

**3DD13005 G7D****General Description**

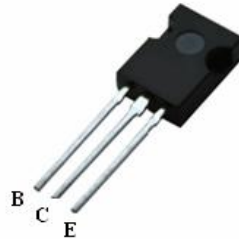
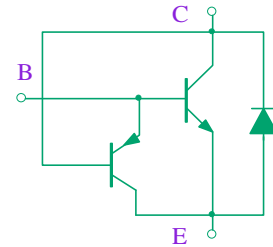
3DD13005 G7D, the silicon NPN power switch transistor, is manufactured using planar technology, terminal guard ring structure and minority life-time controlling technology for realization of high voltage capability, high switching speeds and reliability.

Main Characteristics

Symbol	Value	Unit
V_{CEO}	400	V
I_C	4	A
P_{tot} ($T_C=25^\circ\text{C}$)	50	W

Characteristics

- Low Switching Power Loss
- Low Reverse Leakage Current
- Excellent Stability at High Temperature
- Optimized Switching Capability
- Enhanced Long Term Reliability

Package TO-126F**Equivalent circuit****Applications**

- Energy-Saving Lamp
- Electronic Ballast
- Common Power Amplifier Circuit

Storage Conditions and Soldering

Valid Time	Storage Conditions	Soldering T_{max}
1Year	$T_a -10^\circ\text{C} \sim 40^\circ\text{C}$ <85%RH	265 $^\circ\text{C}$

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	700	V
Collector-Emitter Voltage	V_{CEO}	400	V
Emitter- Base Voltage	V_{EBO}	9	V
Collector Current (DC)	I_C	4	A
Collector Peak Current ($t_p < 5\text{ms}$)	I_{CM}	8	A
Base Current (DC)	I_B	2	A
Base Peak Current ($t_p < 5\text{ms}$)	I_{BM}	4	A
Total Power Dissipation	P_{tot}	$T_a=25^\circ\text{C}$	1.25
		$T_C=25^\circ\text{C}$	50
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~150	$^\circ\text{C}$



3DD13005 G7D



Electrical Characteristics (Ta= 25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Criterion			Unit
			Min.	Typ.	Max.	
Collector-Base Cut-off Current	I_{CBO}	$V_{CB}=700V, I_E=0$			0.1	mA
Collector-Emitter Cut-off Current	I_{CEO}	$V_{CE}=400V, I_B=0$			0.1	mA
Emitter-Base Cut-off Current	I_{EBO}	$V_{EB}=9V, I_C=0$			0.1	mA
Collector-Base Voltage	V_{CBO}	$I_C=0.1mA$	700			V
Collector-Emitter Voltage	V_{CEO}	$I_C=1mA$	400			V
Emitter- Base Voltage	V_{EBO}	$I_E=0.1mA$	9			V
DC Current Gain	h_{FE}^*	$V_{CE}=5V, I_C=1A$	15		30	
Ratio Between h_{FE1} and h_{FE2}	h_{FE1}/h_{FE2}	$h_{FE1}:V_{CE}=5V, I_C=50mA$ $h_{FE2}:V_{CE}=5V, I_C=1A$	0.6	0.7		
Collector-Emitter Saturation Voltage	$V_{CE sat}^*$	$I_C=2A, I_B=0.5A$		0.35	1	V
Base- Emitter Saturation Voltage	$V_{BE sat}^*$	$I_C=2A, I_B=0.5A$		0.95	1.5	V
Forward Voltage Drop	V_f^*	$I_f = 2 A$			2.5	V
Storage Time	t_s	UI9600, $I_C=0.5A$	1.5		3	μs
Rise Time	t_r				1	μs
Fall Time	t_f				0.8	μs
Transition Frequency	f_T	$V_{CE}=10V, I_C=0.2A$ $f=1MHz$	5			MHz

