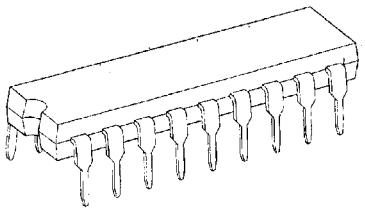
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62783AP,TD62783F,TD62783AF
TD62784AP,TD62784F,TD62784AF

8CH HIGH−VOLTAGE SOURCE DRIVER

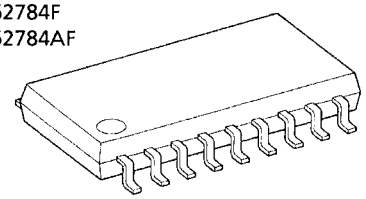
The TD62783AP / F / AF Series are comprised of eight source current Transistor Array.
These drivers are specifically designed for fluorescent display applications.
Applications include relay, hammer and lamp drivers.

TD62783AP
TD62784AP



DIP18-P-300-2.54D

TD62783F
TD62783AF
TD62784F
TD62784AF



SOP18-P-375-1.27

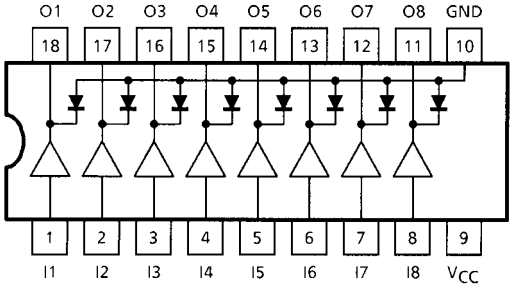
Weight
DIP18−P−300−2.54D : 1.47 g (Typ.)
SOP18−P−375−1.27 : 0.41 g (Typ.)

FEATURES

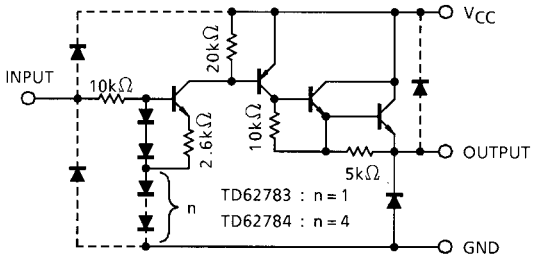
- High output voltage Type−AP, AF : V_{CC} = 50 V MIN.
  Type−F : V_{CC} = 35 V MIN.
- Output current (single output) I_{OUT} = −500 mA MIN.
- Output clamp diodes
- Single supply voltage
- Input compatible with various types of logic
- Package Type−AP : DIP−18 pin
- Package Type−F, AF : SOP−18 pin

TYPE	DESIGNATION
TD62783AP / F / AF	TTL, 5 V CMOS
TD62784AP / F / AF	6~15 V PMOS, CMOS

PIN CONNECTION (TOP VIEW)



SCHEMATICS (EACH DRIVER)



Note: The input and output parasitic diodes cannot be used as clamp diodes.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage	AP, AF	V_{CC}	50	V
	F		35	
Output Current		I_{OUT}	−500	mA / ch
Input Voltage		V_{IN} (Note 1)	15	V
		V_{IN} (Note 2)	30	
Clamp Diode Reverse Voltage	AP, AF	V_R	50	V
	F		35	
Clamp Diode Forward Current		I_F	500	mA
Power Dissipation	AP	P_D (Note 3)	1.47	W
	F, AF		0.96	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−55~150	°C

Note 1: Only TD62783AP / F / AF
Note 2: Only TD62784AP / F / AF
Note 3: Delated above 25°C in the proportion of 11.7 W / °C (AP Type), 7.7 W / °C (F, AF Type)

RECOMMENDED OPERATING CONDITIONS (Ta = −40~85°C)

