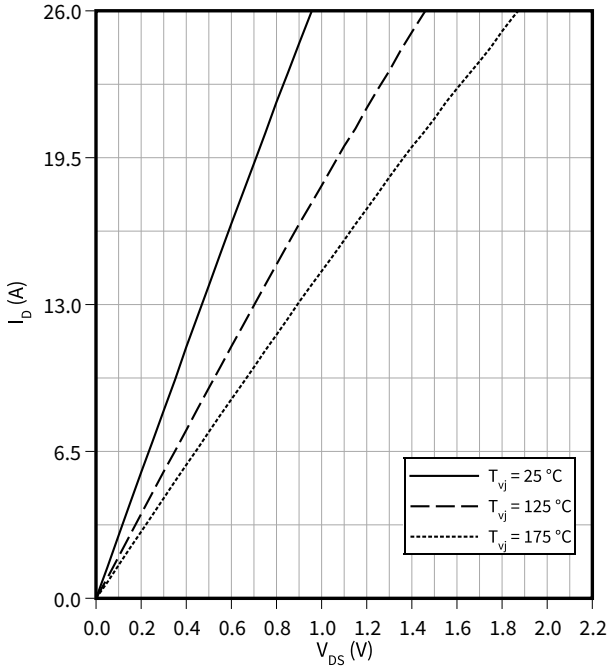
$R_{Gon} = 18\ \Omega$, $I_D = 24$ A, $V_{DD} = 400$ V, $V_{GS} = -3/18$ V



