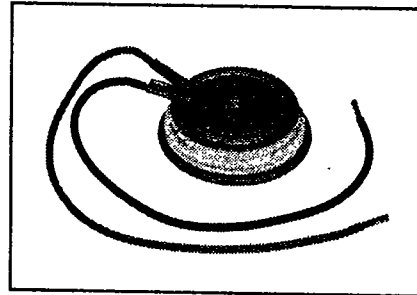
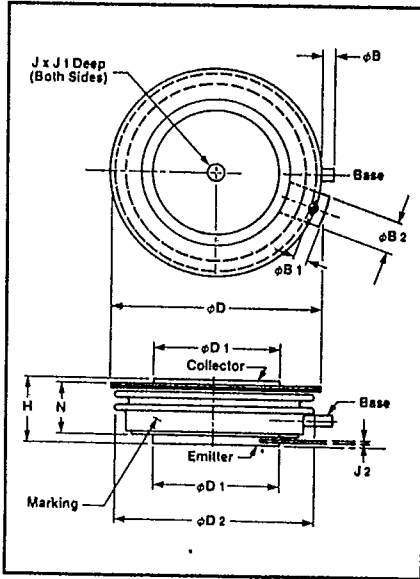




**D7ST1008, D7ST1010,
D7ST1012 Tentative**

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

**NPN
Power Switching
Transistors
80-120 Amperes/1000 Volts**



**D7ST1008/1010/1012
NPN Power Switching Transistors
80-120 Amperes/1000 Volts**

**D7ST1008/1010/1012, 1000 Volts
Outline Drawing**

Dimension	Inches		Millimeters	
	Min.	Max.	Min.	Max.
φB	.121	.171	3.07	4.34
φB ₁	.097	.122	.246	3.10
φB ₂	.307	.317	7.80	8.05
φD	1.824	1.99	46.3	50.55
φD ₁	1.155	1.161	29.34	29.49
φD ₂	1.78	1.85	45.21	46.99
H	.611	.635	1.55	1.66
J ₁	.136	1.44	3.45	3.66
J ₁	.072	.083	1.83	2.11
J ₂	.067	.071	1.70	1.803
N	.433	.453	11.0	11.51

Creep Distance—.390 in. min. (9.9mm)
Strike Distance—.145 in. min. (3.6mm).
Finish—Nickel Plate,
Approx. Weight—3.7 oz. (105 g.)
Dimension H is a clamped dimension.

Features:

- Triple Diffused Design
- Compression Bonded Construction
- High Power Capability
- Fast Switching
- Double Sided Cooling

Applications:

- High Frequency Inverters
- Motor Controls
- Switching Regulators
- VLF Transmitters
- Induction Heating
- Power Supplies

Ordering Information

Example: Select the complete ten digit part number you desire from the table—i.e. a D7ST100805 describes a disc package transistor rated at 1000 Volts, 80 Amperes, and a gain of 5 at rated current (80 Amperes).

Type	V _{CE(sus)} Volts (× 100)	Current Rating Amperes (× 10)	Gain
D7ST	10	08	05
		10	
		12	



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Maximum Ratings

Characteristics	Symbol	D7ST1008 D7ST1010 D7ST1012		Units
Operating and Storage Temperature	T_J/T_{STG}	-65 to 200		$^{\circ}\text{C}$
Collector-Emitter Sustaining Voltage	$V_{CEO(SUS)}$	800		Volts
Collector-Base Voltage	V_{CBO}	1000		Volts
Emitter-Base Voltage	V_{EBO}	7		Volts
Collector-Emitter Voltage $V_{BE} = -1.5\text{V}$	V_{CEV}	1000		Volts
Peak Collector Current	I_C	400		Amperes
Continuous Base Current	I_B	75		Amperes
Linear Power Derating Factor from $T_C = 25^{\circ}\text{C}$ to $T_C = 175^{\circ}\text{C}$	—	20		$\text{W}/^{\circ}\text{C}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$.05		$^{\circ}\text{C}/\text{W}$
Power Dissipation $T_C = 25^{\circ}\text{C}$	P_T	3000		Watts
Power Dissipation $T_C = 75^{\circ}\text{C}$	P_T	2000		Watts
Mounting Force	—	1200		lb.
Mounting Force	—	5.4		kN