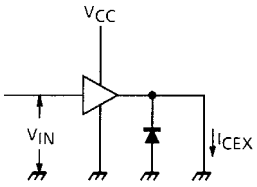
CHARACTERISTIC			SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Supply Voltage		AP, AF	V_{CC}	—		—	—	50	V
		F		—		—	—	35	
Output Current			I_{OUT}	Ta = 85°C T_j = 120°C T_{pw} = 25ms	Duty = 10% 8Circuits	—	—	−260	mA / ch
					Duty = 50% 8Circuits	—	—	−59	
					Duty = 10% 8Circuits	—	—	−180	
		AF, F			Duty = 50% 8Circuits	—	—	−38	
Input Voltage		TD62783AP / F / AF	V_{IN}	—		—	—	12	V
		TD62784AP / F / AF		—		—	—	24	
Input Voltage	Output On	TD62783AP / F / AF	$V_{IN\ (ON)}$	—		2.0	5.0	15	V
		TD62784AP / F / AF		—		4.5	12.0	30	
	Output Off	TD62783AP / F / AF	$V_{IN\ (OFF)}$	—		0	—	0.8	
		TD62784AP / F / AF		—		0	—	2.0	
Clamp Diode Reverse Voltage		AP	V_R	—		—	—	50	V
		F, AF		—		—	—	35	
Clamp Diode Forward Current			I_F	—		—	—	400	mA
Power Dissipation		AP	P_D	—		—	—	0.52	W
		F, AF		—		—	—	0.35	

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

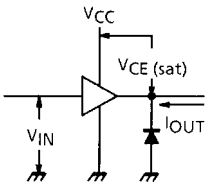
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current		I_{CEX}	1	V_{CC} = $V_{CC\ MAX.}$ V_{IN} = 0.4 V Ta = 25°C	—	—	100	μA
Output Saturation Voltage		$V_{CE\ (sat)}$	2	V_{IN} = $V_{IN\ (ON)}$, I_{OUT} = −350 mA	—	—	2.0	V
				V_{IN} = $V_{IN\ (ON)}$, I_{OUT} = −225 mA	—	—	1.9	
				V_{IN} = $V_{IN\ (ON)}$, I_{OUT} = −100 mA	—	—	1.8	
Input Current	TD62783AP / F / AF	$I_{IN\ (ON)}$	3	V_{IN} = 2.4 V	—	36	52	μA
				V_{IN} = 3.85 V	—	180	260	
	TD62784AP / F / AF			V_{IN} = 5 V	—	92	130	
				V_{IN} = 12 V	—	790	1130	
Input Voltage	TD62783AP / F / AF	$V_{IN\ (ON)}$	4	V_{CE} = 2.0 V	—	—	2.0	V
	TD62784AP / F / AF			I_{OUT} = −350 mA	—	—	4.5	
	TD62783AP / F / AF	$V_{IN\ (OFF)}$		I_{OUT} = −500 μA	0.8	—	—	
	TD62784AP / F / AF				2.0	—	—	
Supply Current		$I_{CC\ (ON)}$	3	V_{IN} = $V_{IN\ (ON)}$, V_{CC} = 50 V	—	—	2.5	mA / ch
Clamp Diode Reverse Current	AP, AF	I_R	5	V_R = 50 V	—	—	50	μA
	F			V_R = 35 V	—	—	50	
Clamp Diode Forward Voltage		V_F	6	I_F = 350 mA	—	—	2.0	V
Turn−On Delay		t_{ON}	7	V_{CC} = $V_{CC\ MAX.}$ R_L = 125 Ω C_L = 15 pF, R_L = 88 Ω (F)	—	0.15	—	μs
Turn−Off Delay		t_{OFF}			—	1.8	—	

