



ON Semiconductor®

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NGTB30N60L2WG

N-Channel IGBT 低VF开关二极管内置 600V, 30A, VCE(sat);1.4V

主要特长

- IGBT VCE(sat)=1.4V typ. (IC=30A, VGE=15V)
- IGBT IC=100A (Tc=25°C)
- IGBT tf=80ns typ.
- 高频应用用开关损失低
- 最高结温 Tj=175°C
- Diode VF=1.7V typ. (IF=30A)
- Diode trr=70ns typ.
- 5μs 抗短路能力
- 不含铅和卤, 遵守RoHS

应用

- 白物家电的功率因数校正

规格

绝对最大额定值 / Ta = 25°C (除非特殊指定)

参数	记号	值	单位
集电极-发射极电压(Collector to Emitter Voltage)	V _{CES}	600	V
栅极-发射极电压(Gate to Emitter Voltage)	V _{GES}	±20	V
集电极电流 (DC)	I _C *1	100	A
受限于 Tjmax		30	A
受脉冲作用的集电极电流 Pulsed collector current, tp=100ms 受限于 Tjmax	I _{Cpulse}	60	A
受脉冲作用的集电极电流(Pulsed collector current) tp=1ms 受限于 Tjmax	I _{Cpeak}	232	A
二极管平均输出电流(Diode Average Output Current)	I _O	30	A
功耗(Power Dissipation) Tc=25°C (我司的理想散热条件) *2	P _D	225	W
结温(Junction Temperature)	T _j	175	°C
储存温度(Storage Temperature)	T _{stg}	-55 to +175	°C

注: *1 集电极电流由下式计算:

$$I_C(T_c) = \frac{T_{jmax} - T_c}{R_{th(j-c)} \times V_{CE(sat)}(I_C(T_c))}$$

*2 我司的条件为背面散热。

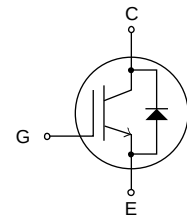
方法为:器件的背面涂上硅脂, 然后将该器件贴在 铝制的水冷散热器上。

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

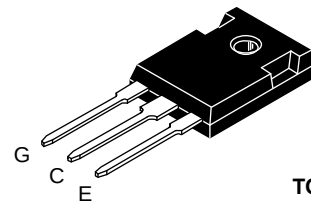
ORDERING INFORMATION

See detailed ordering and shipping information on page 8 of this data sheet.

电气连接图

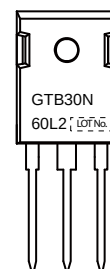


N-channel



TO-247
CASE 340AK

印刷图



NGTB30N60L2WG

电气特性 / Ta = 25°C (除非特殊指定)

参数	记号	条件	值			单位
			min	typ	max	
集电极-发射极击穿电压 (Collector to Emitter Breakdown Voltage)	V(BR)CES	IC=500μA, VGE=0V	600			V
集电极-发射极截止电流 (Collector to Emitter Cutoff Current)	ICES	VCE=600V, VGE=0V			10	μA
					1	mA
栅极-发射极漏电流 (Gate to Emitter Leakage Current)	IGES	VGE=±20V, VCE =0V			±100	nA
栅极-发射极阈值电压 (Gate to Emitter threshold voltage)	VGE(th)	VCE =20V, IC=250μA	4.5		6.5	V
集电极-发射极饱和电压 (Collector to Emitter Saturated Voltage) 正向二极管电压(Forward Diode Voltage)	VCE(sat)	VGE=15V, IC=30A		1.4	1.6	V
				1.7		V
		VGE=15V, IC=50A		1.65		V
输入电容(Input Capacitance)	VF	IF=30A		1.7		V
输出电容(Output Capacitance)	Cies	VCE =20V, f=1MHz		4130		pF
集电极-发射极击穿电压 (Collector to Emitter Breakdown Voltage)	Coes			114		pF
反向传输电容 (Reverse Transfer Capacitance)	Cres			96		pF
开启延迟时间(Turn-on delay time)	t _d (on)	VCC=300V, IC=30A RG=30Ω, L=200μH VGE=0V/15V Vclamp=400V 参照图 1, 图 2		100		ns
上升时间(Rise Time)	t _r			60		ns
开启时间(Turn-ON Time)	ton			540		ns
关断延迟时间(Turn-OFF Delay Time)	t _d (off)			390		ns
下降时间(Fall Time)	t _f			80		ns
关断时间(Turn-OFF Time)	toff			500		ns
开启能量(Turn-ON Energy)	Eon			0.31		mJ
关断能量(Turn-OFF Energy)	Eoff			1.14		mJ
开启延迟时间(Turn-on delay time)	t _d (on)	VCC=300V, IC=50A RG=30Ω, L=200μH VGE=0V/15V Vclamp=400V 参照图 1, 图 2		98		ns
上升时间(Rise Time)	t _r			85		ns
开启时间(Turn-ON Time)	ton			650		ns
关断延迟时间(Turn-OFF Delay Time)	t _d (off)			380		ns
下降时间(Fall Time)	t _f			90		ns
关断时间(Turn-OFF Time)	toff			530		ns
开启能量(Turn-ON Energy)	Eon			0.638		mJ
关断能量(Turn-OFF Energy)	Eoff			2.755		mJ
总栅极电荷(Total Gate Charge)	Qg	VCE =300V, VGE=15V, IC=30A		166		nC
栅极-发射极电荷(Gate to Emitter charge)	Qge			40		nC
栅极-集电极米勒电荷 (Gate to Collector "Miller" Charge)	Qgc			70		nC
二极管反向恢复时间 (Diode Reverse Recovery Time)	t _{rr}	IF=10A, di/dt=100A/μs, VCC=50V, See Fig.3		70		ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