POWEREX

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Electrical and Mechanical Characteristics $T_c, T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	D7ST1008 D7ST1010 D7ST1012		Units
				Typ.	Max.	
Collector Cutoff Current (Base Emitter Reverse Biased)	I_{CEV}	$V_{CEV} = 1000V$ $V_{EB(OFF)} = -1.5V$	—	—	8	mA
Collector Cutoff Current (Base Emitter Reverse Biased)	I_{CEV}	$V_{CEV} = 1000V$ $V_{BE(OFF)} = -1.5V, T_j = 150^\circ\text{C}$	—	—	10	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7V$	—	—	100	mA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = \text{Gain Rated Value}, I_B = 24A$	—	—	1.5	Volts
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = \text{Gain Rated Value}, I_B = 24A$	—	—	2.0	Volts
Thermal Resistance, Junction to Case Double Sided Cooling	$R_{\theta JC}$	$V_{CE} = 20V$	—	—	.05	$^\circ\text{C/W}$
Thermal Resistance Case to Sink Double Sided Cooling	$R_{\theta CS}$	$V_{CE} = 20V$ Lubricated	—	—	.02	$^\circ\text{C/W}$
D7ST1008						
DC Current Gain	h_{FE}	$I_C = 80A, V_{CE} = 2.5V$	—	5	—	—
Turn-On Delay	t_d	$V_{CC} = 250V, I_C = 80A$	—	—	300	ns
Resistive Load Rise Time	t_r	$I_{B1} = -I_{B2} = 15A$	—	—	1.0	μs
Switch Times Storage Time	t_s	$t_p = 50 \mu\text{s}$	—	—	4	μs
Fall Time	t_f	Duty Cycle < 2%	—	—	0.75	μs
D7ST1010						
DC Current Gain	h_{FE}	$I_C = 100A, V_{CE} = 2.5V$	—	5	—	—
Turn-On Delay	t_d	$V_{CC} = 250V, I_C = 100A$	—	—	325	ns
Resistive Load Rise Time	t_r	$I_{B1} = -I_{B2} = 18.75A$	—	—	1.1	μs
Switch Times Storage Time	t_s	$t_p = 50 \mu\text{s}$	—	—	4.25	μs
Fall Time	t_f	Duty Cycle < 2%	—	—	0.8	μs
D7ST1012						
DC Current Gain	h_{FE}	$I_C = 120A, V_{CE} = 2.5V$	—	5	—	—
Turn-On Delay	t_d	$V_{CC} = 250V, I_C = 120A$	—	—	350	ns
Resistive Load Rise Time	t_r	$I_{B1} = -I_{B2} = 22.5A$	—	—	1.2	μs
Switch Times Storage Time	t_s	$t_p = 50 \mu\text{s}$	—	—	4.5	μs
Fall Time	t_f	Duty Cycle < 2%	—	—	0.85	μs