TEST CIRCUIT

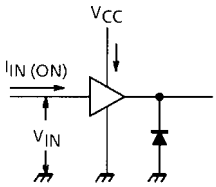
1. I_{CEX}



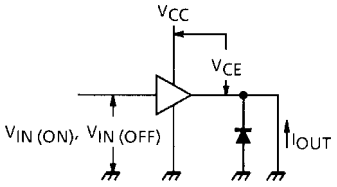
2. $V_{CE\ (sat)}$



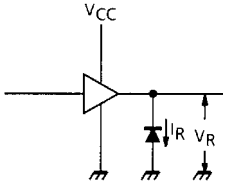
3. $I_{IN\ (ON)}$, I_{CC}



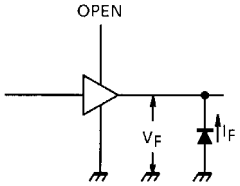
4. $V_{IN\ (ON)}$, $V_{IN\ (OFF)}$



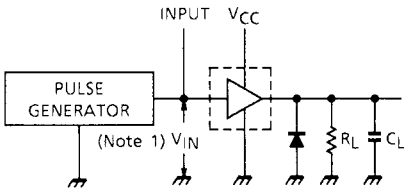
5. I_R

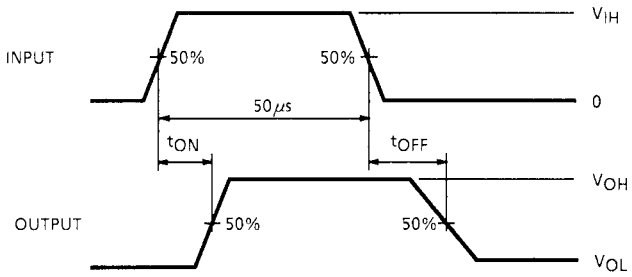


6. V_F



7. t_{ON}, t_{OFF}

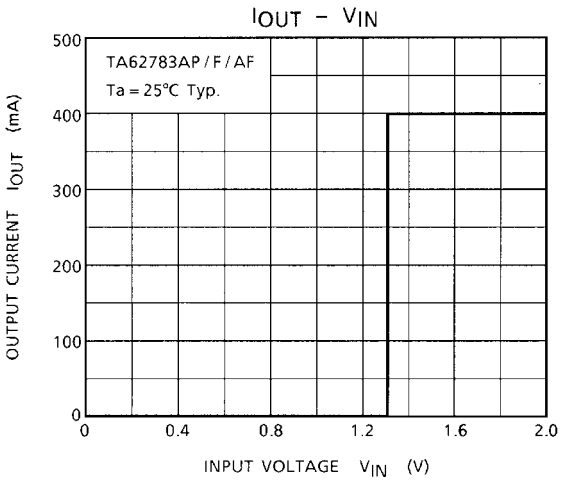


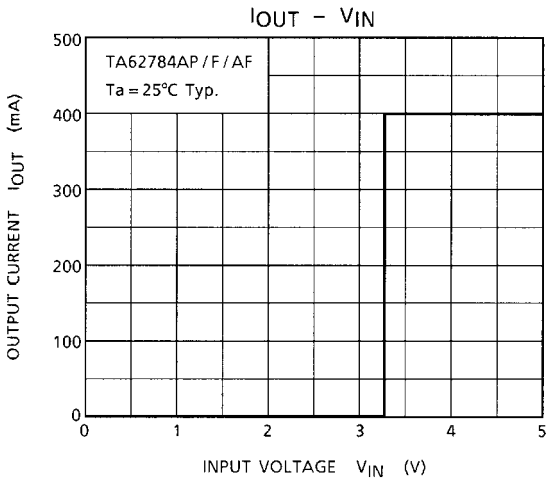


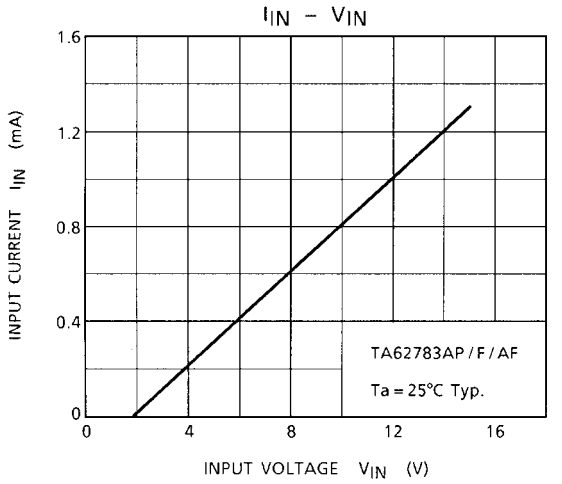
Note 1: Pulse width 50 μs, duty cycle 10%
Output impedance 50 Ω, $t_r \leq 5$ ns, $t_f \leq 10$ ns
Note 2: C_L includes probe and jig capacitance