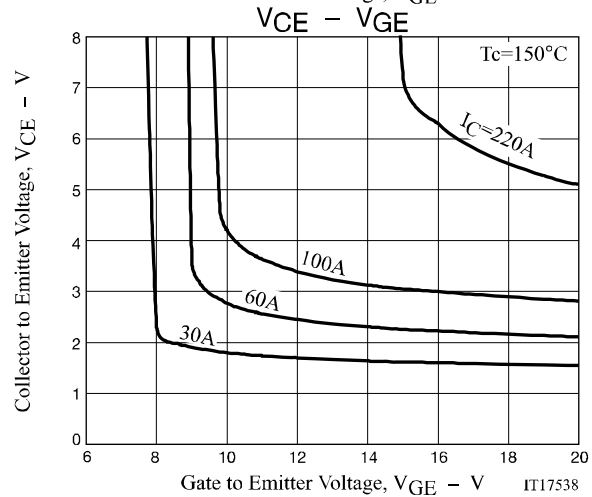
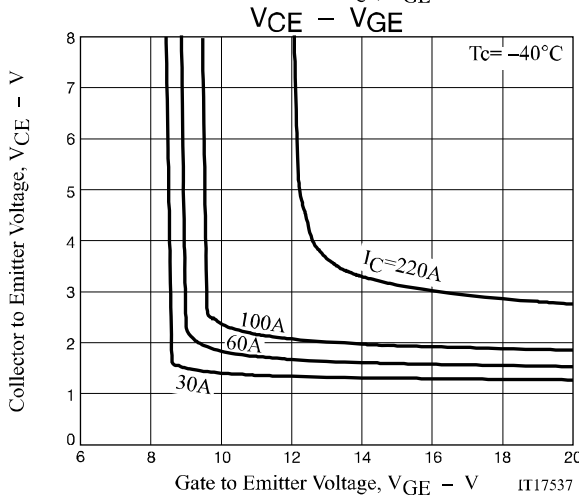
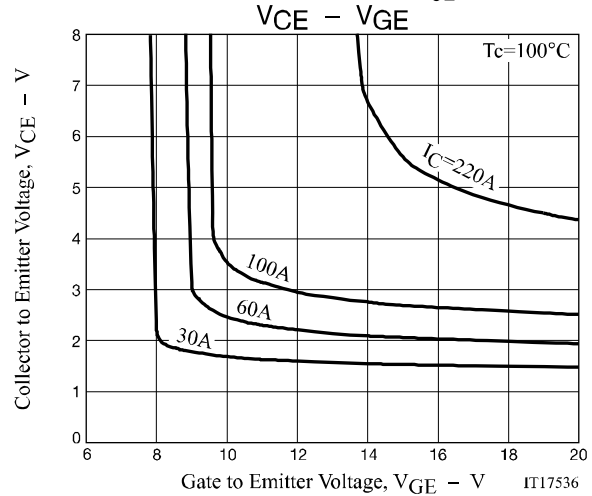
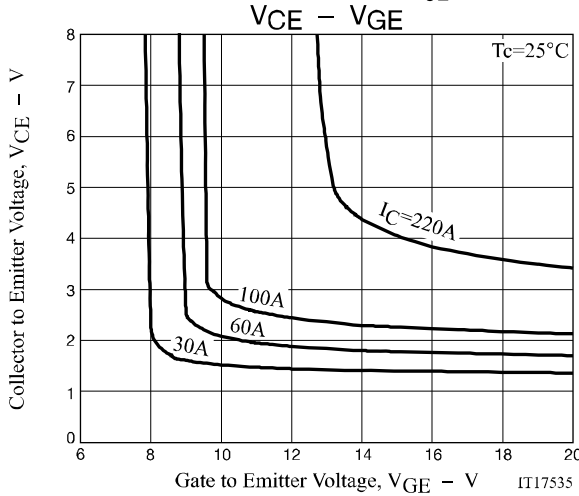
