M63824GP/KP

7-UNIT 500mA DARLINGTON TRANSISTOR-ARRAY WITH CLAMP DIODE

DESCRIPTION

The M63824GP/KP 7-channel sinkdriver, consists of 14 NPN transistors connected to from seven high current gain driver pairs.

FEATURES

- High breakdown voltage ($BV_{CEO} \geq 50V$)
- High-current driving ($I_{C(max)} = 500mA$)
- With clamping diodes
- 3V micro computer series compatible input
- Wide operating temperature range (Ta = –40 to +85°C)

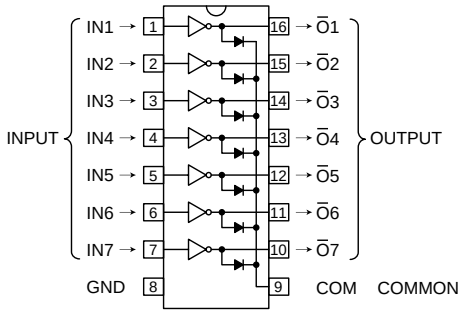
APPLICATION

Output for 3 voltage microcomputer series and interface with high voltage system. Relay and small printer driver, LED, or incandescent display digit driver.

FUNCTION

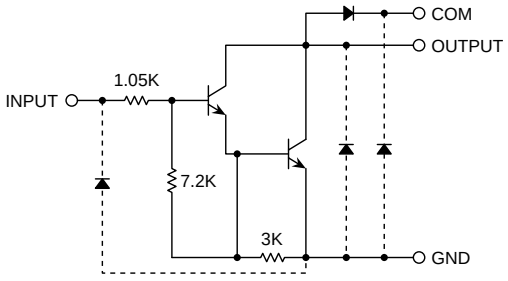
The M63824GP/KP is transistor-array of high active level seven units type which can do direct drive of 3 voltage micro-computer series. A resistor of 1.05kΩ is connected between the input pin. A clamp diode for inductive load transient suppression is connected for the output pin (collector) and COM pin (pin9). All emitters of the output transistor are connected to GND (pin8). The outputs are capable of driving 500mA and are rated for operation with output voltage up to 50V.

PIN CONFIGURATION



Package type 16P2S-A(GP)
16P2Z-A(KP)

CIRCUIT DIAGRAM



The seven circuits share the COM and GND

The diode, indicated with the dotted line, is parasitic, and cannot be used.

Unit : Ω

ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, Ta = –40 ~ +85°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CEO}	Collector-emitter voltage	Output, H	–0.5 ~ +50	V
I_C	Collector current	Current per circuit output, L	500	mA
V_I	Input voltage		–0.5 ~ +10	V
I_F	Clamping diode forward current		500	mA
V_R	Clamping diode reverse voltage		50	V
P_d	Power dissipation	Ta = 25°C, when mounted on board	0.80(GP)/0.6(KP)	W
T_{opr}	Operating temperature		–40 ~ +85	°C
T_{stg}	Storage temperature		–55 ~ +125	°C

MITSUBISHI ELECTRIC

RECOMMENDED OPERATING CONDITIONS (Unless otherwise noted, Ta = –40 ~ +85°C)

Symbol	Parameter	Conditions	Limits			Unit
			min	typ	max	
V_O	Output voltage		0	—	50	V
I_C	Collector current (Current per 1 circuit when 7 circuits are coming on simultaneously)	Duty Cycle GP : no more than 4% KP : no more than 3%	0	—	400	mA
		Duty Cycle GP : no more than 15% KP : no more than 12%	0	—	200	
V_{IH}	"H" input voltage	$I_C \leq 400mA$	2.4	—	10	V
V_{IL}	"L" input voltage		0	—	0.4	V

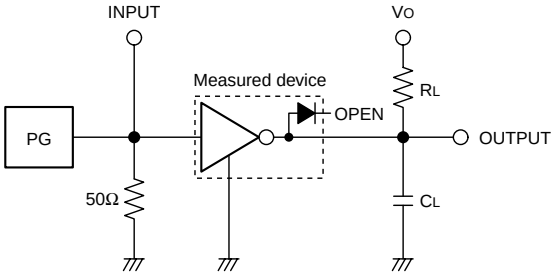
ELECTRICAL CHARACTERISTICS (Unless otherwise noted, Ta = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_{CEO} = 100μA	50	—	—	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_I = 500μA, I_C = 350mA	—	1.2	1.6	V
		I_I = 350μA, I_C = 200mA	—	1.0	1.3	
		I_I = 250μA, I_C = 100mA	—	0.9	1.1	
I_I	Input current	V_I = 3V	—	1.5	2.4	mA
V_F	Clamping diode forward volltage	I_F = 350mA	—	1.4	2.0	V
I_R	Clamping diode reverse current	V_R = 50V	—	—	100	μA
h_{FE}	DC amplification factor	V_{CE} = 2V, I_C = 350mA	1000	2500	—	—

