www.omseni.com

OM SENI

MJD47T4G, MJD50T4G High Voltage Power Transistors

DPAK for Surface Mount Applications

Designed for line operated audio output amplifier, switchmode supply drivers and other switching applications.

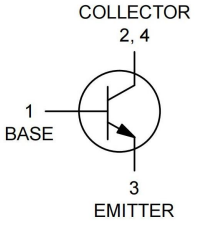
Features

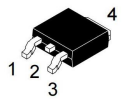
- Lead Formed for Surface Mount Applications in Plastic Sleeves (No Suffix)
- Electrically Similar to Popular TIP47, and TIP50
- Epoxy Meets UL 94 V−0 @ 0.125 in
- These Devices are Pb−Free and are RoHS Compliant

MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Collector−Emitter Voltage MJD47T4G MJD50T4G	V_{CEO}	 250 400	Vdc
Collector−Base Voltage MJD47T4G MJD50T4G	V_{CB}	 350 500	Vdc
Emitter−Base Voltage	V_{EB}	5	Vdc
Collector Current − Continuous	I_C	1	Adc
Collector Current − Peak	I_{CM}	2	Adc
Base Current	I_B	0.6	Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	 15 0.12	 W W/°C
Total Power Dissipation (Note 1) @ T_A = 25°C Derate above 25°C	P_D	 1.56 0.0125	 W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150	°C
ESD − Human Body Model	HBM	3B	V
ESD − Machine Model	MM	C	V

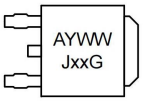
NPN SILICON POWER TRANSISTORS
1 AMPERE
250, 400 VOLTS, 15 WATTS





DPAK
CASE 369C
STYLE 1

MARKING DIAGRAM



A = Assembly Location
Y = Year
WW = Work Week
Jxx = Device Code
xx = 47 or 50
G = Pb−Free Package

OM SENI

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction−to−Case	$R_{\theta JC}$	8.33	°C/W
Thermal Resistance Junction−to−Ambient (Note 2)	$R_{\theta JA}$	80	°C/W
Lead Temperature for Soldering Purpose	T_L	260	°C

2. These ratings are applicable when surface mounted on the minimum pad sizes recommended.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector−Emitter Sustaining Voltage (Note 3) (I_C = 30 mAdc, I_B = 0) MJD47, NJVMJD47T4G MJD50, NJVMJD50T4G	$V_{CEO(sus)}$	 250 400	 − −	Vdc
Collector Cutoff Current (V_{CE} = 150 Vdc, I_B = 0) MJD47, NJVMJD47T4G (V_{CE} = 300 Vdc, I_B = 0) MJD50, NJVMJD50T4G	I_{CEO}	 − −	 0.2 0.2	mAdc
Collector Cutoff Current (V_{CE} = 350 Vdc, V_{BE} = 0) MJD47, NJVMJD47T4G (V_{CE} = 500 Vdc, V_{BE} = 0) MJD50, NJVMJD50T4G	I_{CES}	 − −	 0.1 0.1	mAdc
Emitter Cutoff Current (V_{BE} = 5 Vdc, I_C = 0)	I_{EBO}	 −	 1	mAdc
ON CHARACTERISTICS (Note 3)				
DC Current Gain (I_C = 0.3 Adc, V_{CE} = 10 Vdc) (I_C = 1 Adc, V_{CE} = 10 Vdc)	h_{FE}	 30 10	 150 −	−
Collector−Emitter Saturation Voltage (I_C = 1 Adc, I_B = 0.2 Adc)	$V_{CE(sat)}$	 −	 1	Vdc
Base−Emitter On Voltage (I_C = 1 Adc, V_{CE} = 10 Vdc)	$V_{BE(on)}$	 −	 1.5	Vdc
DYNAMIC CHARACTERISTICS				
Current Gain − Bandwidth Product (I_C = 0.2 Adc, V_{CE} = 10 Vdc, f = 2 MHz)	f_T	 10	 −	MHz
Small−Signal Current Gain (I_C = 0.2 Adc, V_{CE} = 10 Vdc, f = 1 kHz)	h_{fe}	 25	 −	−

