



5302D

NPN SILICON TRANSISTOR

HIGH VOLTAGE NPN TRANSISTOR WITH DIODE

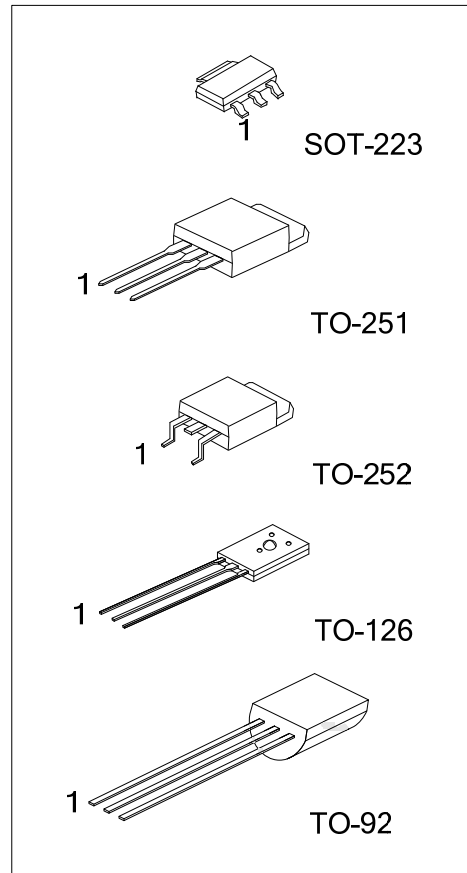
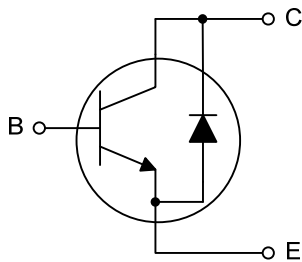
■ DESCRIPTION

The UTC **5302D** are series of NPN silicon planar transistor with diode and its suited to be used in power amplifier applications.

■ FEATURES

- * Internal free-wheeling diode
- * Makes efficient anti-saturation operation
- * Low variable storage-time spread
- * Low base drive
- * Very suitable for half bridge light ballast application

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
-	5302DG-AA3-R	SOT-223	B	C	E	Tape Reel
5302DL-T60-K	5302DG-T60-K	TO-126	B	C	E	Bulk
5302DL-T92-B	5302DG-T92-B	TO-92	E	C	B	Tape Box
5302DL-T92-K	5302DG-T92-K	TO-92	E	C	B	Bulk
5302DL-T92-R	5302DG-T92-R	TO-92	E	C	B	Tape Reel
5302DL-TM3-T	5302DG-TM3-T	TO-251	B	C	E	Tube
5302DL-TN3-R	5302DG-TN3-R	TO-252	B	C	E	Tape Reel

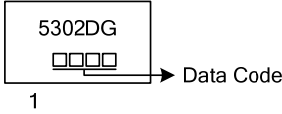
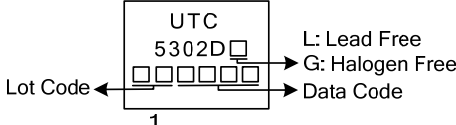
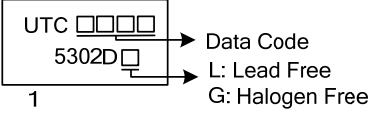
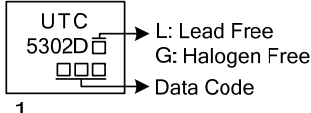
Note: Pin assignment: E: Emitter B: Base C: Collector

<p>5302DL-T60-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) B: Tape Box, K: Bulk, T: Tube, R: Tape Reel</p> <p>(2) T60: TO-126, T92: TO-92, TM3: TO-251, TN3: TO-252, AA3: SOT-223</p> <p>(3) L: Lead Free, G: Halogen Free and Lead Free</p>
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MARKING

