



## MPSA29

## NPN EPITAXIAL SILICON TRANSISTOR

### DARLINGTON TRANSISTOR

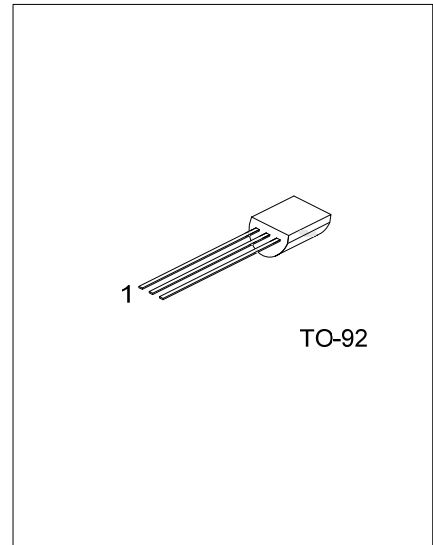
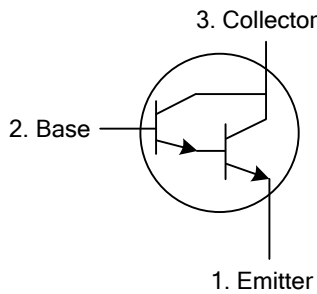
#### DESCRIPTION

The UTC **MPSA29** is a darlington transistor, it uses UTC's advanced technology to provide customers with high DC current gain, etc.

#### FEATURES

\* High DC current gain

#### EQUIVALENT CIRCUIT



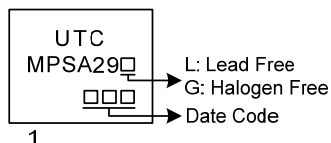
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MPSA29L-T92-B	MPSA29G-T92-B	TO-92	E	B	C	Tape Box
MPSA29L-T92-K	MPSA29G-T92-K	TO-92	E	B	C	Bulk

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

MPSA29G-T92-B		
(1)Packing Type	(1) B: Tape Box, K: Bulk	
(2)Package Type	(2) T92: TO-92	
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free	

#### MARKING



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

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	$V_{CBO}$	100	V
Collector-Emitter Voltage	$V_{CES}$	100	V
Emitter-Base Voltage	$V_{EBO}$	12	V
Collector Current-Continuous	$I_C$	500	mA
Power Dissipation @ $T_A=25^{\circ}\text{C}$	$P_D$	625	mW
Derate above $25^{\circ}\text{C}$		5.0	mW/ $^{\circ}\text{C}$
Total Device Dissipation @ $T_C=25^{\circ}\text{C}$	$P_D$	1.5	W
Derate above $25^{\circ}\text{C}$		12	mW/ $^{\circ}\text{C}$
Junction Temperature	$T_J$	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +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 CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction-to-Ambient	$\theta_{JA}$	200	$^{\circ}\text{C}/\text{W}$
Junction-to-Case	$\theta_{JC}$	83.3	$^{\circ}\text{C}/\text{W}$