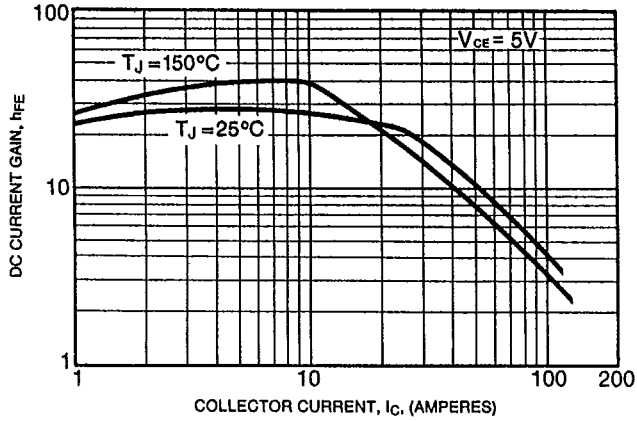


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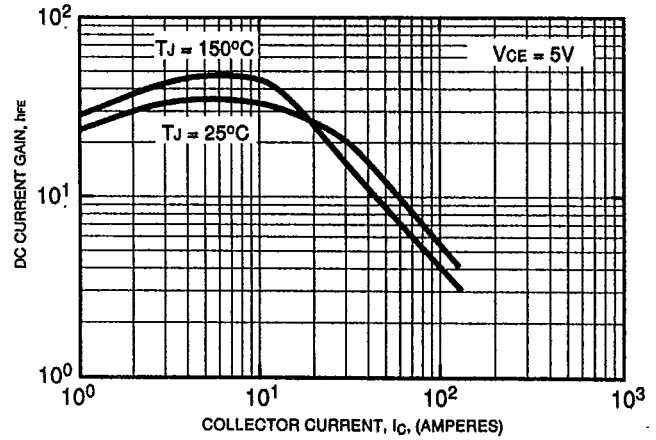
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D7ST1008, D7ST1010, D7ST1012
NPN Power Switching Transistors
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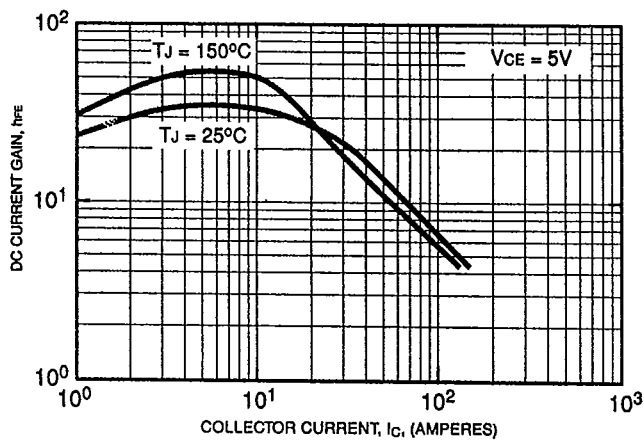
DC CURRENT GAIN (TYPICAL)
D7ST1008