SOT-223	TO-251 / TO-252
 <p>5302DG □□□□ → Data Code 1</p>	 <p>UTC 5302D □ □□□□ □ → Data Code Lot Code ← 1 L: Lead Free G: Halogen Free</p>
TO-126	TO-92
 <p>UTC □□□□ → Data Code 5302D □ → L: Lead Free G: Halogen Free 1</p>	 <p>UTC 5302D □ → L: Lead Free G: Halogen Free □□□ → Data Code 1</p>

■ ABSOLUTE MAXIMUM RATING ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		V_{CB0}	800	V
Collector-Emitter Voltage		V_{CEO}	400	V
Emitter-Base Voltage		V_{EBO}	10	V
Collector Current		I_C	2	A
Collector Peak Current ($t_p < 5\text{ms}$)		I_{CM}	4	A
Base Current		I_B	1	A
Base Peak Current ($t_p < 5\text{ms}$)		I_{BM}	2	A
Power Dissipation ($T_C \leq 25^{\circ}\text{C}$)	TO-126	P_D	12.5	W
	TO-92		1.6	
	TO-251/ TO-252		25	
	SOT-223		1	
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

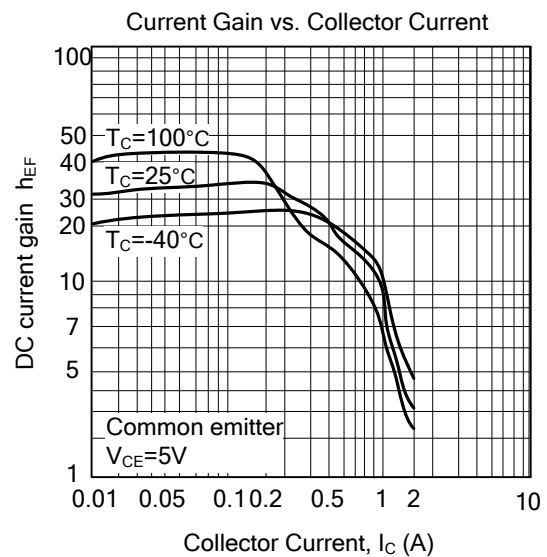
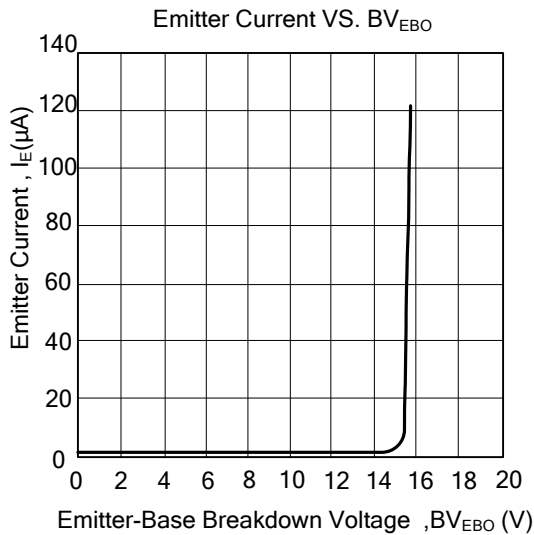
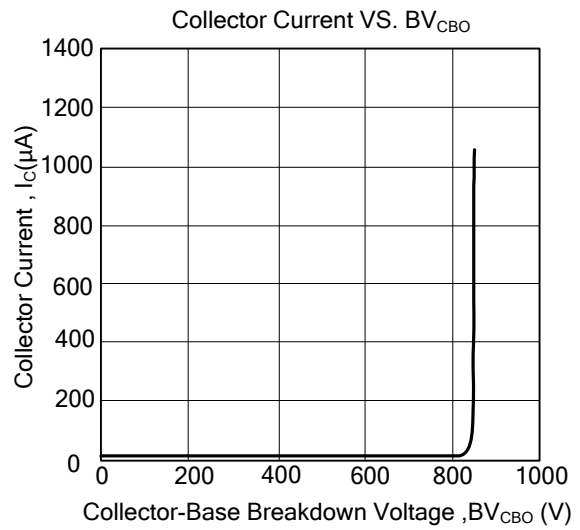
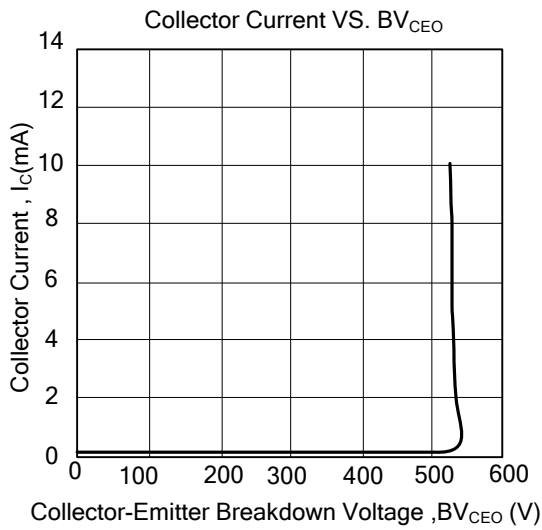
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-126	θ_{JA}	122	$^{\circ}\text{C}/\text{W}$
	TO-92		160	
	TO-251/ TO-252		100	
	SOT-223		175	
Junction to Case	TO-126	θ_{JC}	10	$^{\circ}\text{C}/\text{W}$
	TO-92		80	
	TO-251/ TO-252		5	
	SOT-223		125	