* Impulse Test Pulse Width $tp \leq 300\mu s$; Duty Cycle $\delta \leq 2\%$

◆ t_s Classifications 1.5~2~2.5~3 μs h_{FE} Classifications 15~20~25~30

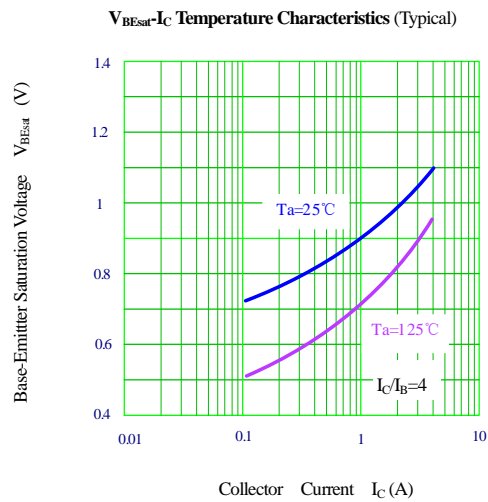
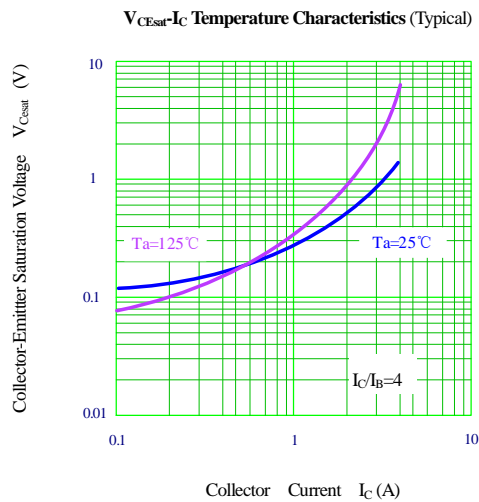
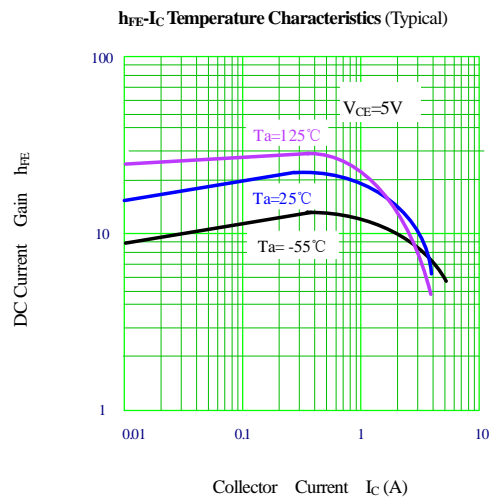
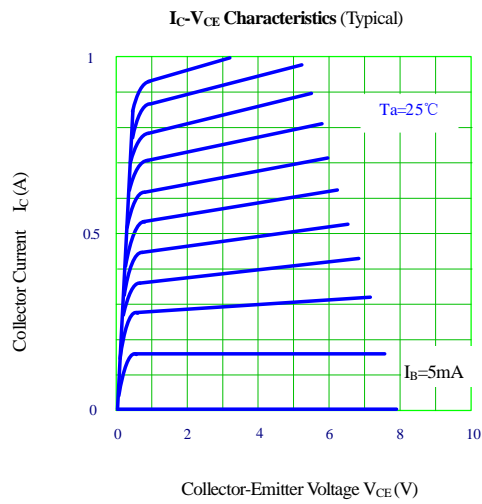
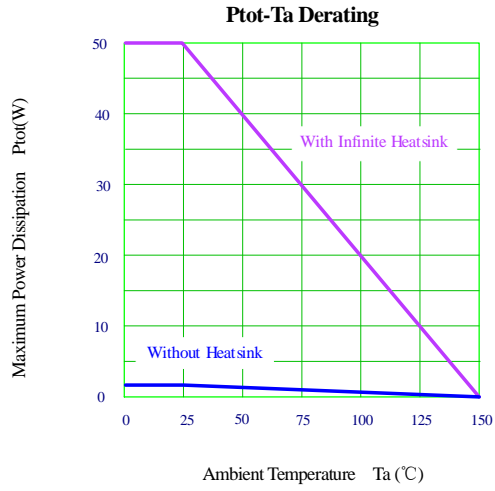
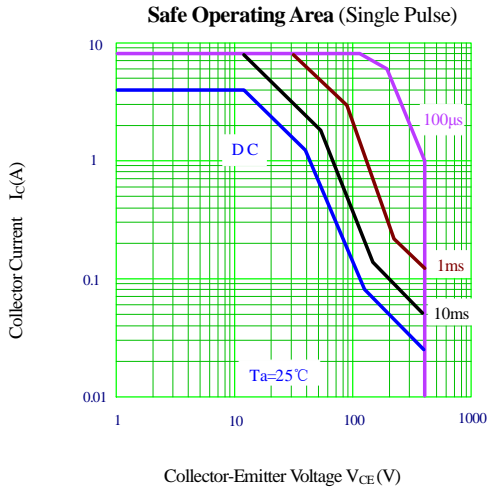
Thermal Resistances

