

Appendix B

Terms and Symbols

General

AQL	acceptance quality level	$E_{S/D}$	reverse-bias second-breakdown energy
CM	cross modulation	$f_{\alpha c}$	base (alpha) cutoff frequency
IMD	intermodulation distortion	$f_{\beta c}$	emitter (beta) cutoff frequency
K	post-radiation neutron-damage constant	h_{FE}	dc forward-current transfer ratio
LTPD	lot tolerance per cent defective	h_{fe}	common-emitter, small-signal, short-circuit, forward-current transfer ratio
MTBF	mean time between failures	$ h_{fe} $	magnitude of common-emitter, small-signal, short-circuit, forward-current transfer ratio
MTTF	mean time to failure	f_{hfe}	common-emitter, small-signal, short-circuit forward-current transfer ratio cutoff frequency
NF	noise factor (or noise figure)	f_r	gain-bandwidth product (unity-gain frequency for devices in which gain roll off has a -1 slope)
P_D	device dissipation	G_c	conversion gain
pps	pulses per second	G_{pb}	small-signal, common-base power gain
P_r	pulse repetition rate	G_{PB}	large-signal, common-base power gain
prt	pulse recurrence time	G_{pe}	small-signal, common-emitter power gain
PW	pulse width	G_{PE}	large-signal, common-emitter power gain
RMS	root mean square	G_{VE}	wide-band voltage gain
$R_{\theta JA}$	thermal resistance, junction-to-ambient	h_{ib}	common-base, small-signal, short-circuit input impedance
$R_{\theta JC}$	thermal resistance, junction-to-case	h_{ie}	common-emitter, small-signal, short-circuit input impedance
$R_{\theta JF}$	thermal resistance, junction-to-flange	h_{ob}	common-base, small-signal, open circuit output admittance
$R_{\theta JA}$	thermal resistance, junction-to-free air	h_{rb}	common-base, small-signal, open-circuit reverse-voltage transfer ratio
$R_{\theta HS}$	thermal resistance, junction-to-heat sink	I_B	continuous base current
T_A	ambient temperature	I_{BEV}	base-cutoff current with specified voltage between collector and emitter
T_C	case temperature	I_{BM}	peak base current
THD	total harmonic distortion	I_C	continuous collector current
T_J	operating (junction) temperature	I_{CBO}	collector-cutoff current, emitter open
T_L	lead temperature during soldering	I_{CEO}	collector-cutoff current, base open
t_p	pulse duration	I_{CER}	collector-cutoff current with specified resistance between base and emitter
T_{stg}	storage temperature	I_{CES}	collector-cutoff current with base-emitter junction short-circuited
η	efficiency		
θ	conduction angle		
ϕ	phase angle		
ϕ_L	lead radius (for bending)		
τ	torque		
τ_s	device stud torque		
Power Transistors			
(C)	collector-to-base charge-generation constant (during gamma exposure)		
$C_{b'c}$	feedback capacitance		
C_c	collector-to-case capacitance		
C_{cb}	collector-to-base feedback capacitance		
C_{ib}	common-base input capacitance		
C_{ob}	common-base output capacitance		
C_{obo}	open-circuit common-base output capacitance		

Terms and Symbols (Cont'd)

Power Transistors (Cont'd)

I_{CEV}	collector-cutoff current with specified voltage between base and emitter	$V_{(BR)CEX}$	collector-to-emitter breakdown voltage with specified circuit between base and emitter
I_{CEX}	collector-cutoff current with specified circuit between base and emitter	$V_{(BR)EBO}$	emitter-to-base breakdown voltage, collector open
I_{CM}	peak collector current	V_{CB}	collector-to-base voltage
$I_C(\text{sat})$	collector current at which h_{FE} , $V_{BE}(\text{sat})$, $V_{CE}(\text{sat})$, and switching speeds are measured	V_{CBO}	collector-to-base voltage, emitter open
I_E	continuous emitter current	V_{CC}	collector supply voltage
I_{EBO}	emitter-cutoff current, collector open	V_{CE}	collector-to-emitter voltage
I_{EM}	peak emitter current	V_{CEO}	collector-to-emitter voltage, base open
$I_{S/b}$	forward-bias, second-breakdown collector current	$V_{CE}(\text{sat})$	collector-to-emitter saturation voltage
P_G	power gain	$V_{CEO}(\text{sus})$	collector-to-emitter sustaining voltage, base open
PRT	power rating test	V_{CER}	collector-to-emitter voltage with specified resistance between base and emitter
P_T	transistor dissipation at specified temperature	$V_{CER}(\text{sus})$	collector-to-emitter sustaining voltage with specified resistance between base and emitter
$r_{bb'}$	base spreading resistance	V_{CES}	collector-to-emitter voltage with base-emitter junction short-circuited
R_{BB}	base bias resistor	V_{CEV}	collector-to-emitter voltage with specified voltage between base and emitter
$r_b' C_c$	collector-to-base time constant	$V_{CEV}(\text{sus})$	collector-to-emitter sustaining voltage with specified voltage between base and emitter
R_{BE}	external base-to-emitter resistance	V_{CEX}	collector-to-emitter voltage with specified circuit between base and emitter
R_C	collector resistor	$V_{CEX}(\text{sus})$	collector-to-emitter sustaining voltage with specified circuit between base and emitter
$r_{CE}(\text{sat})$	dc collector-to-emitter saturation resistance	V_{EB}	emitter-to-base voltage
$R_e (h_{ie})$	real part of common-emitter, small-signal, short-circuit input impedance	V_{EBO}	emitter-to-base voltage, collector open
R_o	collector-to-emitter saturation resistance	V_F	diode forward-voltage drop
t_c	clamped turn-off switching time of an inductive load	V_{RT}	collector-to-emitter reach through (or punch through) voltage
t_d	delay time	α	common-base current gain (alpha)
t_f	fall time	β	collector-emitter current gain (beta)
t_{OFF}	turn-off time (storage time + fall time)	η_C	collector efficiency
t_{ON}	turn-on time (delay time + rise time)	τ_1	thermal time constant
t_r	rise time		
t_s	storage time		
T_{VI}	clamped inductive turn-off time		
V_{BB}	base supply voltage		
V_{BE}	base-to-emitter voltage		
$V_{BE}(\text{sat})$	base-to-emitter saturation voltage		
$V_{(BR)CBO}$	collector-to-base breakdown voltage, emitter open		
$V_{(BR)CEO}$	collector-to-emitter breakdown voltage, base open		
$V_{(BR)CEV}$	collector-to-emitter breakdown voltage with specified voltage between base and emitter		