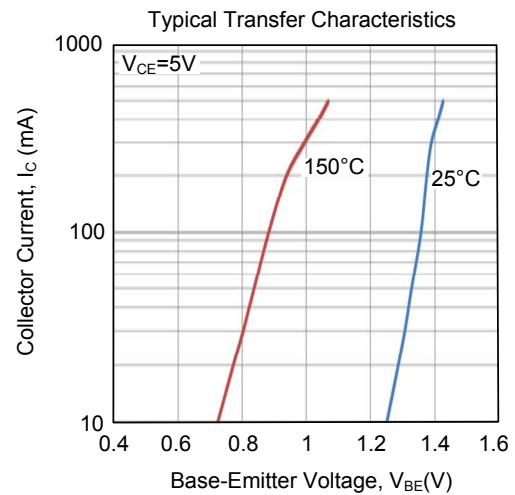
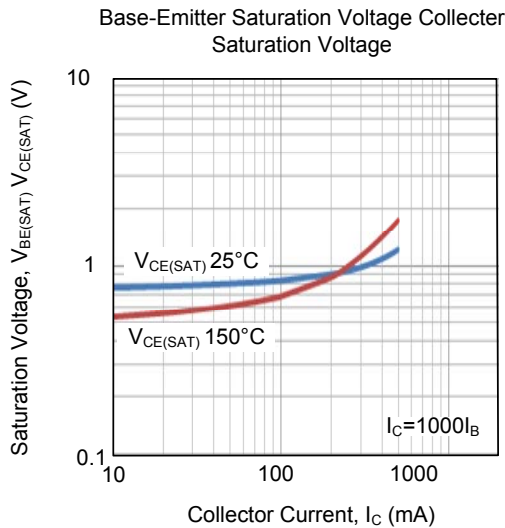
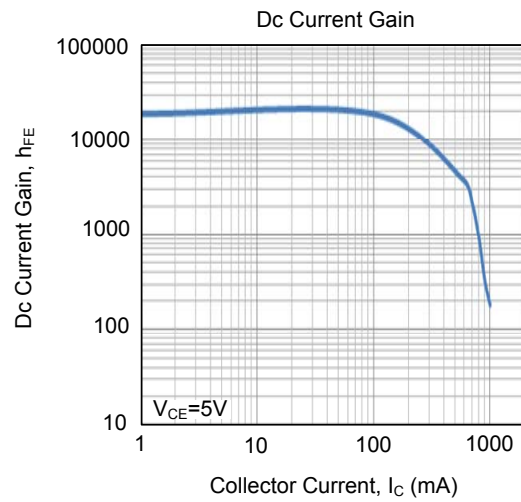
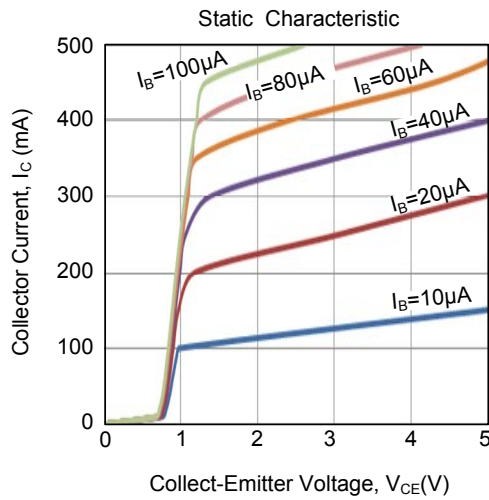
■ ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Collector-Emitter Breakdown Voltage	$BV_{CES}$	$I_C=100\mu\text{A}, V_{BE}=0$	100			V
Collector-Base Breakdown Voltage	$BV_{CBO}$	$I_C=100\mu\text{A}, I_E=0$	100			V
Emitter-Base Breakdown Voltage	$BV_{EBO}$	$I_E=10\mu\text{A}, I_C=0$	12			V
Collector Cut-Off Current	$I_{CBO}$	$V_{CB}=80\text{V}, I_E=0$			100	nA
	$I_{CES}$	$V_{CE}=80\text{V}, V_{BE}=0$			500	nA
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB}=10\text{V}, I_C=0$			100	nA
<b>ON CHARACTERISTICS (Note 1)</b>						
DC Current Gain	$h_{FE}$	$V_{CE}=5.0\text{V}, I_C=10\text{mA}$	10000			
		$V_{CE}=5.0\text{V}, I_C=100\text{mA}$	10000			
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=10\text{mA}, I_B=0.01\text{mA}$		0.7	1.2	V
		$I_C=100\text{mA}, I_B=0.1\text{mA}$		0.8	1.5	V
Base-Emitter On Voltage	$V_{BE(on)}$	$I_C=100\text{mA}, V_{CE}=5.0\text{V}$		1.4	2.0	V
<b>SMALL-SIGNAL CHARACTERISTICS</b>						
Current-Gain -Bandwidth Product (Note 2)	$f_T$	$I_C=10\text{mA}, V_{CE}=5.0\text{V}, f=100\text{MHz}$	125	200		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10\text{V}, I_E=0, f=1.0\text{MHz}$		5.0	8.0	pF

Notes: 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$ , Duty Cycles $\leq 2.0\%$ .

2.  $f_T = h_{FE} \times f_{est}$

## ■ TYPICAL CHARACTERISTICS



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