DC CURRENT GAIN (TYPICAL)
D7ST1010



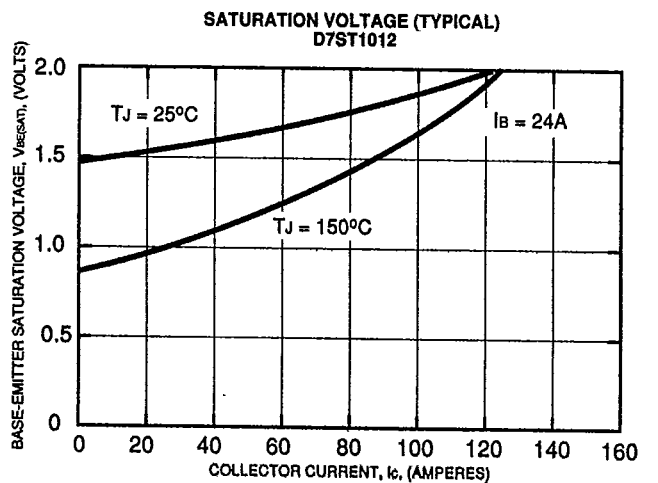
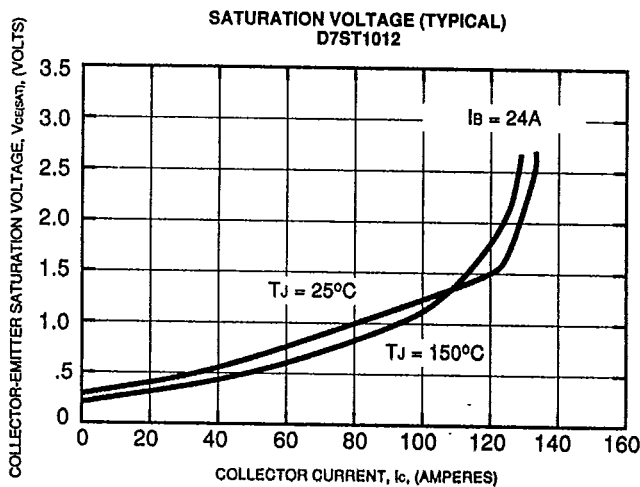
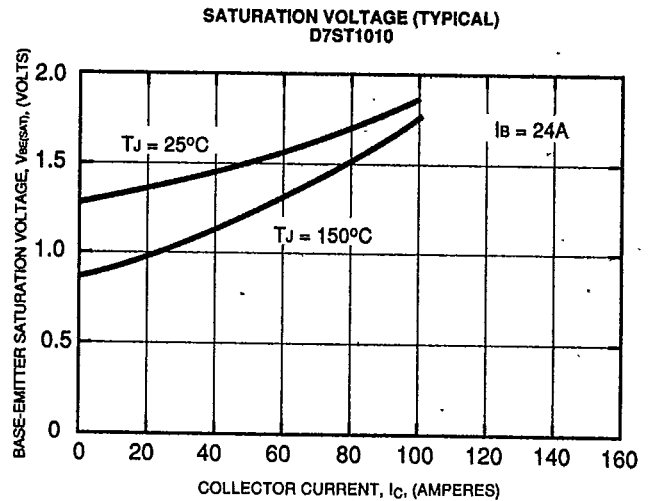
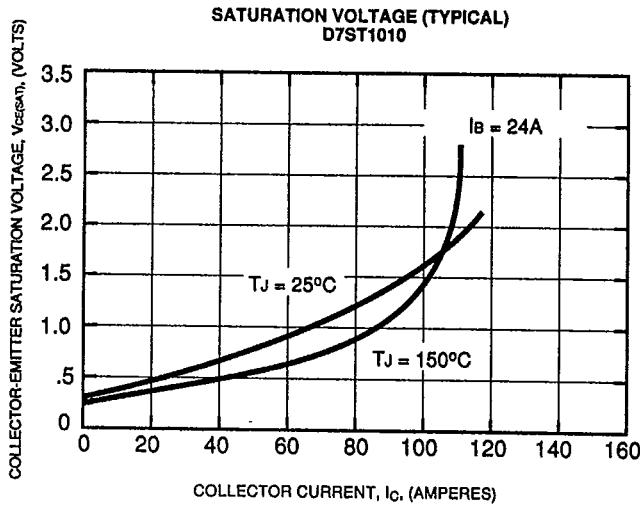
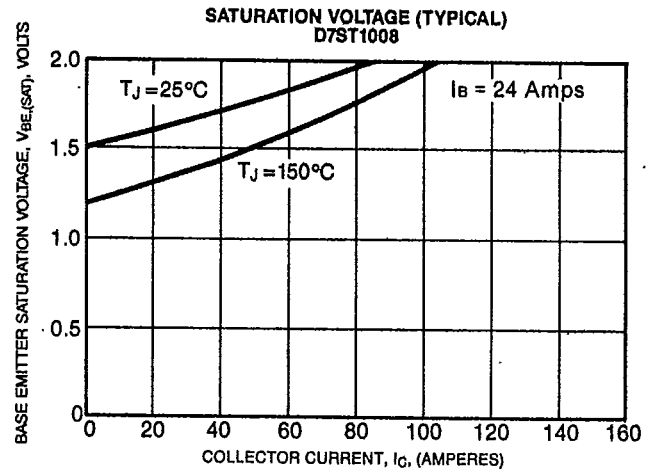
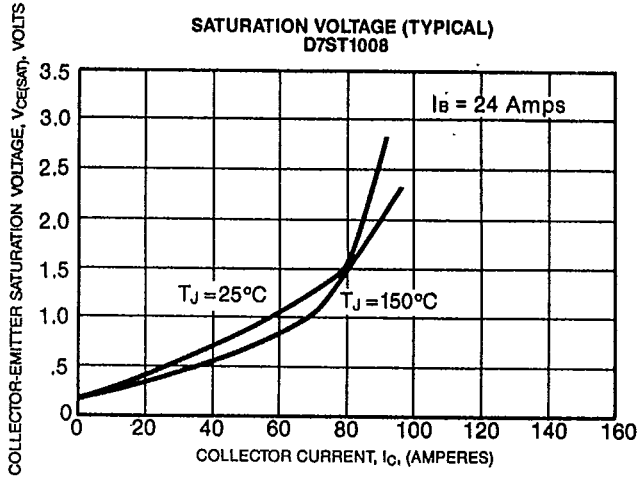
DC CURRENT GAIN (TYPICAL)
D7ST1012





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D7ST1008, D7ST1010, D7ST1012
 NPN Power Switching Transistors
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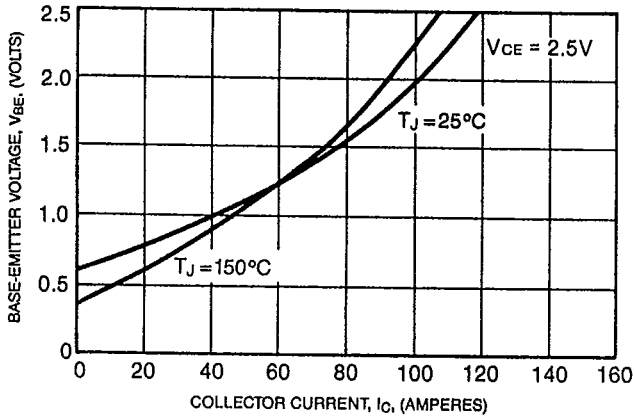