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

OM SENI

TYPICAL CHARACTERISTICS

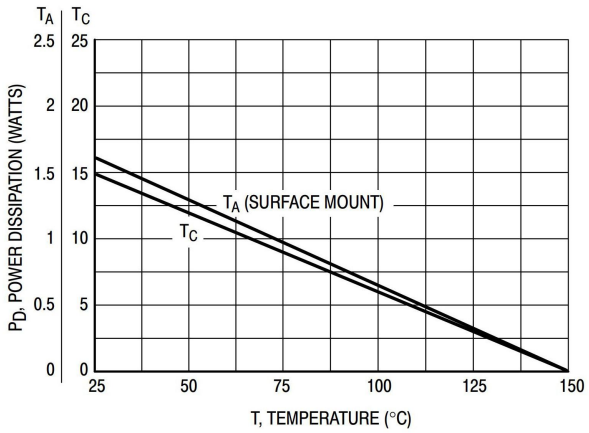


Figure 1. Power Derating

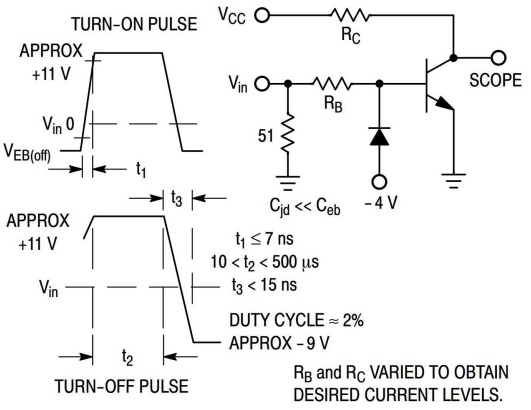


Figure 2. Switching Time Equivalent Circuit

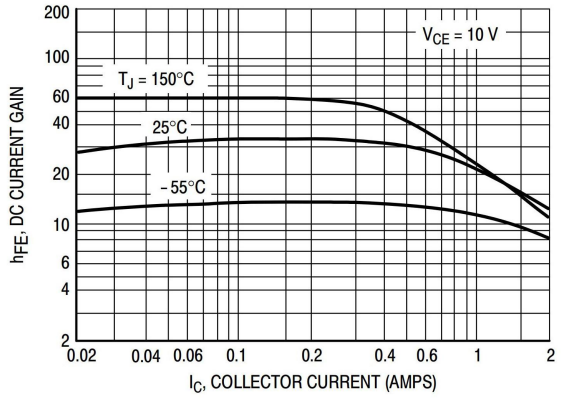


Figure 3. DC Current Gain

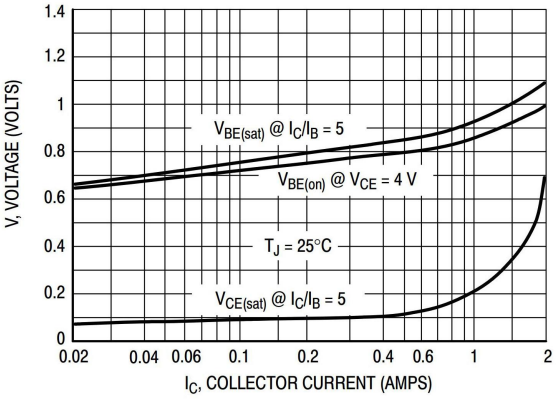


Figure 4. "On" Voltages

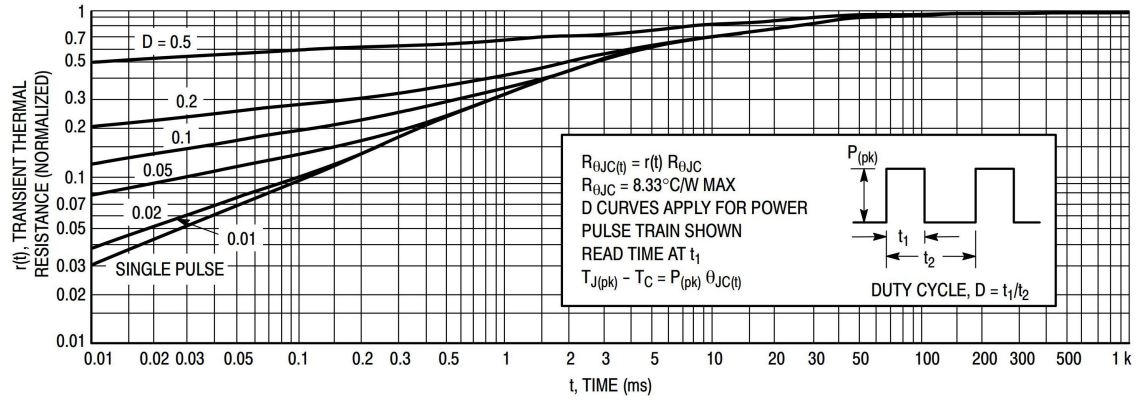


Figure 5. Thermal Response

OM SENI

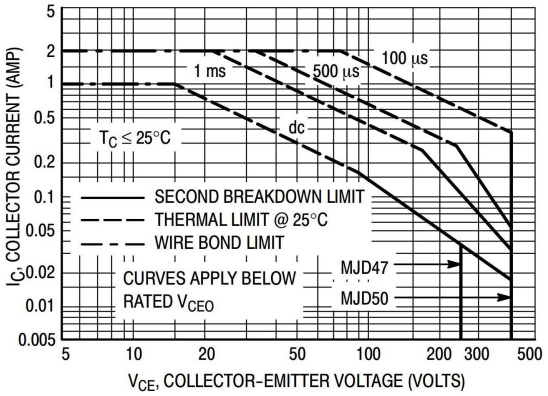


Figure 6. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 6 is based on $T_{J(pk)} = 150°C$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$. $T_{J(pk)}$ may be calculated from the data in Figure 5. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

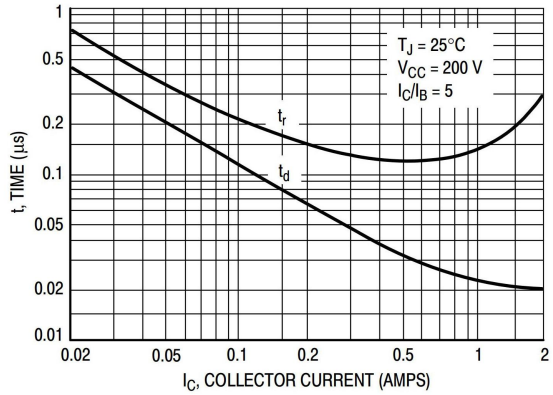


Figure 7. Turn−On Time

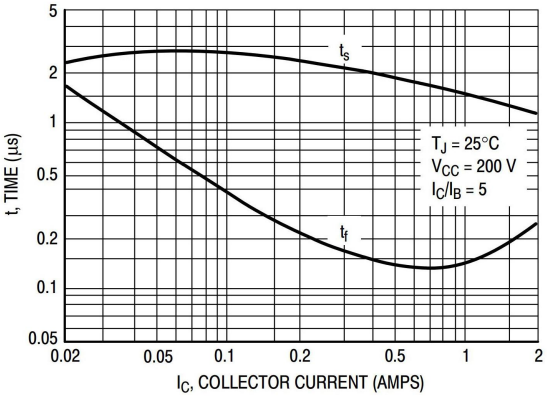


