

6MBI75UC-120



IGBT Module U-Series 1200V / 75A 6 in one-package

■ Features

- High speed switching
- Voltage drive
- Low inductance module structure

■ Applications

- Inverter for Motor drive
- AC and DC Servo drive amplifier
- Uninterruptible power supply
- Industrial machines, such as Welding machines

■ Maximum ratings and characteristics

● Absolute maximum ratings (at Tc=25°C unless otherwise specified)

Item		Symbol	Conditions		Rating	Unit
Collector-Emitter voltage		V _{CES}			1200	V
Gate-Emitter voltaqa		V _{GES}			±20	V
Collector current		I _c	Continuous	T _c =25°C	100	A
				T _c =80°C	75	
		I _{cp}	1ms	T _c =25°C	200	
				T _c =80°C	150	
		-I _c			75	
		-I _c pulse			150	
Collector Power Dissipation		P _c	1 device		390	W
Junction temperature		T _j			+150	°C
Storage temperature		T _{stg}			-40 to +125	
Isolation voltage	between terminal and copper base *1	V _{iso}	AC:1min.		2500	VAC
Screw Torque		Mounting *2			3.5	N·m

*1 : All terminals should be connected together when isolation test will be done.

*2 : Recommendable value : 2.5 to 3.5 N·m(M5)

● Electrical characteristics (at T_J=25°C unless otherwise specified)

Item	Symbols	Conditions		Characteristics			Unit
				Min.	Typ.	Max.	
Zero gate voltage collector current	ICES	VGE=0V, VCE=1200V		—	—	1.0	mA
Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V		—	—	200	nA
Gate-Emitter threshold voltage	VGE(th)	VCE=20V, IC=75mA		4.5	6.5	8.5	V
Collector-Emitter saturation voltage	VCE(sat) (chip)	VGE=15V, IC=75A	TJ=25°C	—	1.75	2.10	V
			TJ=125°C	—	2.00	—	
Input capacitance	Cies	VCE=10V, VGE=0V, f=1MHz		—	8	—	nF
Turn-on time	ton	VCC=600V IC=75A VGE=±15V		—	0.36	1.20	μs
	tr			—	0.21	0.60	
	tr(i)			—	0.03	—	
Turn-off time	toff	RG=9.1 Ω		—	0.37	1.00	
	tr			—	0.07	0.30	
Forward on voltage	VF	VGE=0V	TJ=25°C	—	1.60	1.90	V
	(chip)	IF=75A	TJ=125°C	—	1.70	—	
Reverse recovery time	trr	IF=75A		—	—	0.35	μs
Lead resistance, terminal-chip*3	R lead	Without shunt resistance		—	5.7	—	mΩ
Shunt resistance	R shunt	Resistance of R1,R2,R3 *4		—	2.4	—	

*3: Biggest internal terminal resistance among arm.

*4: R1, R2,R3 is shown in equivalent circuit (p5)

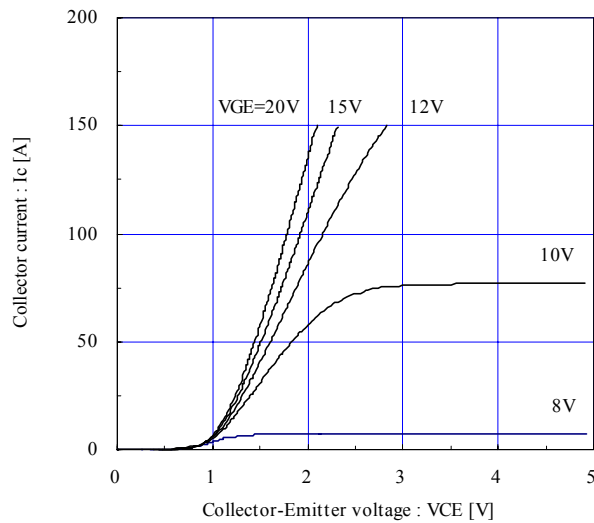
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	R _{th(j-c)}	IGBT	—	—	0.32	°C/W
	R _{th(j-c)}	FWD	—	—	0.49	°C/W
Contact Thermal resistance	R _{th(c-f)*5}	With thermal compound	—	0.05	—	°C/W