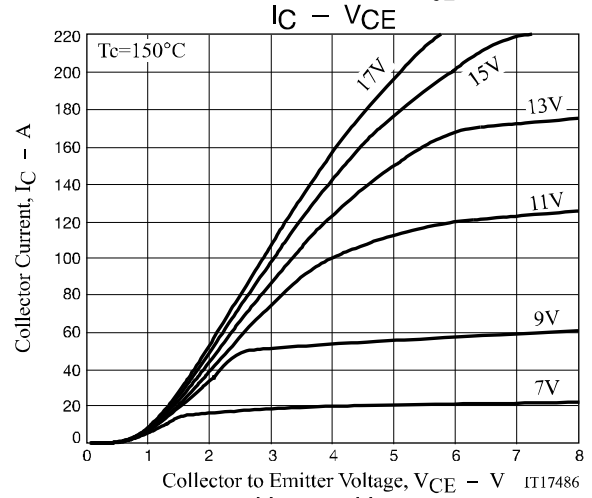
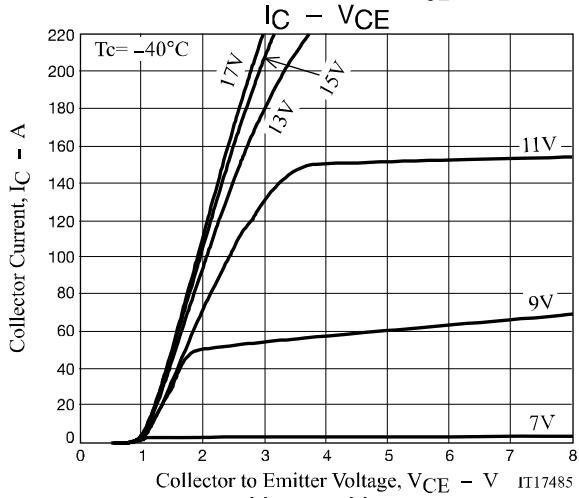
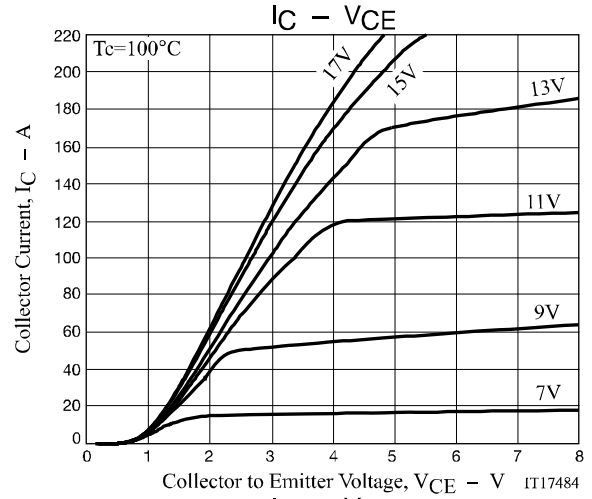
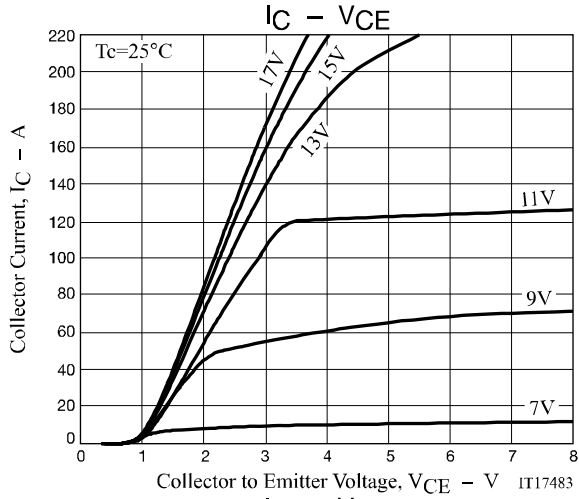
热特性 / Ta = 25°C (除非特殊指定)