■ ELECTRICAL CHARACTERISTICS ($T_A = 25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=10\text{mA}$, $I_E=0$ (Note)	400			V
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C=1\text{mA}$, $I_B=0$	800			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=1\text{mA}$, $I_C=0$	10			V
Collector Cutoff Current	I_{CBO}	$V_{CB}=800\text{V}$, $I_E=0$			1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=9\text{V}$, $I_C=0$			1	μA
ON CHARACTERISTICS						
DC Current Gain	h_{FE1}	$V_{CE}=5\text{V}$, $I_C=10\text{mA}$	10			
	h_{FE2}	$V_{CE}=5\text{V}$, $I_C=400\text{mA}$	10		40	
	h_{FE3}	$V_{CE}=5\text{V}$, $I_C=1\text{A}$	5			
Collector-Emitter Saturation Voltage	$V_{CE(SAT1)}$	$I_C=0.5\text{A}$, $I_B=0.1\text{A}$ (Note)			0.5	V
	$V_{CE(SAT2)}$	$I_C=1\text{A}$, $I_B=0.25\text{A}$ (Note)		1.1	1.5	
Base-Emitter Saturation Voltage	$V_{BE(SAT1)}$	$I_C=0.5\text{A}$, $I_B=0.1\text{A}$ (Note)			1.1	V
	$V_{BE(SAT2)}$	$I_C=1\text{A}$, $I_B=0.25\text{A}$ (Note)			1.2	
SWITCHING CHARACTERISTICS						
Turn On Time	t_{ON}	$V_{CC}=250\text{V}$, $I_C=1\text{A}$,		0.15	0.3	μS
Fall Time	t_F	$I_{B1}=I_{B2}=0.2\text{A}$, $t_p=25\mu\text{S}$		0.2	0.4	μS
Storage Time	t_{STG}	Duty Cycle < 1%		0.5	0.9	μS
DIODE						
Forward Voltage Drop	V_F	$I_C=1\text{A}$			1.4	V
Fall Time	t_F	$I_C=1\text{A}$			800	μS

Note: Pulsed duration = $300\mu\text{S}$, Duty cycle $\leq 2\%$

TYPICAL CHARACTERISTICS



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