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2N6922, 2N6922A
2N6923, 2N6923A
2N6926, 2N6926A
2N6927, 2N6927A

- **Off-line Power Supplies**
- **Inverters/Converters**
- **Switching Amplifiers**
- **Switching Regulators**

TO-204AA — 2N6922 (A), 23 (A)
TO-247 — 2N6926 (A), 27 (A)

***MAXIMUM RATINGS** (T_C = 25°C unless otherwise noted.)

SYMBOL	DESCRIPTION	2N6922/A	2N6923/A	2N6926/A	2N6927/A	UNIT
V_{CEV}	Collector-Emitter Voltage, Blocking	550/850	550/850	550/850	550/850	Volts
$V_{CEX(sus)}$	Collector-Emitter Voltage, Inductive Switching	450	500	450	500	Volts
$V_{CEO(sus)}$	Collector-Emitter Voltage, Sustaining	400	450	400	450	Volts
V_{EBO}	Emitter Base Voltage	8.0		8.0		Volts
I_C	Collector Current—Continuous/Peak	20/30		20/30		Amps
I_E	Emitter Current—Continuous/Peak	30/40		30/40		Amps
I_B	Base Current—Continuous/Peak	10/15		10/15		Amps
P_D	Total Power Dissipation @ T_C = 25°C	220		125		Watts
$T_{J(oper)}$ T_{stg}	Operating and Storage Junction Temperature Range	-65 to +200		-55 to +150		°C

***ELECTRICAL CHARACTERISTICS** (Applies to all types unless otherwise noted.)

			T_C = 25°C		T_C = 100°C		
SYMBOL	CONDITIONS	PART NO/NOTES	MIN.	MAX.	MIN.	MAX.	UNIT
OFF-STATE							
$V_{CEO(sus)}$	I_C = 50mA	2N6922, 6 (A) 2N6923, 7 (A)	400 450				Volts
I_{CEV}	V_{CE} = Rated V_{CEV}, V_{EB} = 1.5V			1.0			mA
I_{CEV}	V_{CE} = 0.8 Rated V_{CEV}, V_{EB} = 1.5V			10		100	μA
I_{EBO}	V_{EB} = 8.0V			1.0			mA
ON-STATE							
h_{FE}	I_C = 15A, V_{CE} = 2.0V	Pulsed: Notes 1 & 2	8.0				
$V_{CE(sat)}$	I_C = 15A, I_B = 3.0A			1.0		1.5	Volts
$V_{CE(sat)}$	I_C = 20A, I_B = 5.0A			2.0			Volts
$V_{CE(sat)}$	I_C = 30A, I_B = 10A	Pulsed: Notes 1 & 3		5.0			Volts
$V_{BE(sat)}$	I_C = 15A, I_B = 3.0A	Pulsed: Notes 1 & 2		1.5			Volts
DYNAMIC							
f_T	V_{CE} = 10V, I_C = 1.0A, f = 10MHz	Pulsed: Note 2	15	50			MHz
C_{obo}	V_{CB} = 10V, f = 1.0MHz		200	500			pF
t_d	I_C = 15A, I_{B1} = 3.0A, Resistive Load, V_{CC} = $V_{CEX(sus)}$			20			ns
t_r				50			ns
t_{sv} (t_c)	Current Source Load	Measured to 10V		1.0		3.0	μs
t_{sv}	Inductive Load, I_C = 15A, I_{B1} = 3.0A, I_{B2} = 6.0A, t_p = 30μsec, L = 100μH, V_{CLAMP} = $V_{CEX(sus)}$			1.0		1.5	μs
t_{rv}				30		40	ns
t_h				30		40	ns
t_c				50		70	ns
THERMAL							
$R_{\theta JC}$	V_{CE} = 10V, I_C = 10A	2N6922, 3 (A)		0.8			°C/W
$R_{\theta JC}$	V_{CE} = 10V, I_C = 5.0A	2N6926, 7 (A)		1.0			°C/W

Notes: 1) Measured using Kelvin connections.
2) Pulse measurement conditions: Length = 300μs, Duty cycle < 2%.
3) Pulse measurement conditions: Length = 10μs, Duty cycle < 2%.