参数	记号	条件	值	单位
热阻 IGBT(结到外壳) Thermal Resistance IGBT (Junction to Case)	Rth(j-c) (IGBT)	Tc=25°C (我司的理想散热条件)*2	0.67	°C /W
热阻二极管(结到外壳) Thermal Resistance Diode (Junction to Case)	Rth(j-c) (Diode)	Tc=25°C (我司的理想散热条件)*2	1.5	°C /W
热阻(结到环境) Thermal Resistance (Junction to Ambient)	Rth(j-a)		41	°C /W

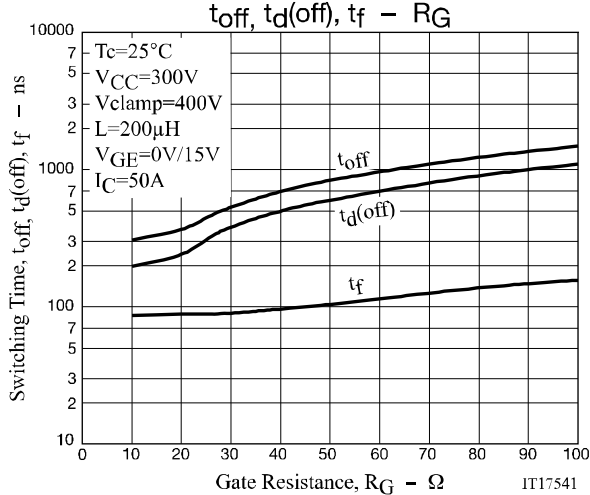
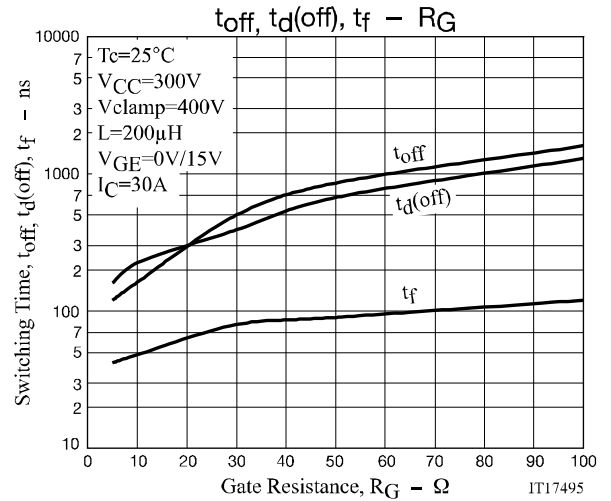
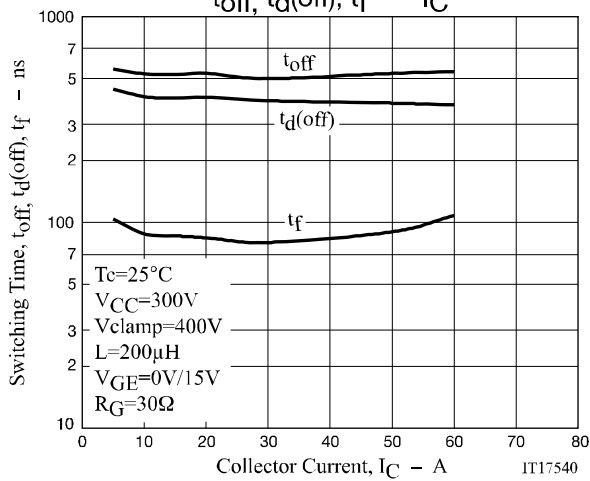
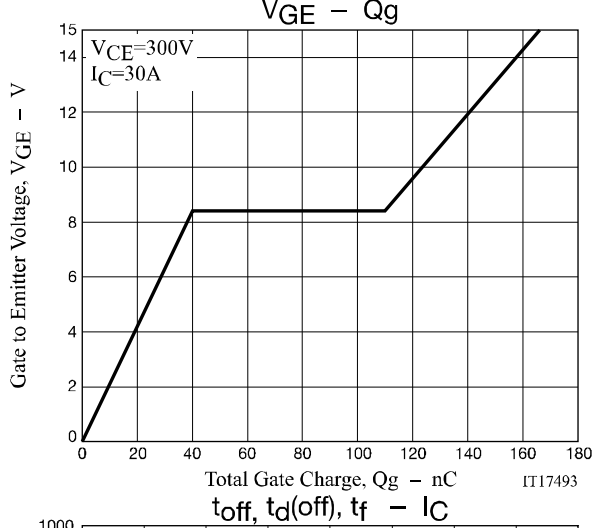
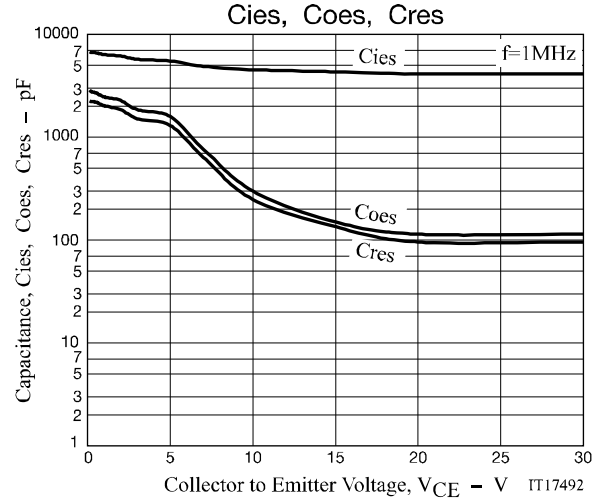
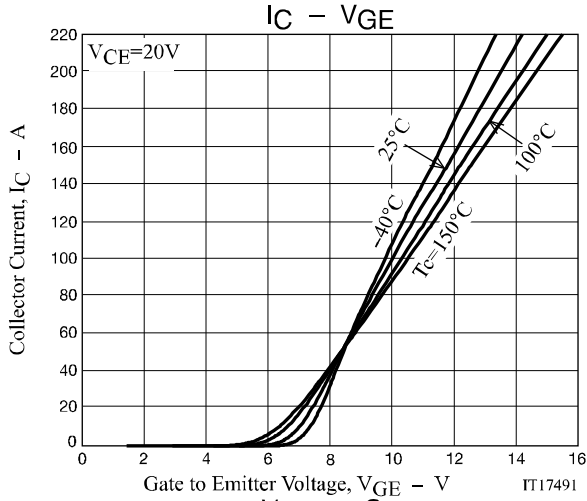
注: *2 我司的条件为背面散热。

方法为:器件的背面涂上硅脂, 然后将该器件贴在 铝制的水冷散热器上。.