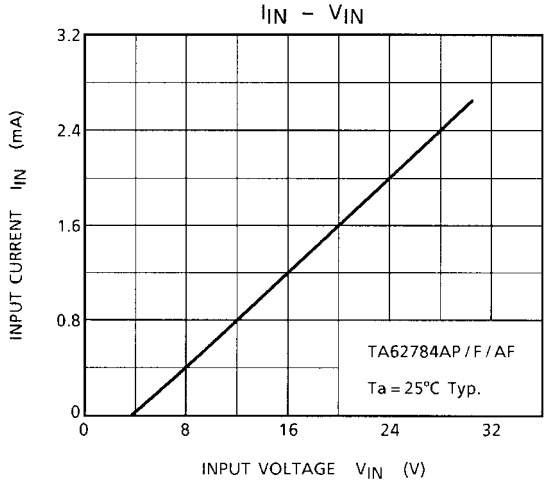
PRECAUTIONS for USING

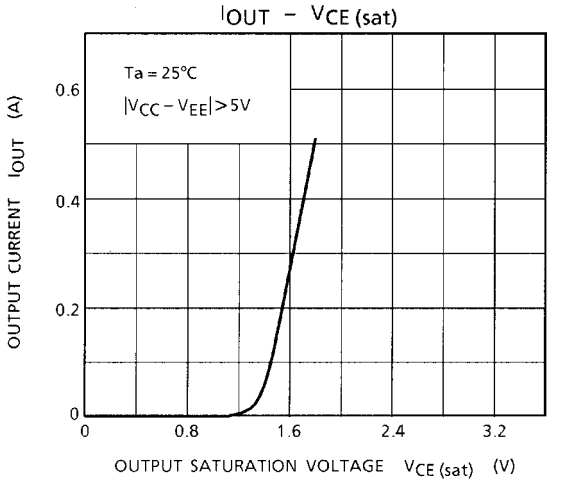
This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.
Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.
Utmost care is necessary in the design of the output line, V_{CC} and GND line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding.

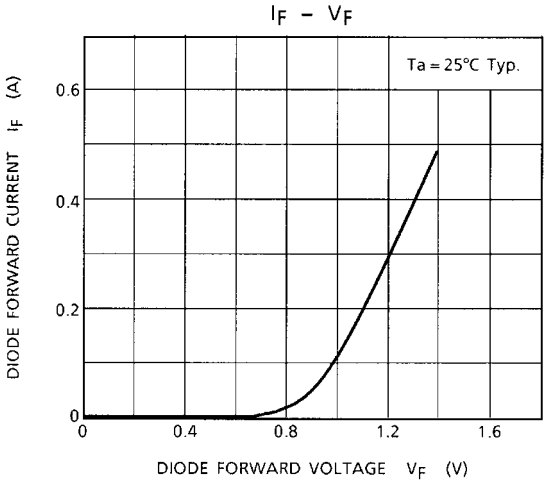

I_{OUT} – V_{IN}
TA62783AP / F / AF
Ta = 25°C Typ.
OUTPUT CURRENT I_{OUT} (mA)
500
400
300
200
100
0
0
0.4
0.8
1.2
1.6
2.0
INPUT VOLTAGE V_{IN} (V)

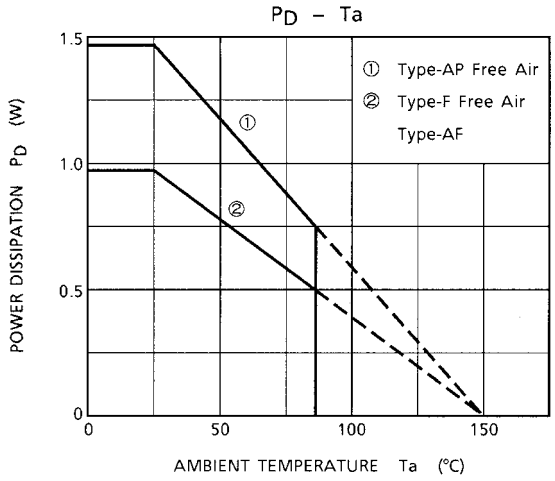

I_{OUT} – V_{IN}
TA62784AP / F / AF
Ta = 25°C Typ.
OUTPUT CURRENT I_{OUT} (mA)
500
400
300
200
100
0
0
1
2
3
4
5
INPUT VOLTAGE V_{IN} (V)