输出特性 （典型), MOSFET, T5-T8

$I_D = f(V_{DS})$

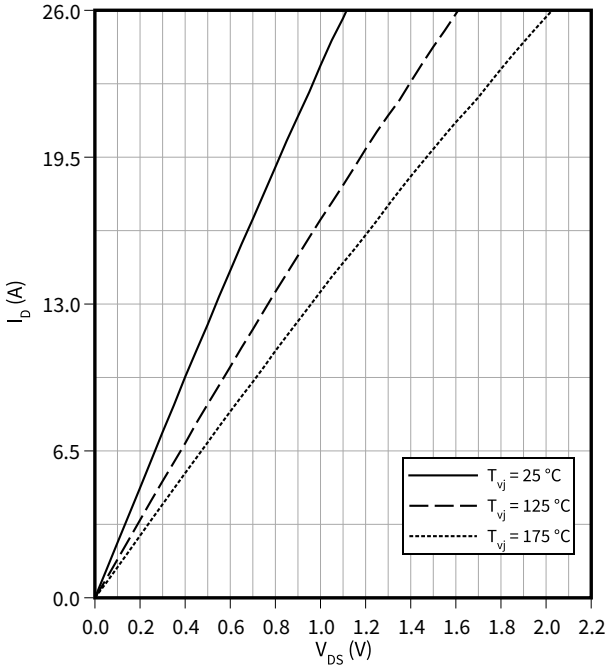
$V_{GS} = 18$ V



输出特性 （典型), MOSFET, T5-T8

$I_D = f(V_{DS})$

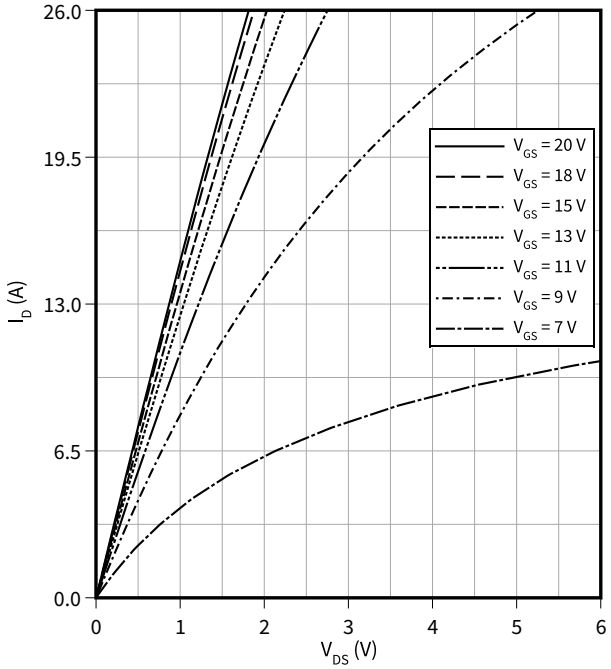
$V_{GS} = 15$ V



输出特性 （典型), MOSFET, T5-T8

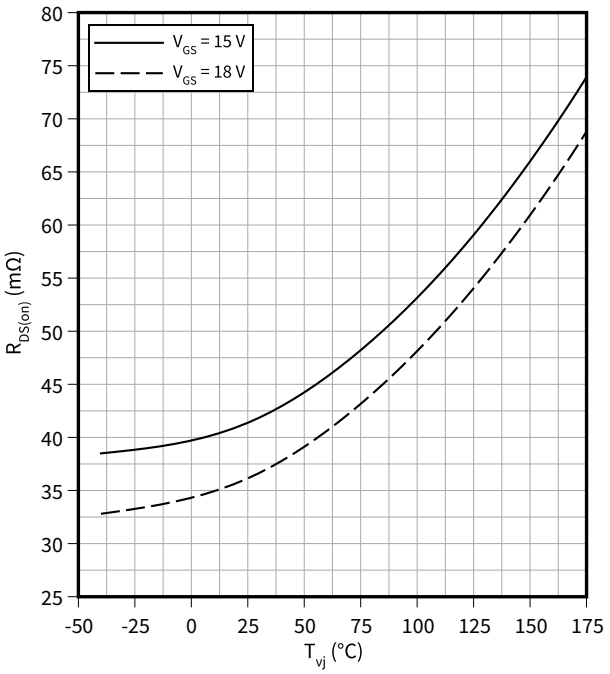
$I_D = f(V_{DS})$

$T_{vj} = 175$ °C



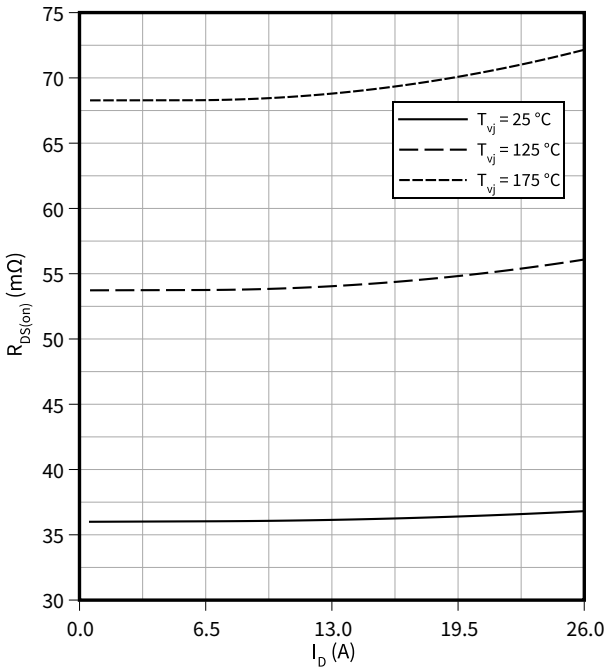
漏源通态电阻 （典型), MOSFET, T5-T8

$R_{DS(on)} = f(T_{vj})$
$I_D = 13$ A



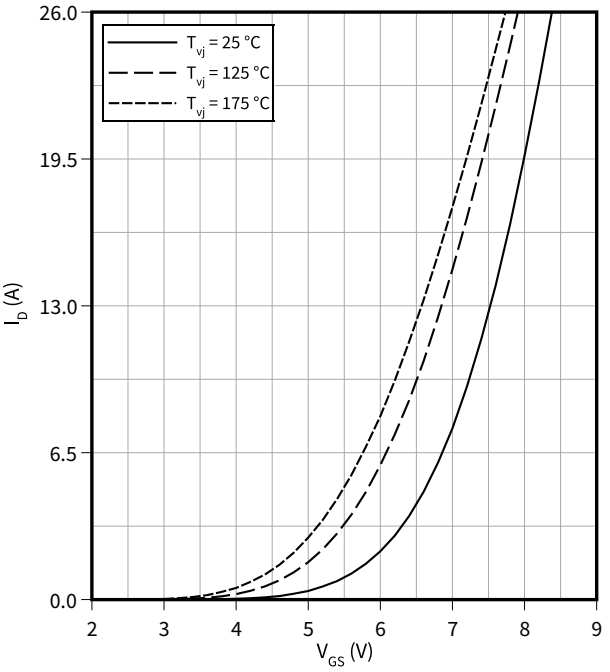
漏源通态电阻 （典型), MOSFET, T5-T8

$R_{DS(on)} = f(I_D)$
$V_{GS} = 18$ V



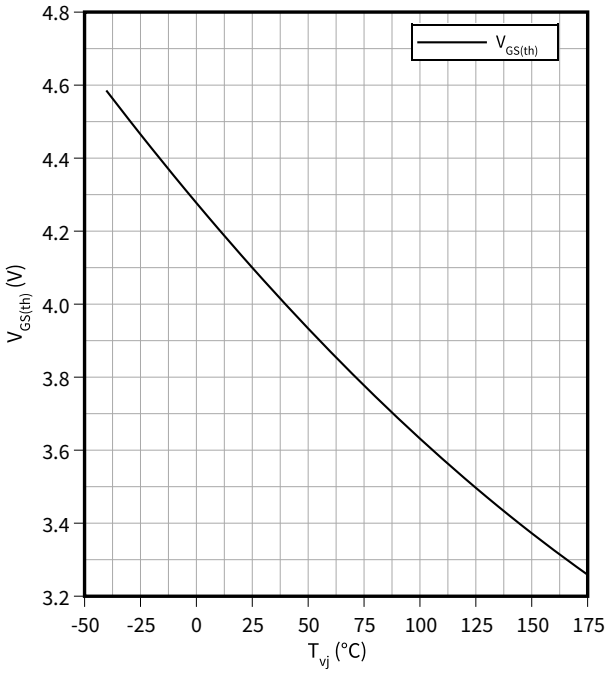
传输特性 （典型), MOSFET, T5-T8

$I_D = f(V_{GS})$
$V_{DS} = 20$ V



栅-源阈值电压（典型）, MOSFET, T5-T8

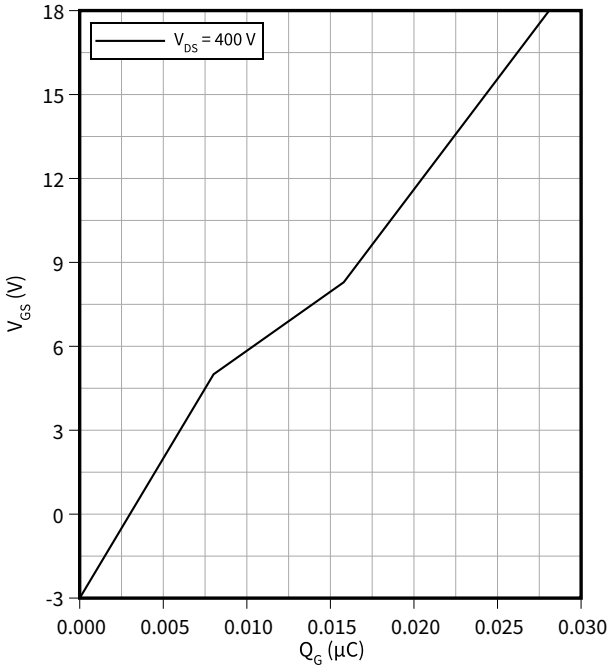
$V_{GS(th)} = f(T_{vj})$
$I_D = 4.44$ mA, $V_{GS} = V_{DS}$