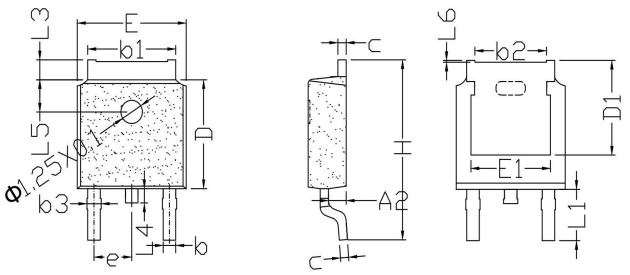
Figure 8. Turn-Off Time

OM SENI

Ordering Information

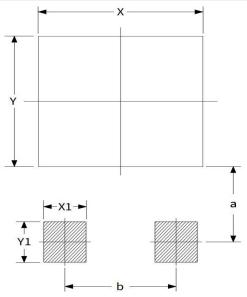
PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
TO-252	R3	0.305	2500	5000	25000	13''

Package Outline Dimensions (TO-252)



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A2	0.90	1.10	0.035	0.043
b	0.66	0.86	0.026	0.034
b1	5.10	5.46	0.201	0.215
b2	4.27	4.37	0.168	0.172
b3	0.78	0.90	0.031	0.035
c	0.45	0.55	0.018	0.022
D	5.90	6.30	0.232	0.248
D1	5.35 REF.		0.211REF.	
E	6.30	6.70	0.248	0.264
E1	4.83 REF.		0.190 REF.	
e	2.18	2.38	0.086	0.094
H	9.80	10.4	0.386	0.409
L1	2.70	3.10	0.106	0.122
L3	0.80	1.20	0.031	0.047
L4	0.60	1.00	0.024	0.039
L5	1.8 REF.		0.071 REF.	
L6	-	0.12	-	0.005

Suggested Pad Layout



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
a	3.70	-	0.146	-
b	4.37	-	0.172	-
X	-	5.80	-	0.228
X1	-	1.20	-	0.047
Y	-	5.85	-	0.230
Y1	-	2.00	-	0.079