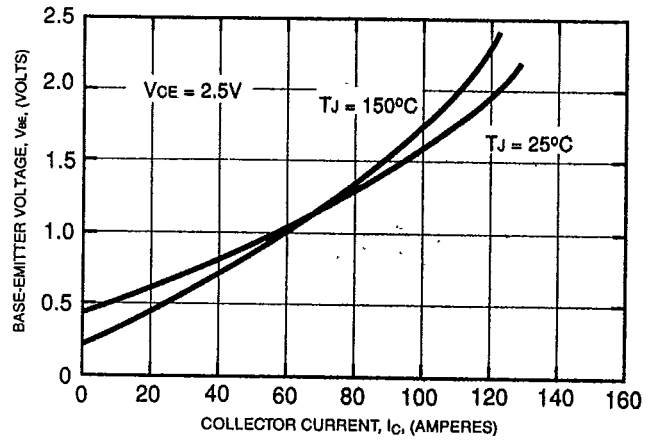
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D7ST1008, D7ST1010, D7ST1012
NPN Power Switching Transistors
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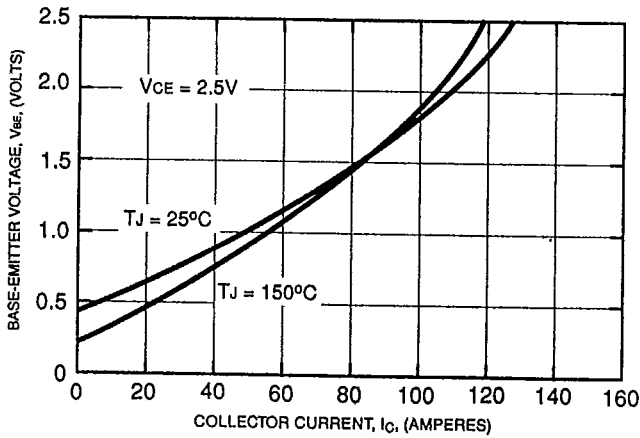
TRANSFER CHARACTERISTICS (TYPICAL)
D7ST1008