栅极电荷特性 （典型), MOSFET, T5-T8

$V_{GS} = f(Q_G)$

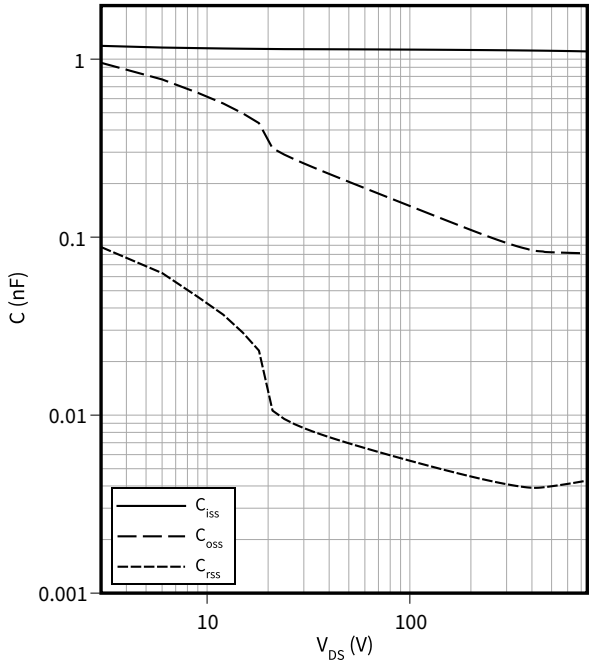
I_D = 13 A, T_{vj} = 25 °C



电容特性 （典型), MOSFET, T5-T8

$C = f(V_{DS})$

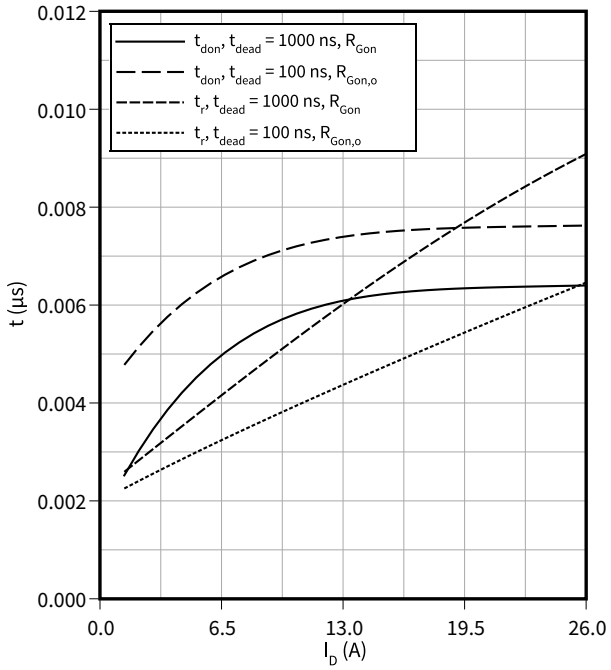
f = 100 kHz, T_{vj} = 25 °C, V_{GS} = 0 V



开关时间 （典型), MOSFET, T5-T8

$t = f(I_D)$

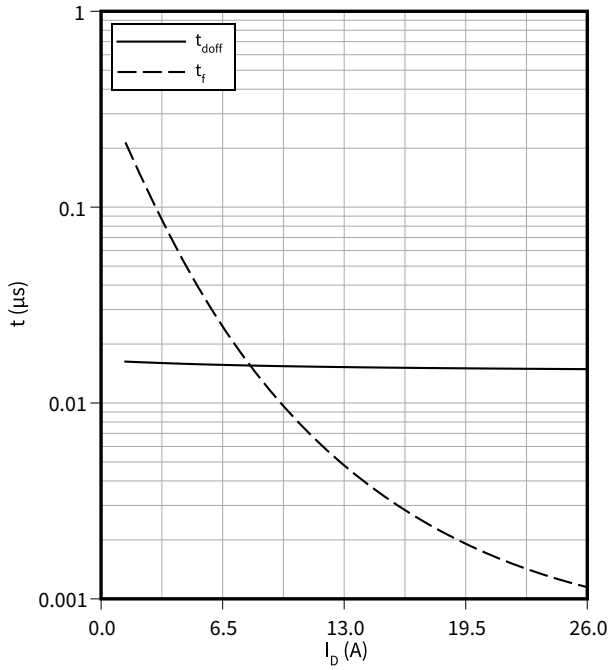
V_{DD} = 400 V, R_{Gon} = 13 Ω, $R_{Gon,o}$ = 8.2 Ω, T_{vj} = 175 °C, V_{GS} = -3/18 V



开关时间 （典型), MOSFET, T5-T8

$t = f(I_D)$

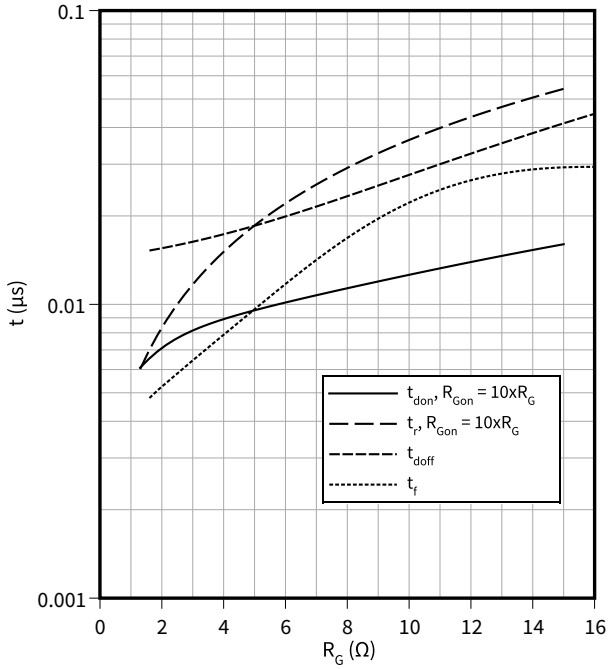
R_{Goff} = 1.6 Ω, V_{DD} = 400 V, T_{vj} = 175 °C, V_{GS} = -3/18 V