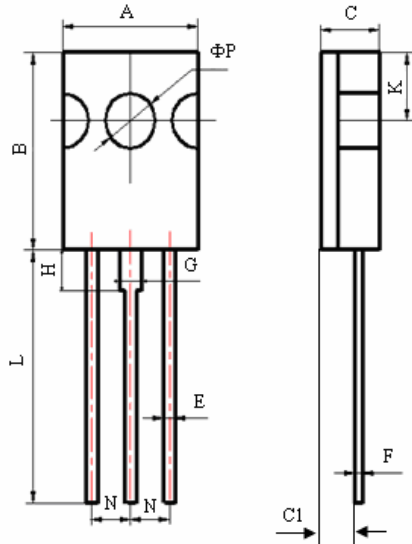
Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$			2.5	$^{\circ}C/W$
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$			100	$^{\circ}C/W$

About of Hazardous Substance

Part's Name (Content)	Hazardous Substance									
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE	HBCDD	DEHP	DBP	BBP
	$\leq 0.1\%$	$\leq 0.1\%$	$\leq 0.01\%$	$\leq 0.1\%$	$\leq 0.1\%$	$\leq 0.1\%$	$\leq 0.1\%$	$\leq 0.1\%$	$\leq 0.1\%$	$\leq 0.1\%$
Lead Frame	○	○	○	○	○	○	○	○	○	○
Molding Compound	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
Wire Bonding	○	○	○	○	○	○	○	○	○	○
Solder	×	○	○	○	○	○	○	○	○	○
Note	○: Means the hazardous material is under the criterion of SJ/T11363-2006. ×: Means the hazardous material exceeds the criterion of SJ/T11363-2006. The plumbum element of solder exist in products presently, but within the allowed range of EU's RoHS.									

Electrical Characteristics (Curves)



External Dimensions TO-126F


Symbol	Criterion (mm)		
	Min.	Max.	
A	7.50	8.20	
B	10.30	11.20	
C	3.10	3.50	
C1	1.70	2.20	
E	0.60	0.80	
F	0.30	0.60	
G	1.17	1.37	
H	1.90	2.30	
K	3.60	3.80	
L	TO-126F	15.00	17.00
	TO-126F-T	8.50	9.50
	TO-126F-S	5.00	6.20
N	2.09	2.49	
Φ P	2.90	3.10	

Packing Explanation

- a) Small packing, 400 pieces per plate.
- b) Middle packing, 10 plates per middle paper box..
- c) Big packing, 5 boxes per big paper case.

Warnings

a) All the products made from Huajing Microelectronics should be in accordance with the corresponding electrical characteristics specifications and package sizes described in the publication. Interrelated technological compact must be signed in both sides before making the special products customers demand.

b) Exceeding the Maximum Ratings is forbidden when the device is working. It is suggested that the device works under 80% of the Maximum Ratings. During installation please try to reduce the mechanical stress to prevent the partial distortion and transmigration of the device case, which may result in application failure, avoid approaching to heat component, pay attention to the temperature and time in welding and adding stannum.

c) This publication is made by Huajing Microelectronics and subject to regular change without notice.

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