TRANSFER CHARACTERISTICS (TYPICAL)
D7ST1010



TRANSFER CHARACTERISTICS (TYPICAL)
D7ST1012

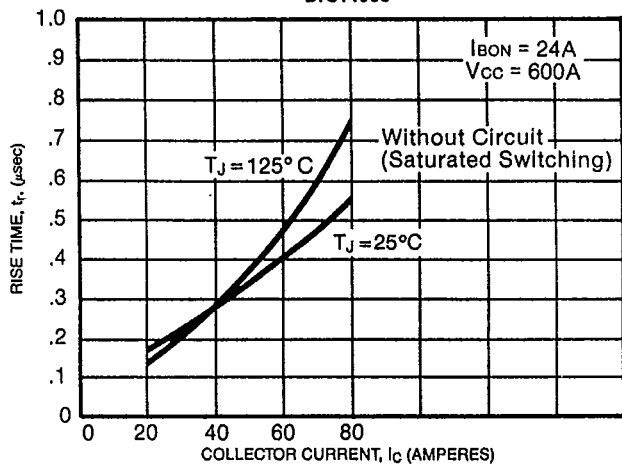




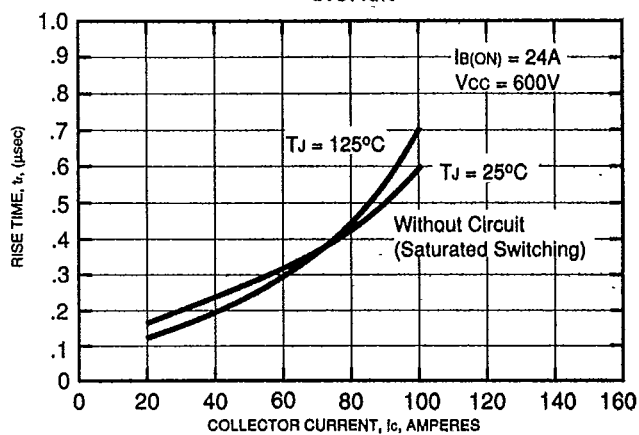
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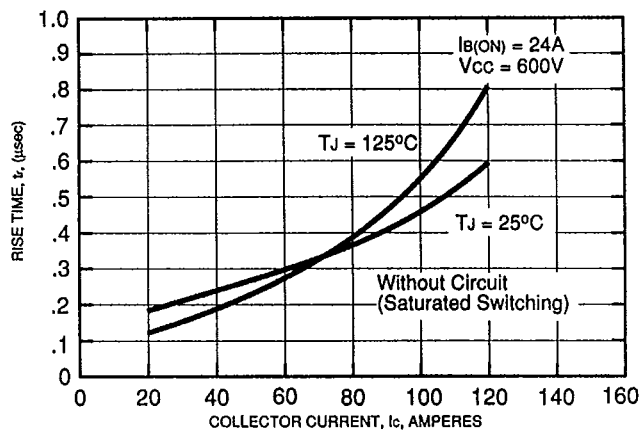
RESISTIVE SWITCHING (TYPICAL)
D7ST1008



RESISTIVE SWITCHING (TYPICAL)
D7ST1010



RESISTIVE SWITCHING (TYPICAL)
D7ST1012

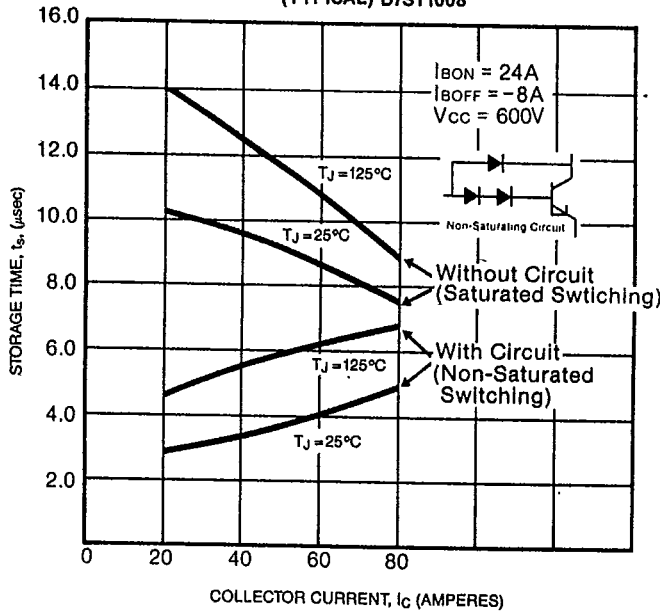




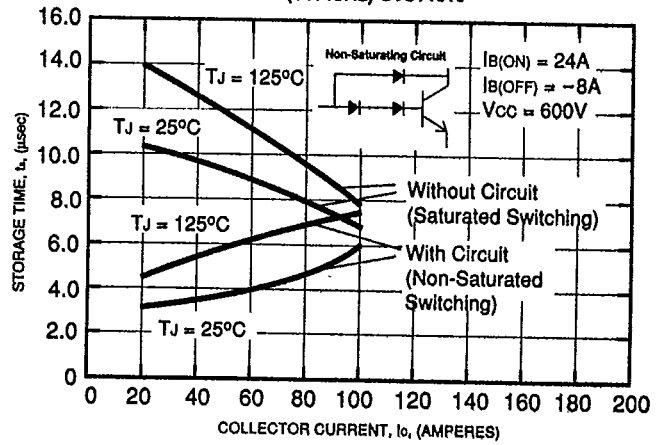
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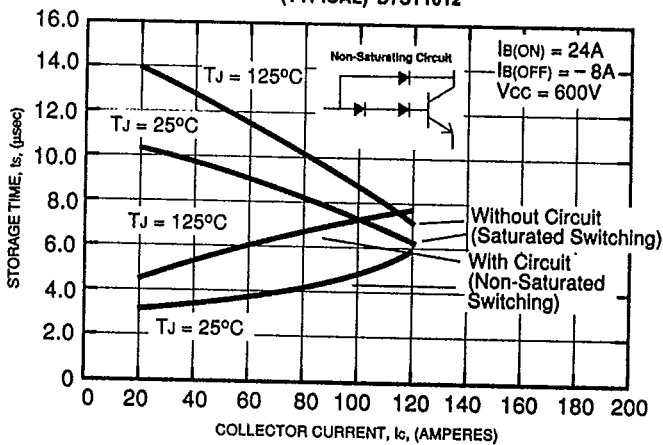
STORAGE TIME FOR CLAMPED INDUCTIVE SWITCHING
(TYPICAL) D7ST1008