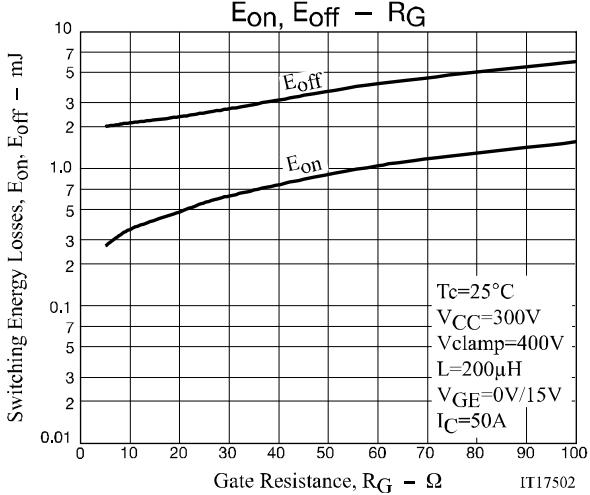
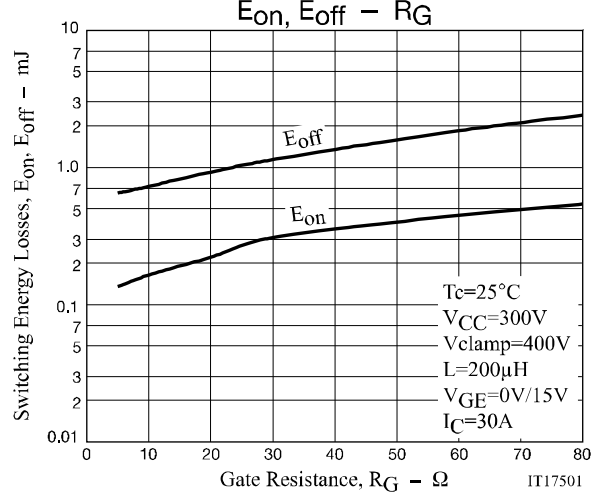
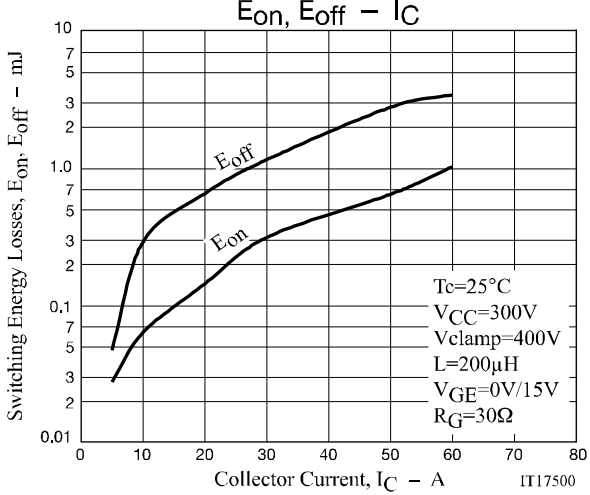
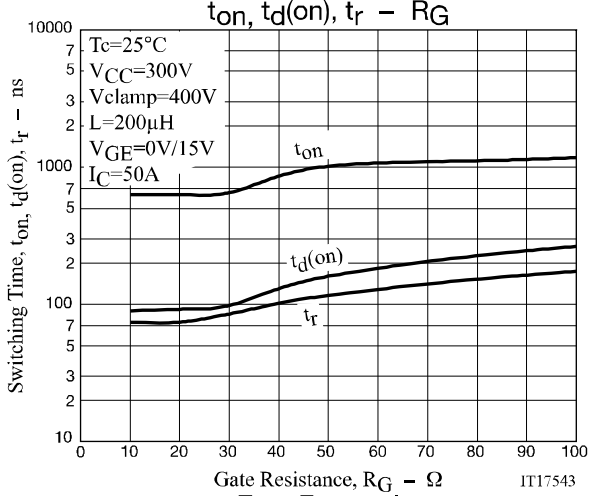
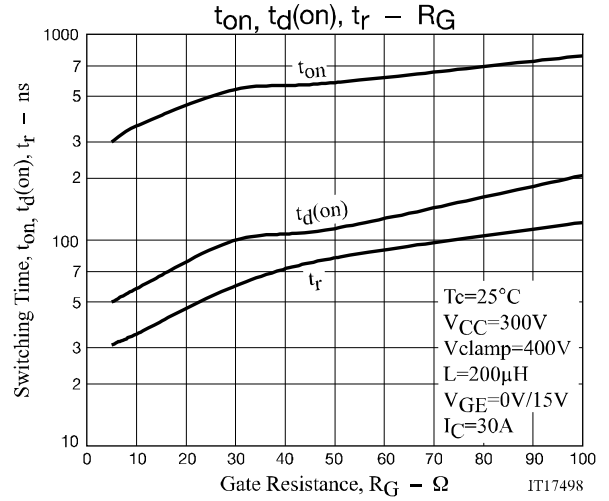
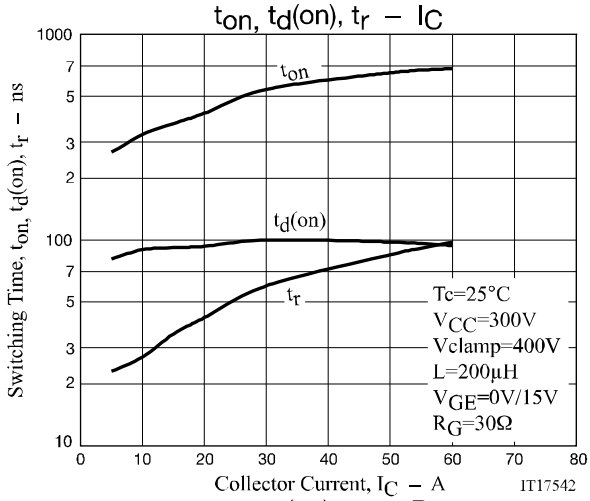
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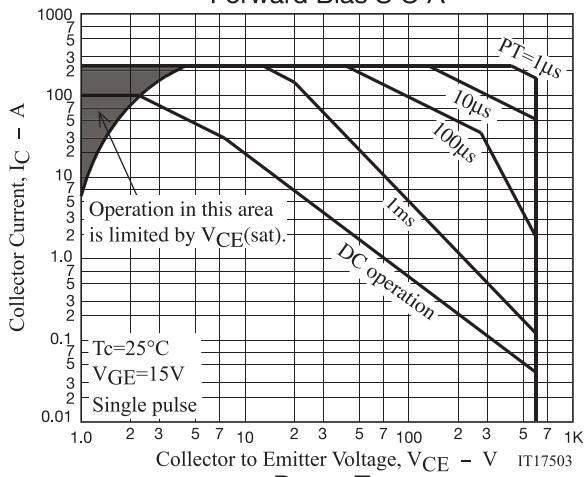