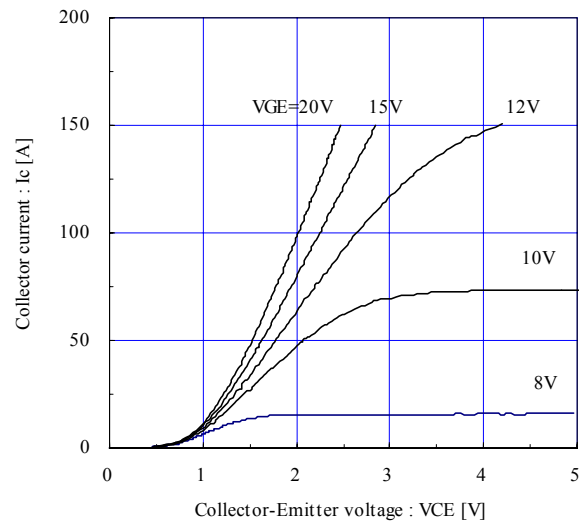
*5 : This is the value which is defined mounting on the additional cooling fin with thermal compound.

Characteristics (Representative)

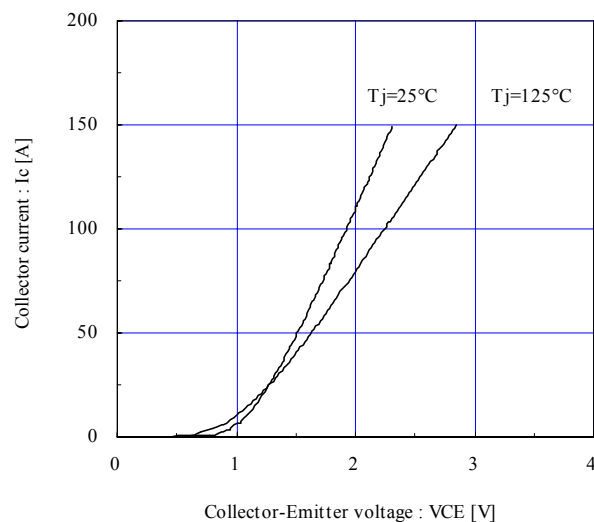
Collector current vs. Collector-Emitter voltage (typ.)

 $T_j = 25^\circ\text{C}$ / chip

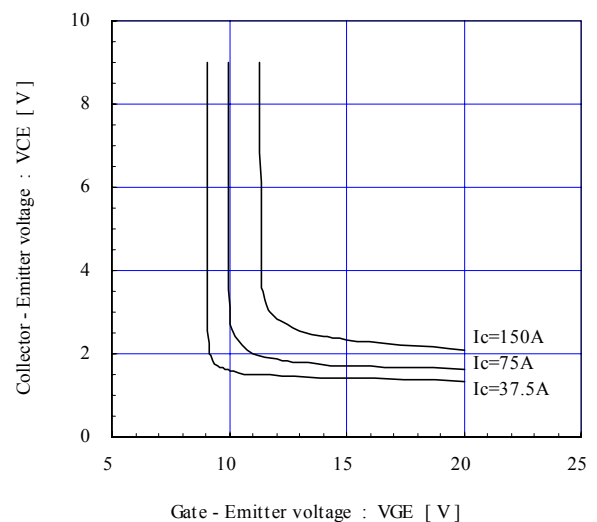
Collector current vs. Collector-Emitter voltage (typ.)

 $T_j = 125^\circ\text{C}$ / chip

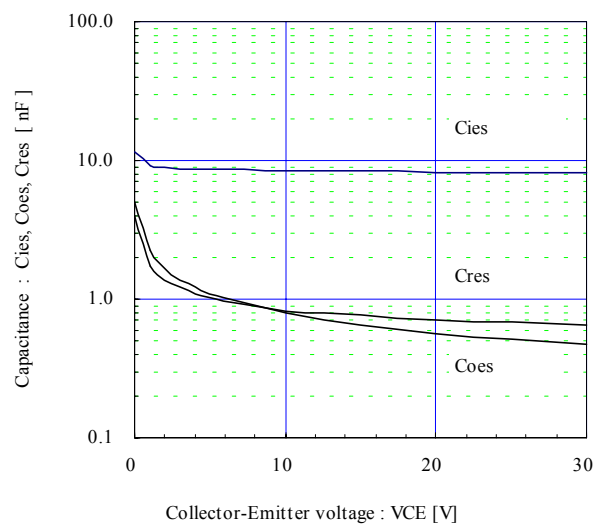
Collector current vs. Collector-Emitter voltage (typ.)