开关时间 （典型), MOSFET, T5-T8

$t = f(R_G)$

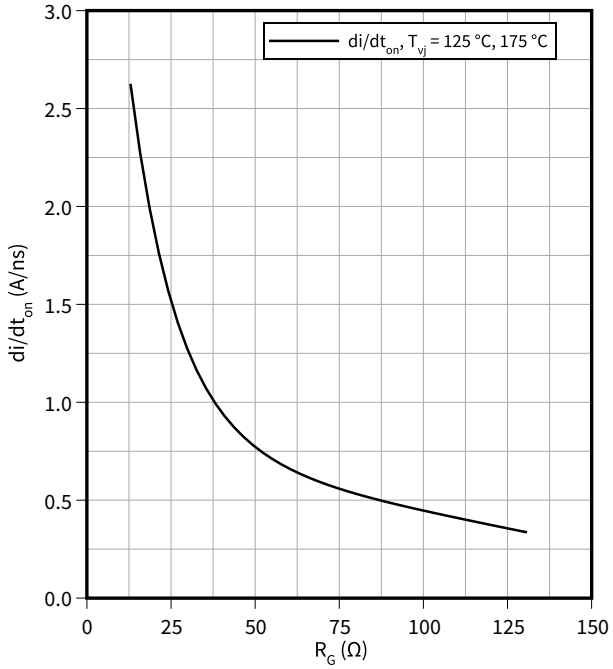
V_{DD} = 400 V, t_{dead} = 1000 ns, I_D = 13 A, T_{vj} = 175 °C, V_{GS} = -3/18 V



电流变化斜率 （典型), MOSFET, T5-T8

$di/dt_{on} = f(R_G)$

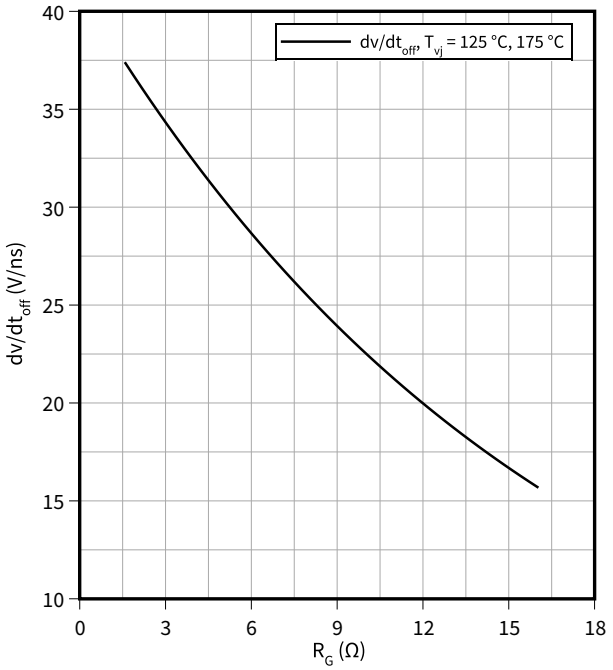
V_{DD} = 400 V, t_{dead} = 1000 ns, I_D = 13 A, V_{GS} = -3/18 V



电压变化斜率 （典型), MOSFET, T5-T8

$dv/dt_{off} = f(R_G)$

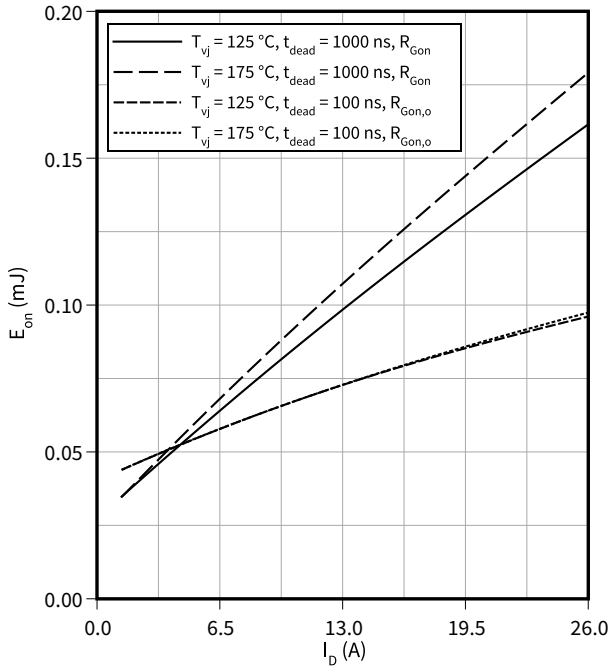
V_{DD} = 400 V, I_D = 13 A, V_{GS} = -3/18 V



开关损耗 （典型), MOSFET, T5-T8

$E_{on} = f(I_D)$

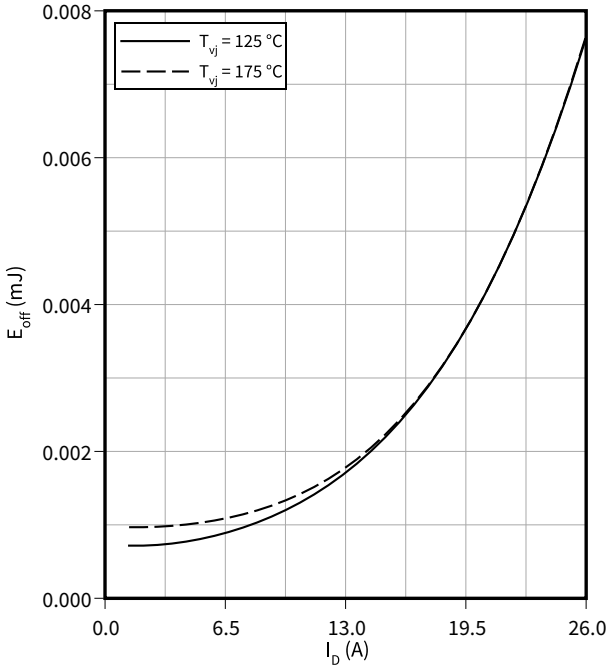
V_{DD} = 400 V, R_{Gon} = 13 Ω, $R_{Gon,o}$ = 8.2 Ω, V_{GS} = -3/18 V