I_{IN} – V_{IN}
INPUT CURRENT I_{IN} (mA)
1.6
1.2
0.8
0.4
0
0
4
8
12
16
TA62783AP / F / AF
Ta = 25°C Typ.
INPUT VOLTAGE V_{IN} (V)


I_{IN} – V_{IN}
INPUT CURRENT I_{IN} (mA)
3.2
2.4
1.6
0.8
0
0
8
16
24
32
TA62784AP / F / AF
Ta = 25°C Typ.
INPUT VOLTAGE V_{IN} (V)

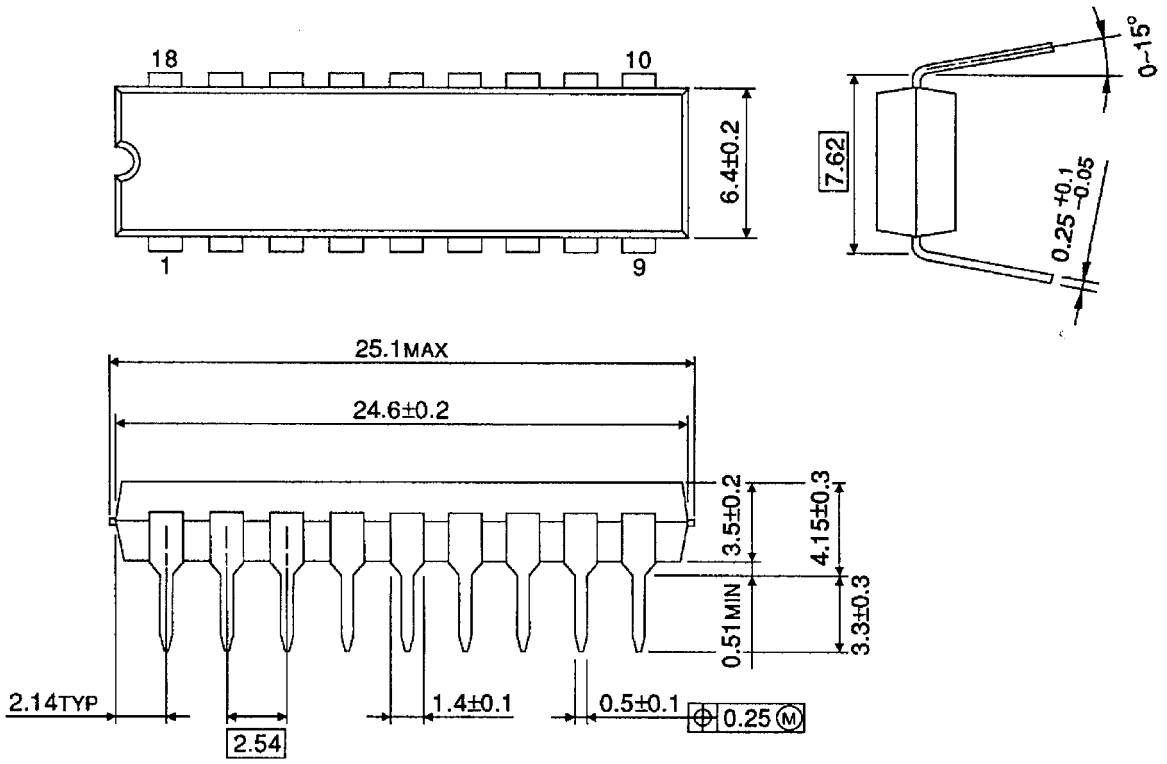

I_{OUT} – $V_{CE\,(sat)}$
Ta = 25°C
$|V_{CC} - V_{EE}| > 5V$
OUTPUT CURRENT I_{OUT} (A)
0.6
0.4
0.2
0
0
0.8
1.6
2.4
3.2
OUTPUT SATURATION VOLTAGE $V_{CE\,(sat)}$ (V)


I_F – V_F
Ta = 25°C Typ.
DIODE FORWARD CURRENT I_F (A)
0.6
0.4
0.2
0
0
0.4
0.8
1.2
1.6
DIODE FORWARD VOLTAGE V_F (V)