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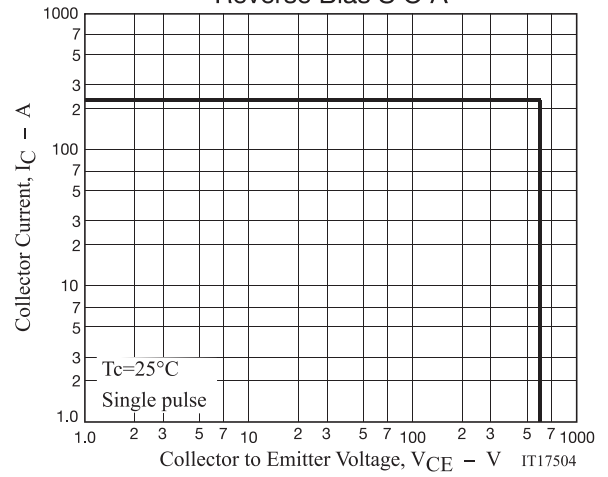


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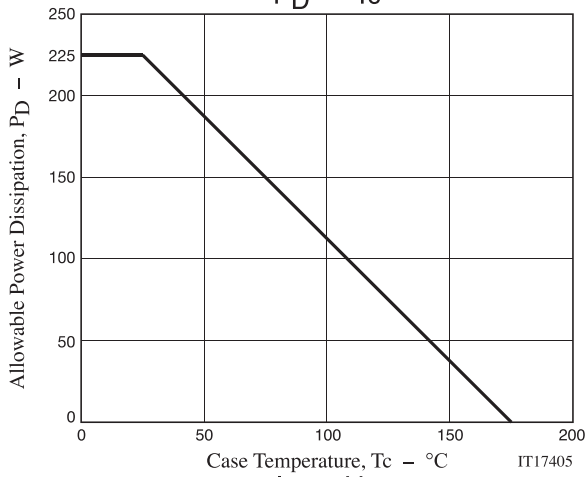
Forward Bias S O A