 $V_{GE} = 15\text{V}$ / chip

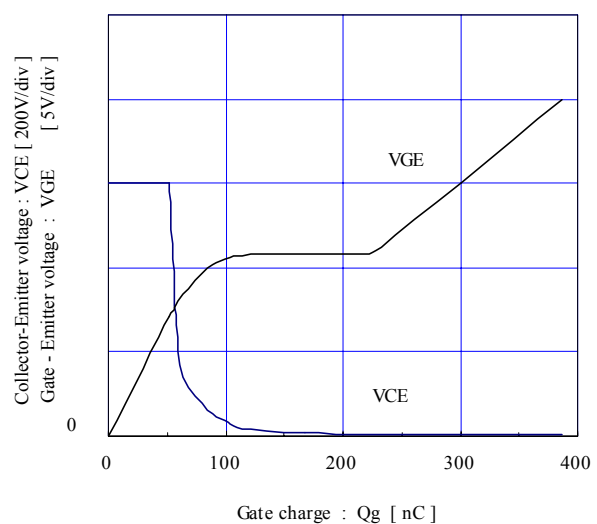
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)

 $T_j = 25^\circ\text{C}$ / chip

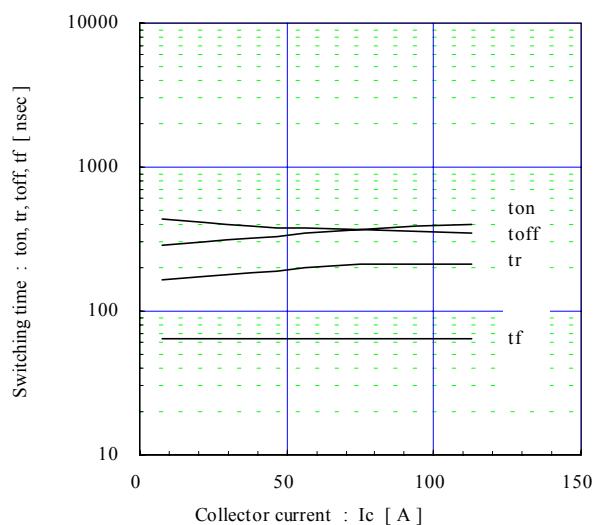
Capacitance vs. Collector-Emitter voltage (typ.)

 $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$, $T_j = 25^\circ\text{C}$ 

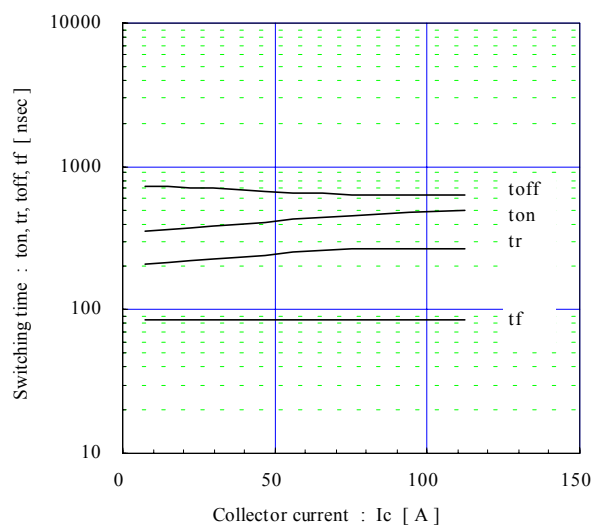
Dynamic Gate charge (typ.)

 $V_{cc} = 600\text{V}$, $I_c = 75\text{A}$, $T_j = 25^\circ\text{C}$ 

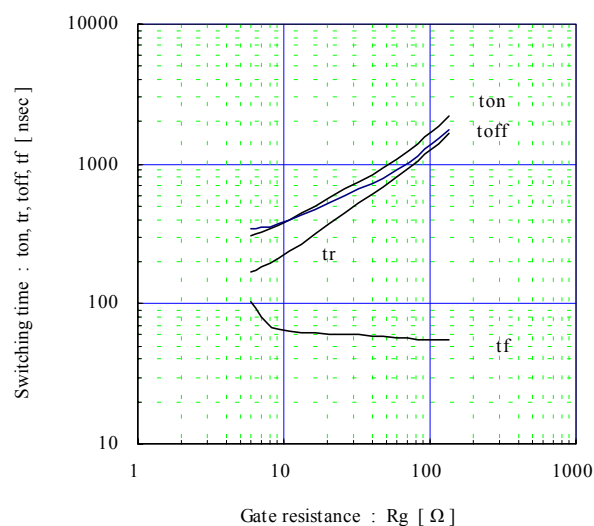
Switching time vs. Collector current (typ.)