P_D – Ta
① Type-AP Free Air
② Type-F Free Air
Type-AF
POWER DISSIPATION P_D (W)
1.5
1.0
0.5
0
0
50
100
150
AMBIENT TEMPERATURE Ta (°C)

PACKAGE DIMENSIONS

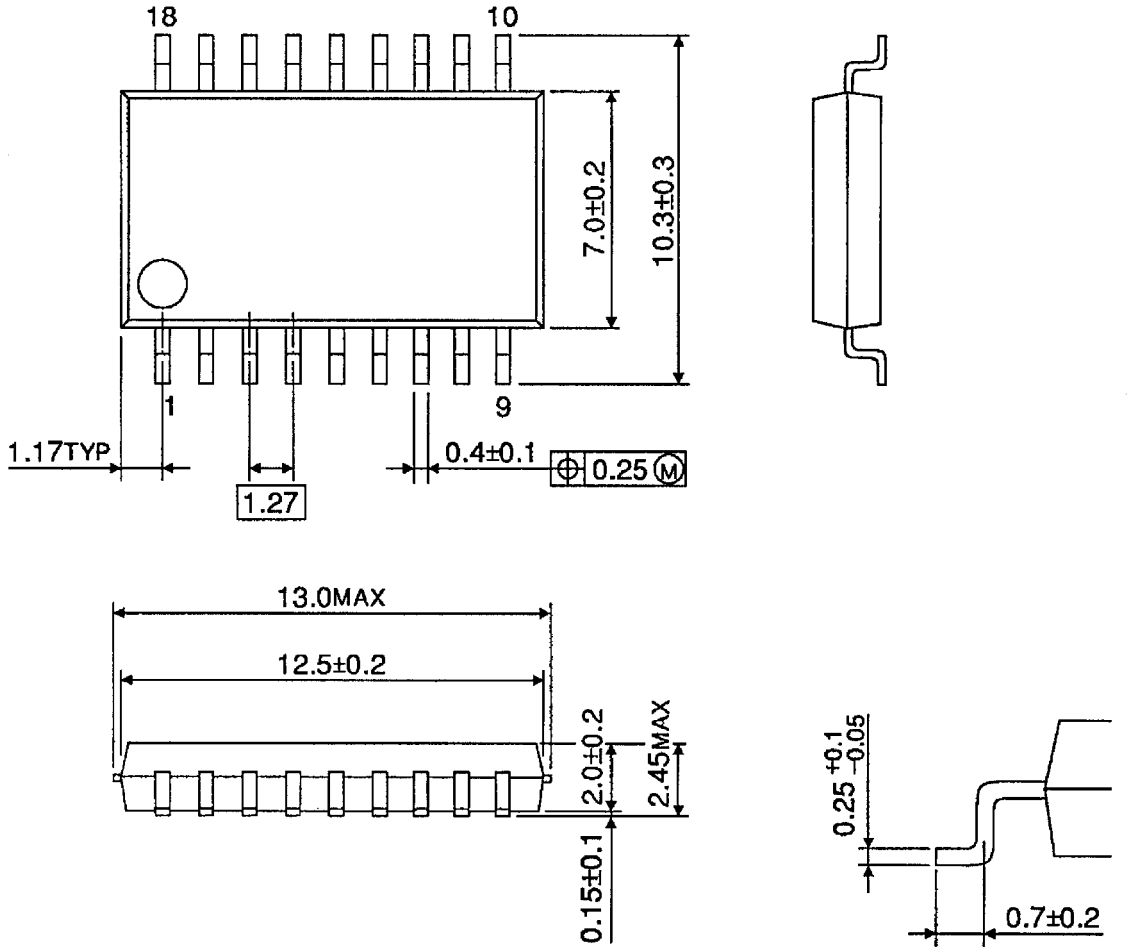
DIP18−P−300−2.54D Unit: mm



Weight: 1.47 g (Typ.)

PACKAGE DIMENSIONS

SOP18−P−375−1.27 Unit: mm



Weight: 0.41 g (Typ.)

RESTRICTIONS ON PRODUCT USE

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