SWITCHING CHARACTERISTICS (Unless otherwise noted, Ta = 25°C)

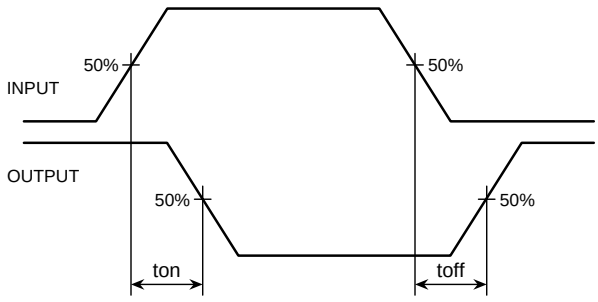
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t_{on}	Turn-on time	C_L = 15pF (note 1)	—	15	—	ns
t_{off}	Turn-off time		—	350	—	ns

NOTE 1 TEST CIRCUIT



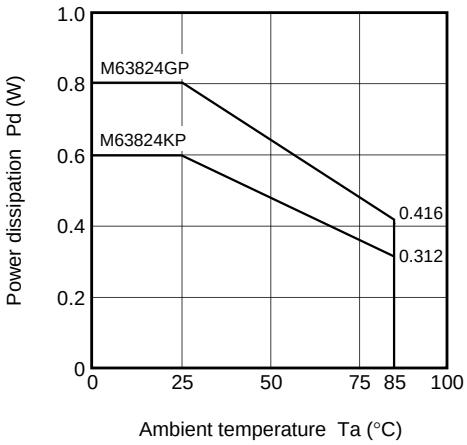
(1)Pulse generator (PG) characteristics : PRR=1kHz,
tw = 10μs, tr = 6ns, tf = 6ns, Zo = 50Ω
V_I = 0 ~ 3V
(2)Input-output conditions : R_L = 25Ω, Vo = 10V
(3)Electrostatic capacity C_L includes floating capacitance at connections and input capacitance at probes

TIMING DIAGRAM

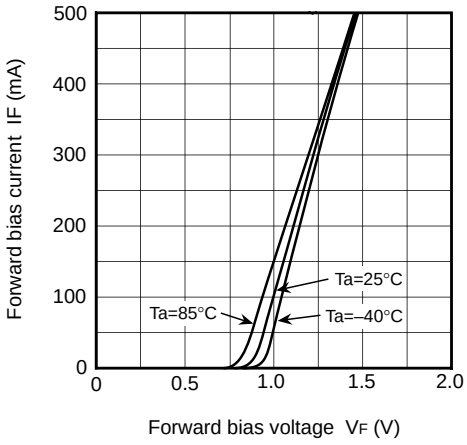


TYPICAL CHARACTERISTICS

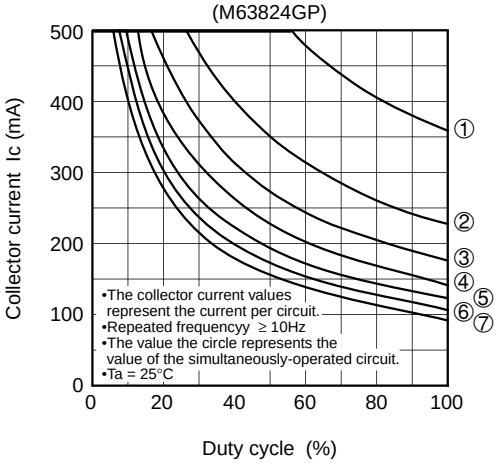
Thermal Derating Factor Characteristics



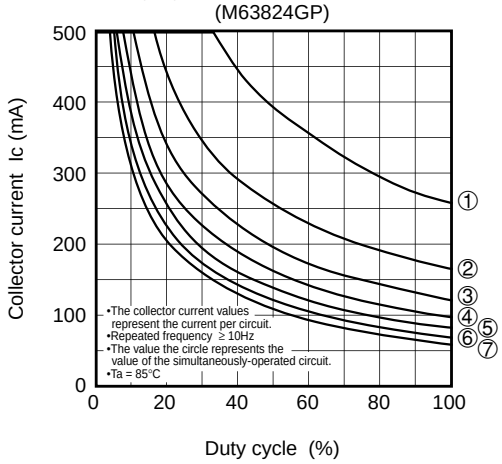
Clamping Diode Characteristics



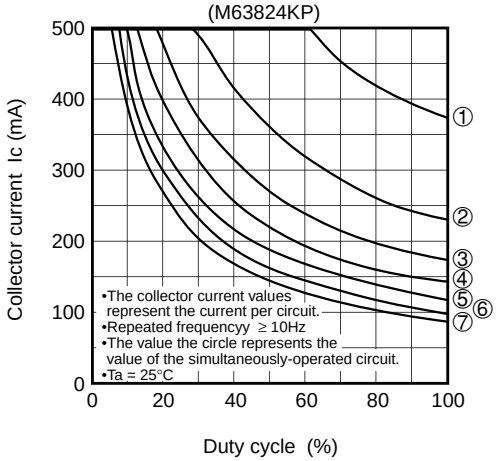
Duty Cycle-Collector Characteristics (M63824GP)