 $V_{cc}=600V$, $V_{GE}=\pm 15V$, $R_g=9.1\Omega$, $T_j=25^\circ C$ 

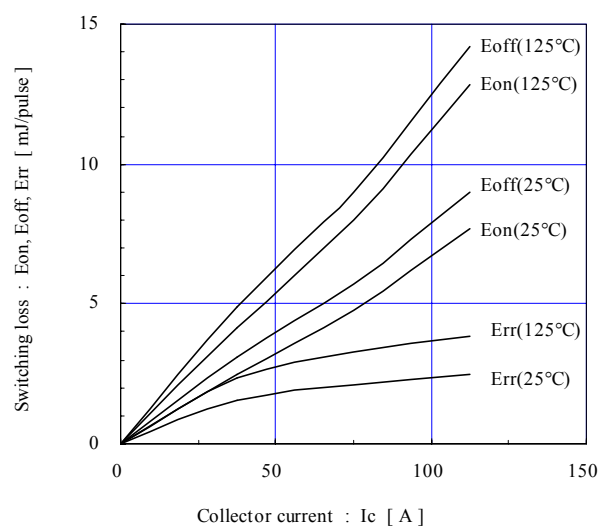
Switching time vs. Collector current (typ.)

 $V_{cc}=600V$, $V_{GE}=\pm 15V$, $R_g=9.1\Omega$, $T_j=125^\circ C$ 

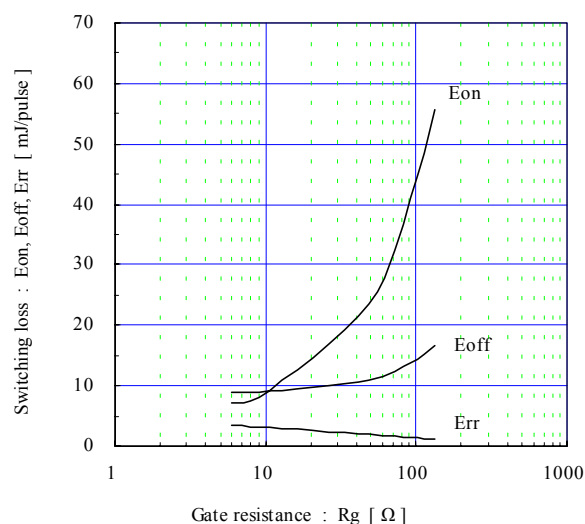
Switching time vs. Gate resistance (typ.)

 $V_{cc}=600V$, $I_c=75A$, $V_{GE}=\pm 15V$, $T_j=25^\circ C$ 

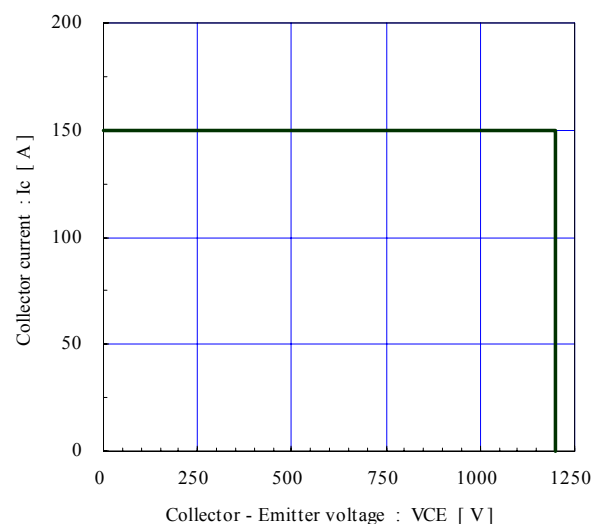
Switching loss vs. Collector current (typ.)

 $V_{cc}=600V$, $V_{GE}=\pm 15V$, $R_g=9.1\Omega$ 

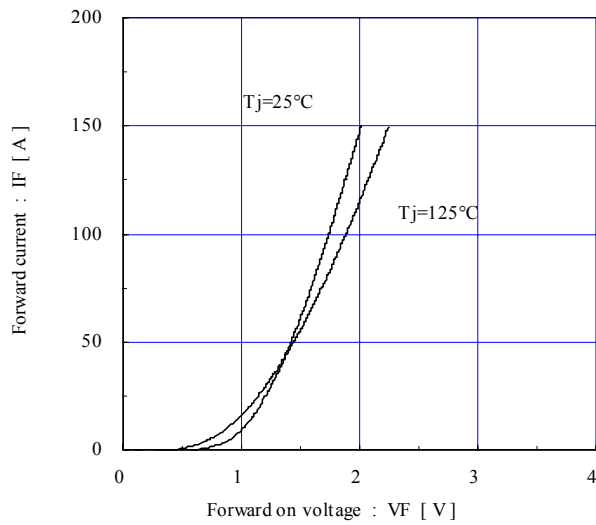
Switching loss vs. Gate resistance (typ.)