开关损耗 （典型), MOSFET, T5-T8

$E_{off} = f(I_D)$

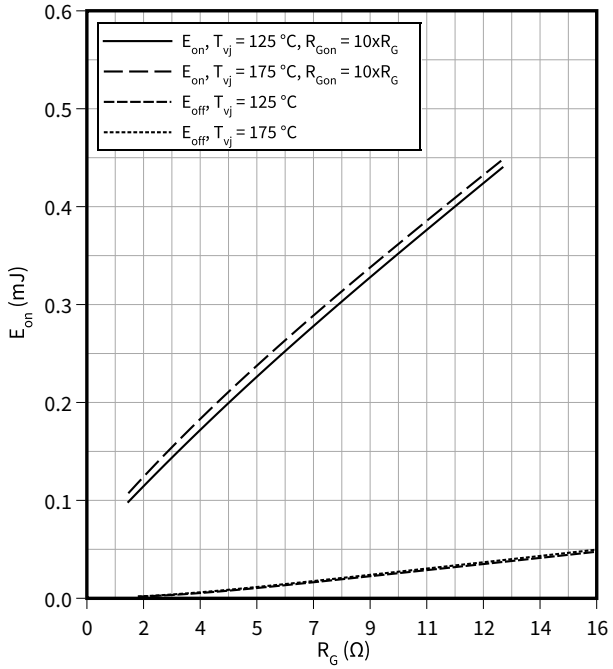
R_{Goff} = 1.6 Ω, V_{DD} = 400 V, V_{GS} = -3/18 V



开关损耗 （典型), MOSFET, T5-T8

$E_{on} = f(R_G)$

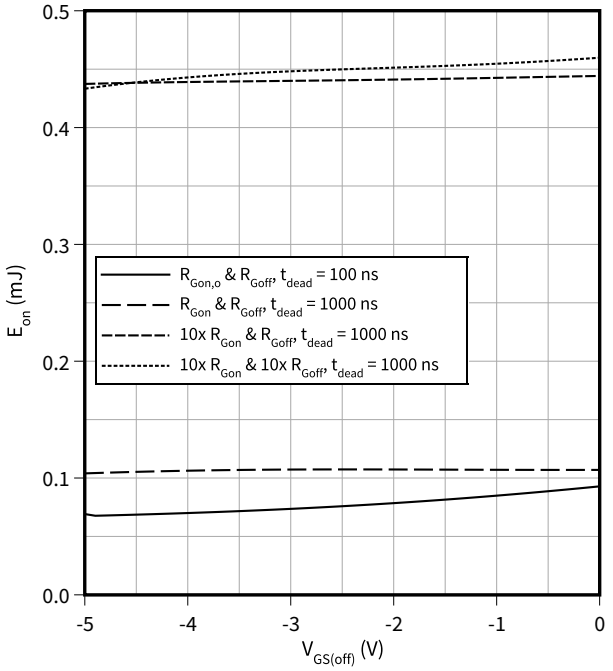
V_{DD} = 400 V, t_{dead} = 1000 ns, I_D = 13 A, V_{GS} = -3/18 V



开关损耗 （典型), MOSFET, T5-T8

$E_{on} = f(V_{GS(off)})$

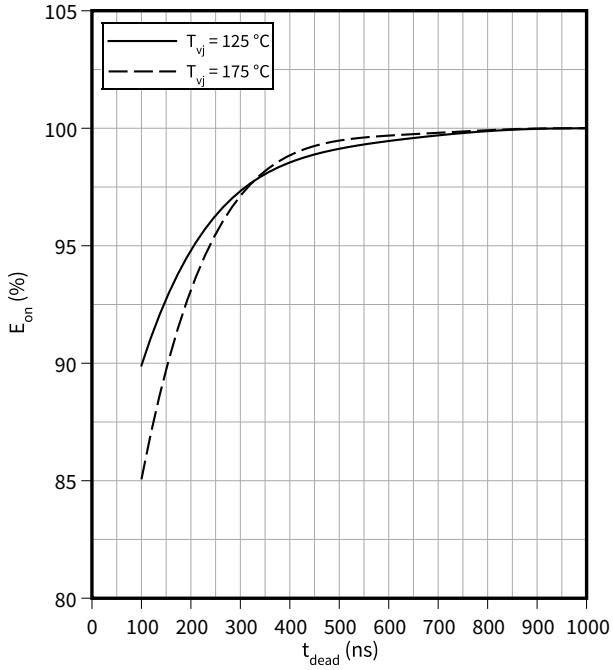
R_{Goff} = 1.6 Ω, V_{DD} = 400 V, R_{Gon} = 13 Ω, $V_{GS(on)}$ = 18 V, I_D = 13 A, $R_{Gon,o}$ = 8.2 Ω, T_{vj} = 175 °C



开关损耗 （典型), MOSFET, T5-T8

$E_{on} = f(t_{dead})$

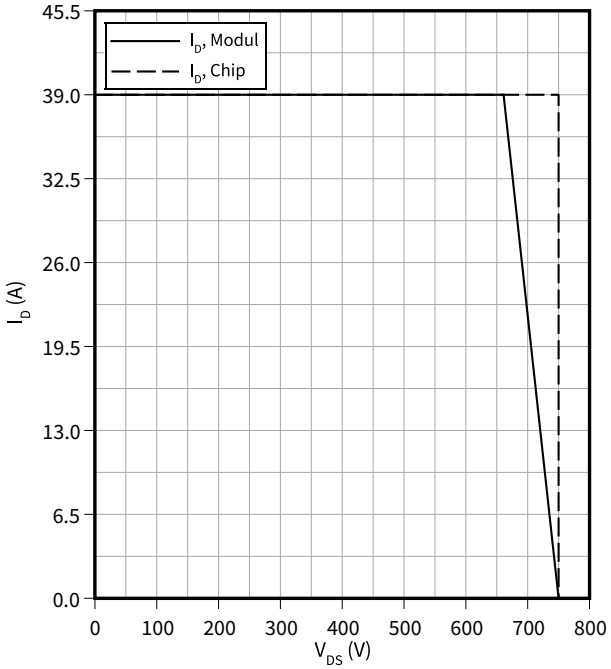
R_{Gon} = 13 Ω, I_D = 13 A, V_{DD} = 400 V, V_{GS} = -3/18 V