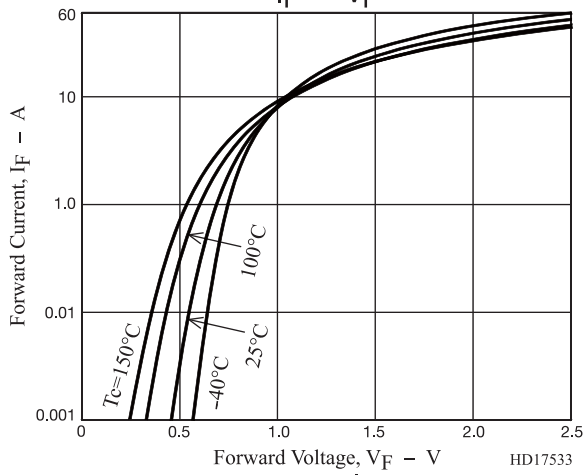
Reverse Bias S O A



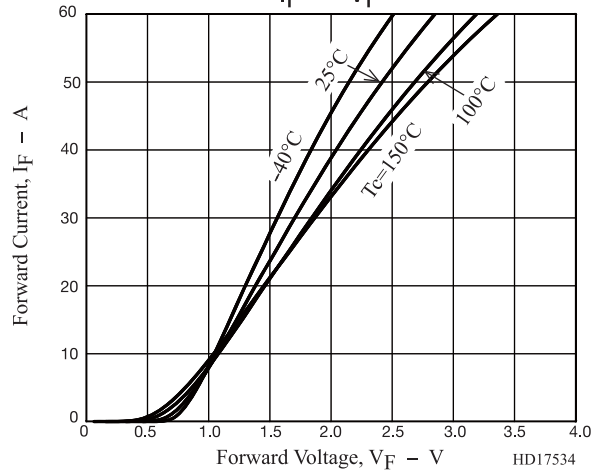
PD - Tc



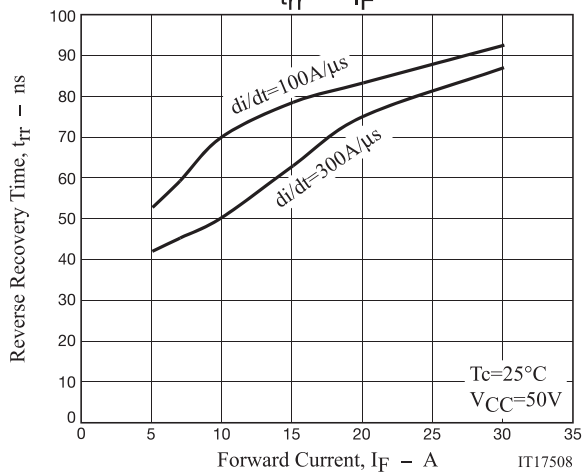
IF - VF



IF - VF



ttr - IF



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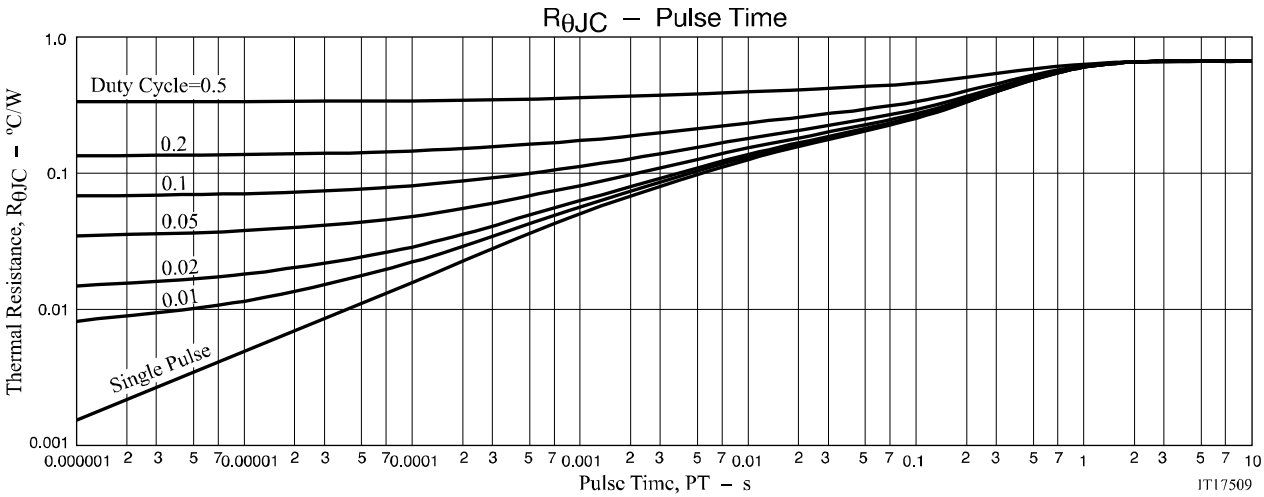