STORAGE TIME FOR CLAMPED INDUCTIVE SWITCHING
(TYPICAL) D7ST1010



STORAGE TIME FOR CLAMPED INDUCTIVE SWITCHING
(TYPICAL) D7ST1012

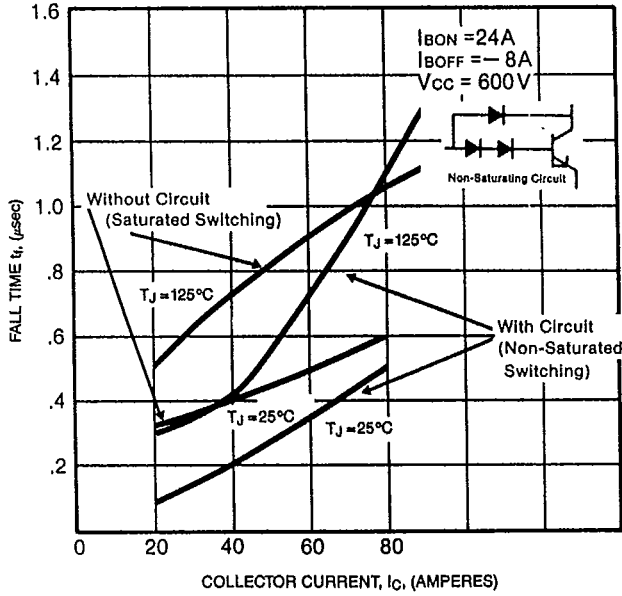




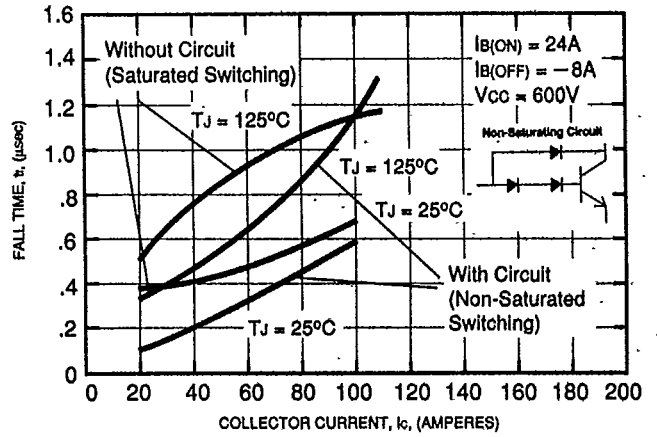
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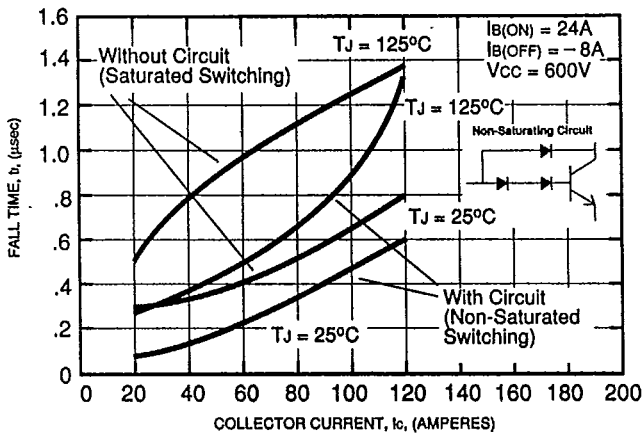
FALL TIME FOR CLAMPED INDUCTIVE SWITCHING
(TYPICAL) D7ST1008



FALL TIME FOR CLAMPED INDUCTIVE SWITCHING
(TYPICAL) D7ST1010



FALL TIME FOR CLAMPED INDUCTIVE SWITCHING
(TYPICAL) D7ST1012





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