反偏安全工作区 （RBSOA）, MOSFET, T5-T8

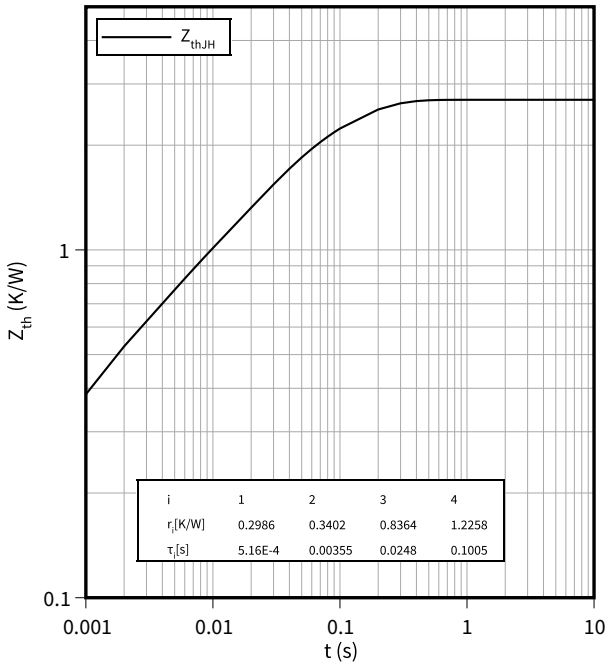
$I_D = f(V_{DS})$

$R_{Goff} = 1.6\ \Omega$, $T_{vj} = 175\ °C$, $V_{GS} = -3/18\ V$



瞬态热阻抗, MOSFET, T5-T8

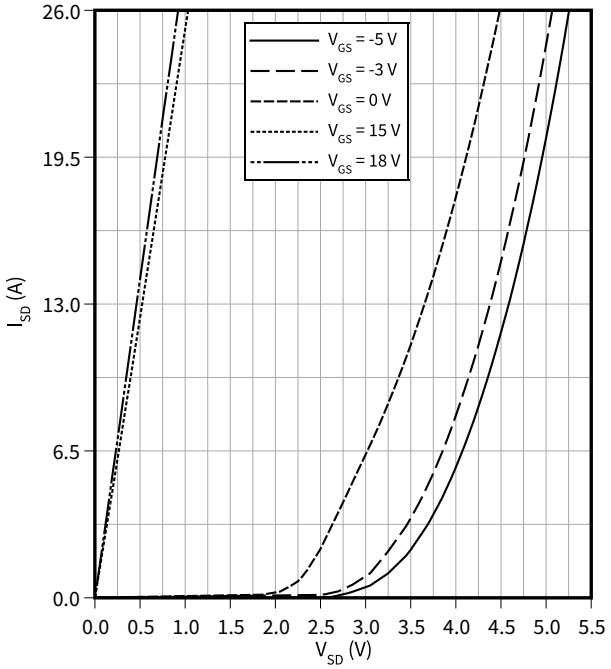
$Z_{th} = f(t)$



正向特性 体二极管（典型), MOSFET, T5-T8

$I_{SD} = f(V_{SD})$

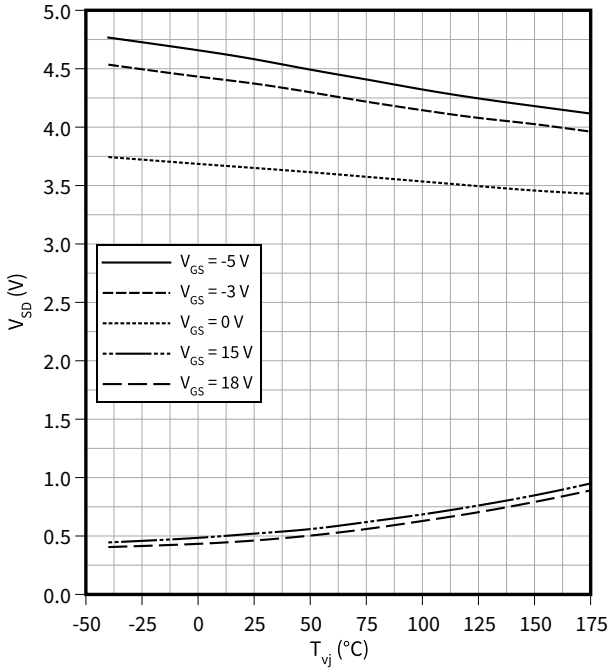
$T_{vj} = 25\ °C$



体二极管正向压降（典型), MOSFET, T5-T8

$V_{SD} = f(T_{vj})$

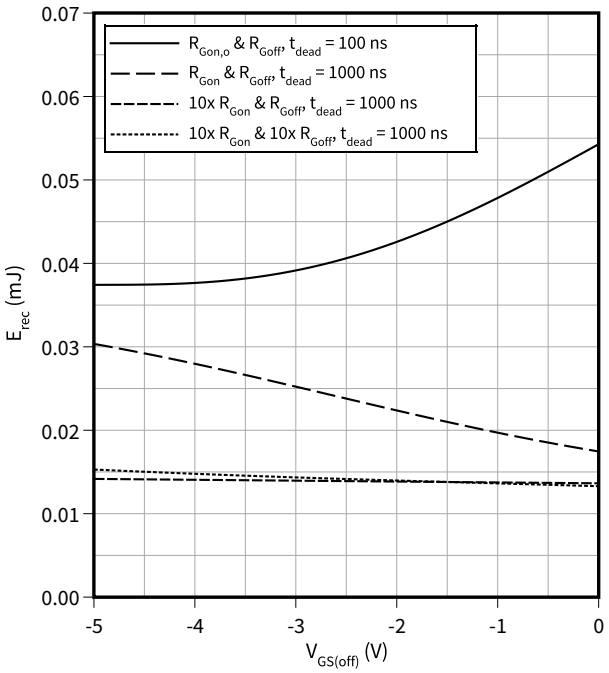
$I_{SD} = 13\ A$



开关损耗 体二极管（典型), MOSFET, T5-T8

$E_{rec} = f(V_{GS(off)})$

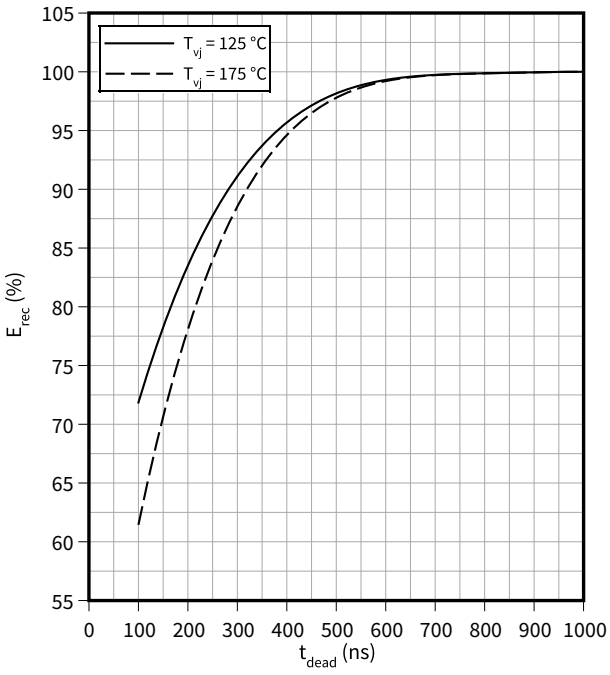
R_{Goff} = 1.6 Ω, R_{Gon} = 13 Ω, $V_{GS(on)}$ = 18 V, I_{SD} = 13 A,
$R_{Gon,o}$ = 8.2 Ω, V_{DD} = 400 V, T_{vj} = 175 °C