图 1：开关时间测试电路

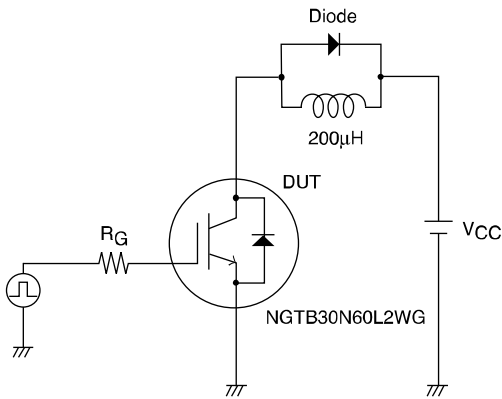


图 2：时间图

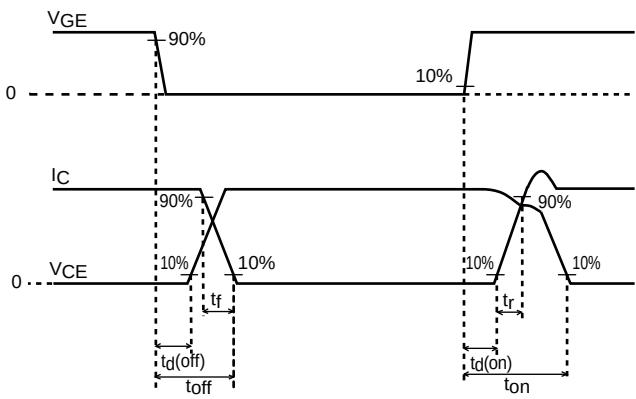
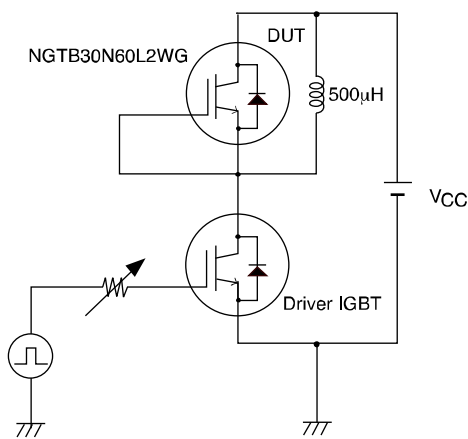
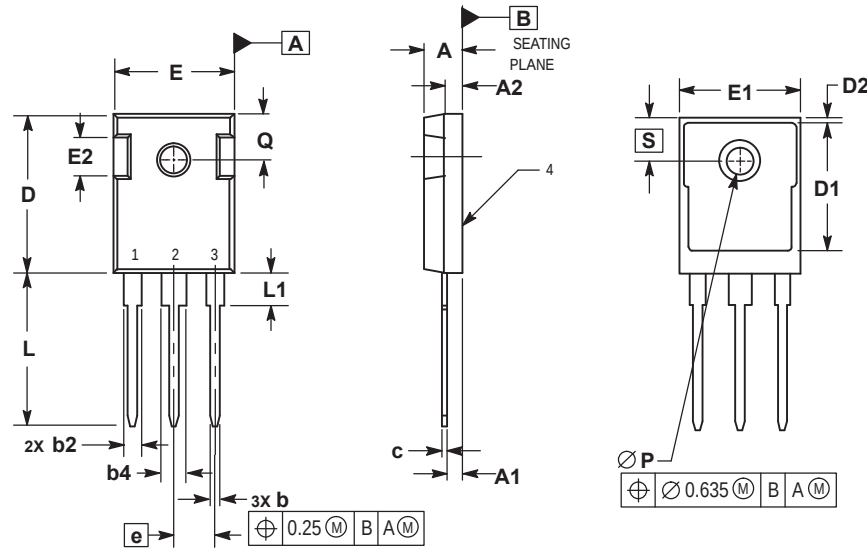


图 3：反向恢复时间测试电路



封装尺寸

TO-247
CASE 340AK
ISSUE O



1 : Gate
2 : Collector
3 : Emitter

- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY.
 4. SLOT REQUIRED, NOTCH MAY BE ROUNDED.
 5. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS D1 AND E1.
 6. LEAD FINISH UNCONTROLLED WITHIN L1.
 7. $\varnothing P$ TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5° TO THE TOP OF THE PART WITH A MAXIMUM DIAMETER OF 3.91.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.70	5.31	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	1.00	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.80	21.46	0.819	0.845
D1	13.08	---	0.515	---
D2	0.51	1.35	0.020	0.053
E	15.49	16.26	0.610	0.640
E1	13.46	---	0.530	---
E2	4.32	5.49	0.170	0.216
e	5.46 BSC	---	0.215 BSC	---
L	19.81	20.32	0.780	0.800
L1	---	4.50	---	0.177
P	3.56	3.66	0.140	0.144
Q	5.38	6.20	0.212	0.244
S	6.15 BSC	---	0.242 BSC	---

订单及封装情况

器件名称	封装	出货包装	注解
NGTB30N60L2WG	TO-247-3L	30 pcs. / tube	不含铅和卤

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