*JEDEC registered data.

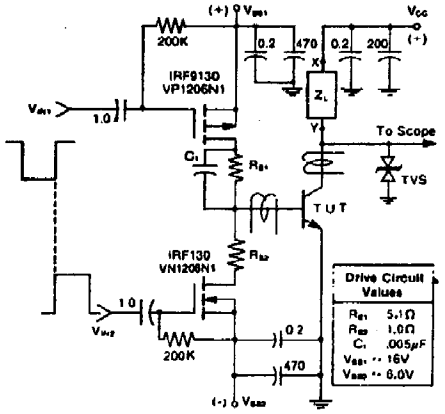

Figure 13—Switching Test Circuit

Load Circuit Values				
Test	$V_{CE(PK)}$	V_{CC}	Z_L	TVS
Resistive				
2N6922, 6	—	450V	30Ω	—
2N6923, 7	—	500V	33Ω	—
Inductive				
2N6922, 6	450V	50V	100μH	2 - SA160CA
2N6923, 7	500V	50V	100μH	2 - SA170CA
Dynamic Saturation	—	50V	Fig. 14	—

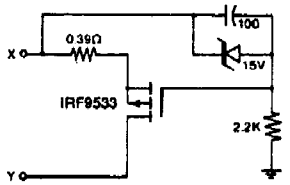

Figure 14—Current Source Load (Z_L)

Notes:

1. Capacitance values in μFd.
2. For inductive switching, the Transient Voltage Suppressor (TVS) diode is selected to allow $V_{CE(PK)}$ to equal rated $V_{CEX(sus)}$. Since some overshoot caused by circuit inductance and TVS heating is inevitable, the specified TVS breakdown voltage will be about 100 volts less than $V_{CEX(sus)}$. Correct voltage may be achieved by stacking TVS diodes and by making minor adjustments in the duty cycle.
3. For resistive switching, R_L is composed of a stack of 2W carbon resistors which may need to be trimmed to obtain the correct I_C. For inductive switching, $I_C \approx T_{ON} V_{CC}/L$. V_{CC} may need minor adjustment to obtain correct I_C. Duty cycle ≤ 1%.
4. Proper circuit performance is only achieved by a circuit layout which minimizes lead inductance. The emitter of the T.U.T. must be the ground focal point. To minimize stray coupling, a double sided heavy foil P.C.B. is suggested for the driver stage.
5. View the voltage across power supply lines and adjust bypassing so that ringing is a small percentage of signal levels. Sprague Extralytic® and metalized stacked film capacitors are used for supply bypassing.
6. Base current should be viewed with a current probe. C_1 is chosen to achieve an essentially flat topped current pulse. V_{BB1} and V_{BB2} are adjusted to obtain correct values for the base currents, I_{B1} and I_{B2}.
7. Ground loops through the scope and pulse generator must be avoided. A differential amplifier scope input is often the best solution when a ground loop is encountered.

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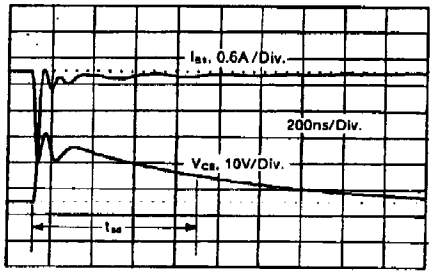

Figure 15—Dynamic Saturation Waveforms

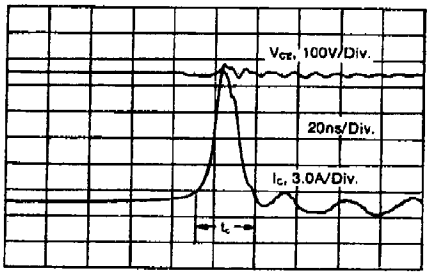

Figure 16—Crossover Waveforms

Digitized Waveforms