开关损耗 体二极管（典型), MOSFET, T5-T8

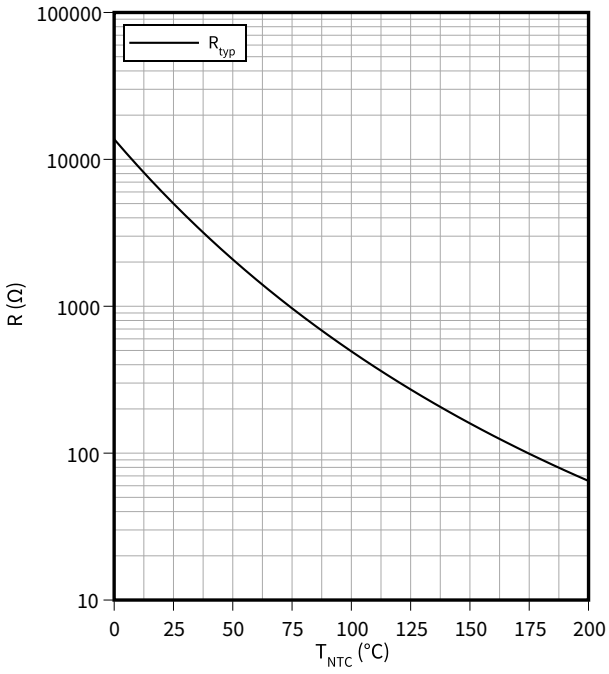
$E_{rec} = f(t_{dead})$

R_{Gon} = 13 Ω, I_D = 13 A, V_{DD} = 400 V, V_{GS} = -3/18 V



温度特性, 负温度系数热敏电阻

$R = f(T_{NTC})$



8 电路拓扑图

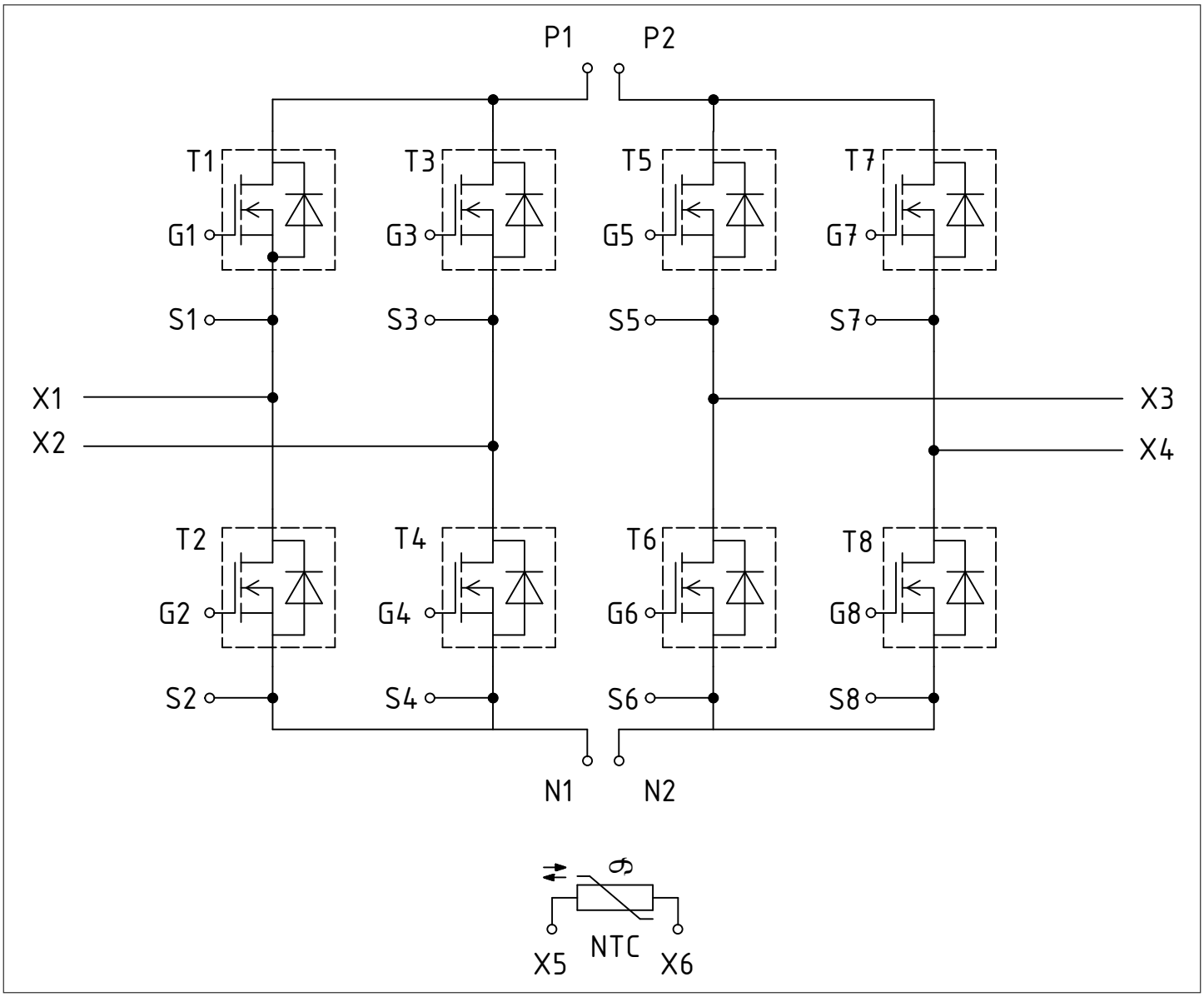

P1
P2
T1
T3
T5
T7
G1
G3
G5
G7
S1
S3
S5
S7
X1
X2
X3
X4
T2
T4
T6
T8
G2
G4
G6
G8
S2
S4
S6
S8
N1
N2
NTC
X5
X6

图 1

9 封装尺寸

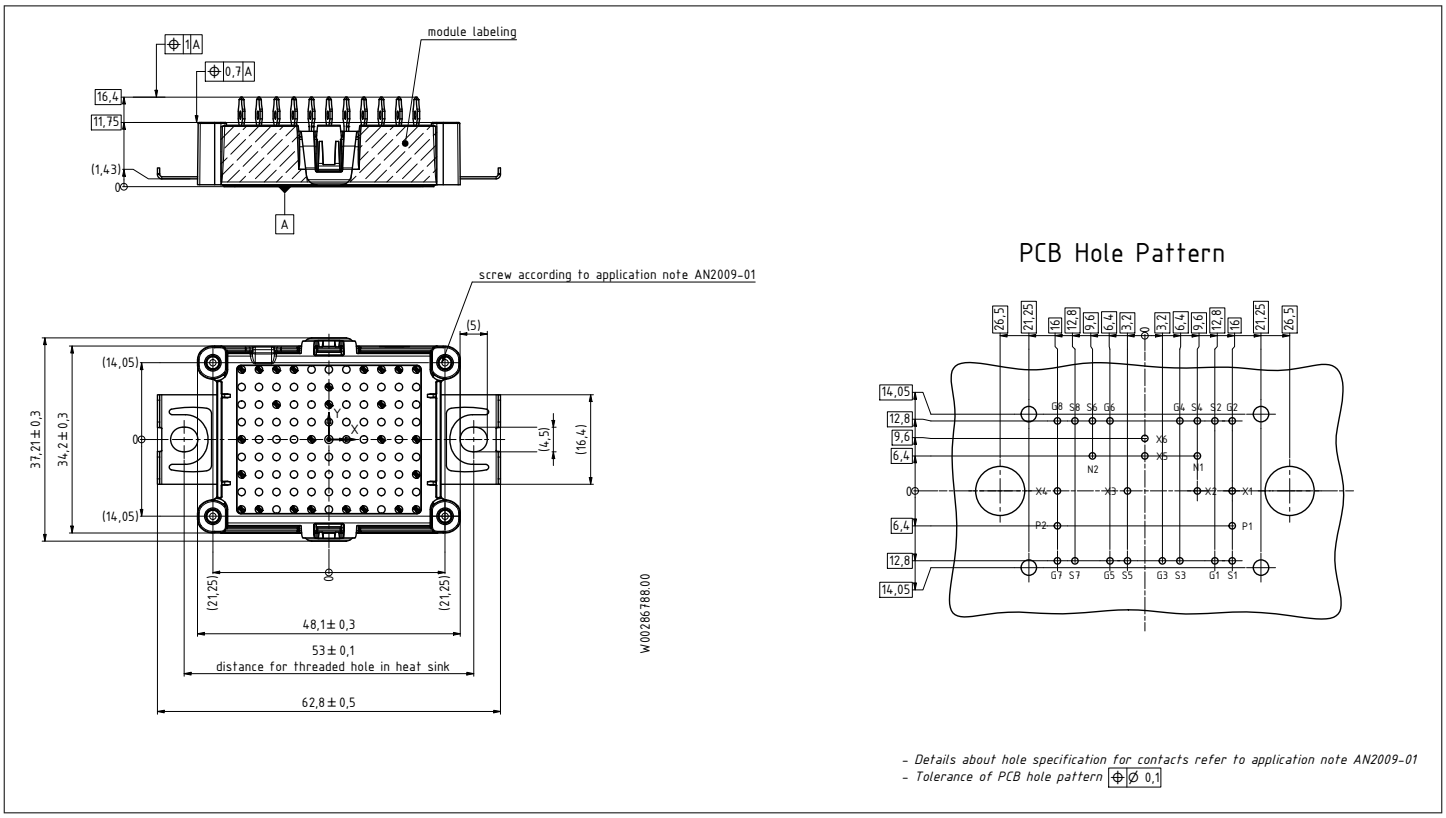

module labeling
screw according to application note AN2009-01
PCB Hole Pattern
W00286788.00
- Details about hole specification for contacts refer to application note AN2009-01
- Tolerance of PCB hole pattern

图 2

10 模块标签代码

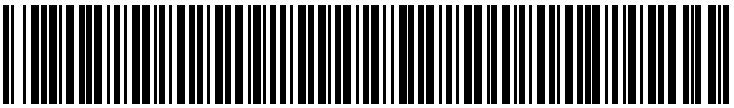
Module label code			
Code format	Data Matrix		Barcode Code128
Encoding	ASCII text		Code Set A
Symbol size	16x16		23 digits
Standard	IEC24720 and IEC16022		IEC8859-1
Code content	*Content* Module serial number Module material number Production order number Date code (production year) Date code (production week)	*Digit* 1 – 5 6 - 11 12 - 19 20 – 21 22 – 23	*Example* 71549 142846 55054991 15 30
Example	 71549142846550549911530	 71549142846550549911530	

图 3

修订历史

修订版本	发布日期	变更说明
0.10	2025-05-27	Target datasheet
0.20	2026-04-30	Preliminary Datasheet
1.00	2026-05-13	Final Datasheet

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