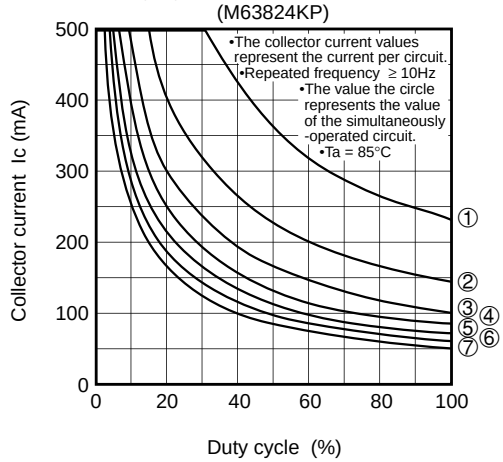
Duty Cycle-Collector Characteristics (M63824GP)



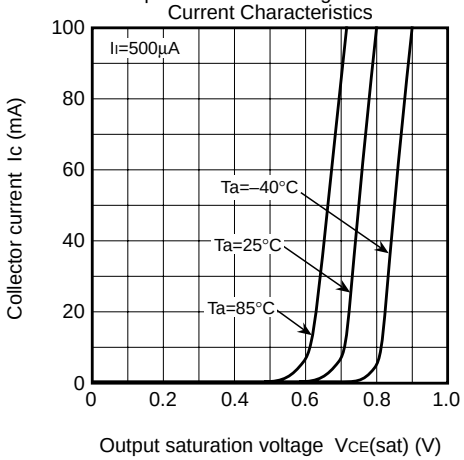
Duty Cycle-Collector Characteristics (M63824KP)



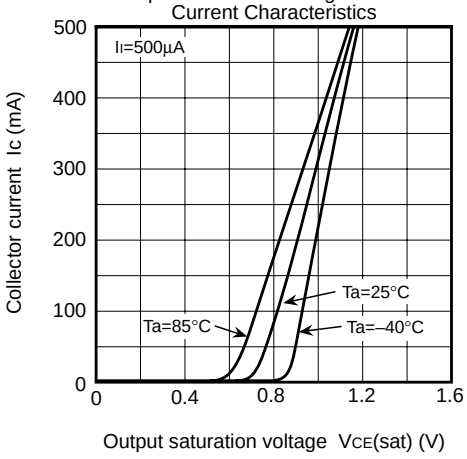
Duty Cycle-Collector Characteristics (M63824KP)



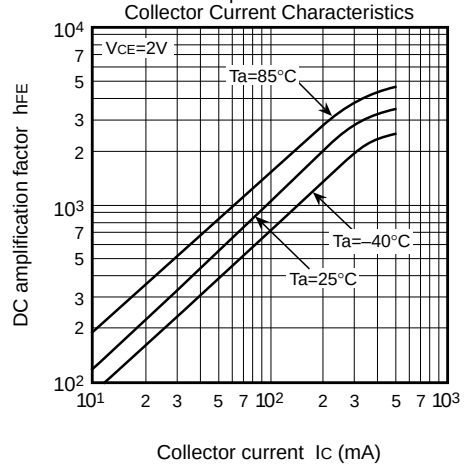
Output Saturation Voltage-Collector Current Characteristics



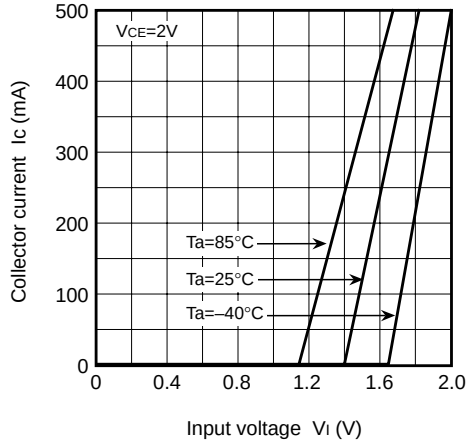
Output Saturation Voltage-Collector Current Characteristics



DC Amplification Factor Collector Current Characteristics



Grounded Emitter Transfer Characteristics



Input Characteristics