 $V_{cc}=600V$, $I_c=75A$, $V_{GE}=\pm 15V$, $T_j=125^\circ C$ 

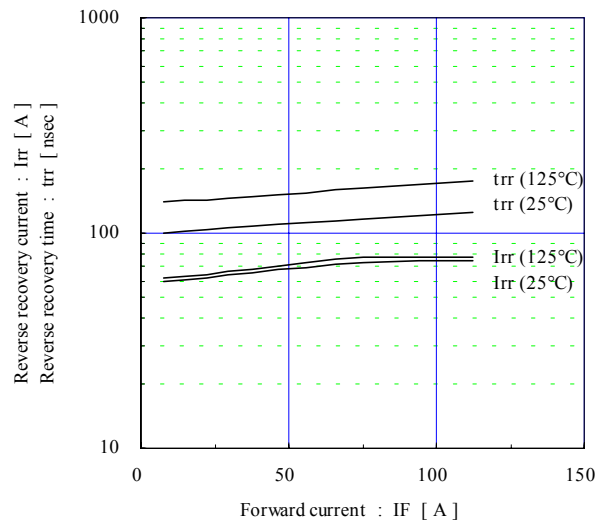
Reverse bias safe operating area (max.)

 $+V_{GE}=15V$, $-V_{GE} \leq 15V$, $R_g \geq 9.1\Omega$, $T_j \leq 125^\circ C$ 

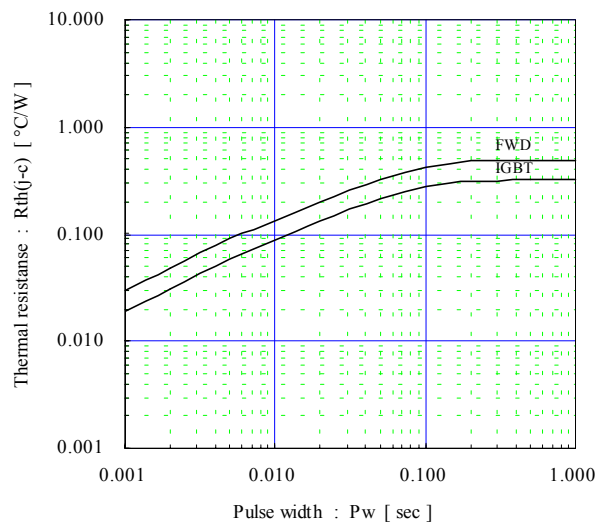
Forward current vs. Forward on voltage (typ.)
chip



Reverse recovery characteristics (typ.)
Vcc=600V, VGE=±15V, Rg=9.1Ω



Transient thermal resistance (max.)



M632

Top View Dimensions:

- Overall Width: 122 ± 1
- Overall Height: 62 ± 1
- Internal Width: 110 ± 0.3
- Internal Height: 57.5 ± 0.3
- Pin Pitch: 2.5 ± 0.3
- Pin 1 to Pin 30 Distance: 94.5 ± 0.3
- Pin 31 to Pin 40 Distance: 11.5 ± 0.5
- Pin 41 to Pin 48 Distance: 11.5 ± 0.5
- Pin 49 to Pin 56 Distance: 11.5 ± 0.5
- Pin 57 to Pin 64 Distance: 11.5 ± 0.5
- Pin 65 to Pin 72 Distance: 11.5 ± 0.5
- Pin 73 to Pin 80 Distance: 11.5 ± 0.5
- Pin 81 to Pin 88 Distance: 11.5 ± 0.5
- Pin 89 to Pin 96 Distance: 11.5 ± 0.5
- Pin 97 to Pin 104 Distance: 11.5 ± 0.5
- Pin 105 to Pin 112 Distance: 11.5 ± 0.5
- Pin 113 to Pin 120 Distance: 11.5 ± 0.5
- Pin 121 to Pin 128 Distance: 11.5 ± 0.5
- Pin 129 to Pin 136 Distance: 11.5 ± 0.5
- Pin 137 to Pin 144 Distance: 11.5 ± 0.5
- Pin 145 to Pin 152 Distance: 11.5 ± 0.5
- Pin 153 to Pin 160 Distance: 11.5 ± 0.5
- Pin 161 to Pin 168 Distance: 11.5 ± 0.5
- Pin 169 to Pin 176 Distance: 11.5 ± 0.5
- Pin 177 to Pin 184 Distance: 11.5 ± 0.5
- Pin 185 to Pin 192 Distance: 11.5 ± 0.5
- Pin 193 to Pin 200 Distance: 11.5 ± 0.5
- Pin 201 to Pin 208 Distance: 11.5 ± 0.5
- Pin 209 to Pin 216 Distance: 11.5 ± 0.5
- Pin 217 to Pin 224 Distance: 11.5 ± 0.5
- Pin 225 to Pin 232 Distance: 11.5 ± 0.5
- Pin 233 to Pin 240 Distance: 11.5 ± 0.5
- Pin 241 to Pin 248 Distance: 11.5 ± 0.5
- Pin 249 to Pin 256 Distance: 11.5 ± 0.5
- Pin 257 to Pin 264 Distance: 11.5 ± 0.5
- Pin 265 to Pin 272 Distance: 11.5 ± 0.5
- Pin 273 to Pin 280 Distance: 11.5 ± 0.5
- Pin 281 to Pin 288 Distance: 11.5 ± 0.5
- Pin 289 to Pin 296 Distance: 11.5 ± 0.5
- Pin 297 to Pin 304 Distance: 11.5 ± 0.5
- Pin 305 to Pin 312 Distance: 11.5 ± 0.5
- Pin 313 to Pin 320 Distance: 11.5 ± 0.5
- Pin 321 to Pin 328 Distance: 11.5 ± 0.5
- Pin 329 to Pin 336 Distance: 11.5 ± 0.5
- Pin 337 to Pin 344 Distance: 11.5 ± 0.5
- Pin 345 to Pin 352 Distance: 11.5 ± 0.5
- Pin 353 to Pin 360 Distance: 11.5 ± 0.5
- Pin 361 to Pin 368 Distance: 11.5 ± 0.5
- Pin 369 to Pin 376 Distance: 11.5 ± 0.5
- Pin 377 to Pin 384 Distance: 11.5 ± 0.5
- Pin 385 to Pin 392 Distance: 11.5 ± 0.5
- Pin 393 to Pin 400 Distance: 11.5 ± 0.5
- Pin 401 to Pin 408 Distance: 11.5 ± 0.5
- Pin 409 to Pin 416 Distance: 11.5 ± 0.5
- Pin 417 to Pin 424 Distance: 11.5 ± 0.5
- Pin 425 to Pin 432 Distance: 11.5 ± 0.5
- Pin 433 to Pin 440 Distance: 11.5 ± 0.5
- Pin 441 to Pin 448 Distance: 11.5 ± 0.5
- Pin 449 to Pin 456 Distance: 11.5 ± 0.5
- Pin 457 to Pin 464 Distance: 11.5 ± 0.5
- Pin 465 to Pin 472 Distance: 11.5 ± 0.5
- Pin 473 to Pin 480 Distance: 11.5 ± 0.5
- Pin 481 to Pin 488 Distance: 11.5 ± 0.5
- Pin 489 to Pin 496 Distance: 11.5 ± 0.5
- Pin 497 to Pin 504 Distance: 11.5 ± 0.5
- Pin 505 to Pin 512 Distance: 11.5 ± 0.5
- Pin 513 to Pin 520 Distance: 11.5 ± 0.5
- Pin 521 to Pin 528 Distance: 11.5 ± 0.5
- Pin 529 to Pin 536 Distance: 11.5 ± 0.5
- Pin 537 to Pin 544 Distance: 11.5 ± 0.5
- Pin 545 to Pin 552 Distance: 11.5 ± 0.5
- Pin 553 to Pin 560 Distance: 11.5 ± 0.5
- Pin 561 to Pin 568 Distance: 11.5 ± 0.5
- Pin 569 to Pin 576 Distance: 11.5 ± 0.5
- Pin 577 to Pin 584 Distance: 11.5 ± 0.5
- Pin 585 to Pin 592 Distance: 11.5 ± 0.5
- Pin 593 to Pin 600 Distance: 11.5 ± 0.5
- Pin 601 to Pin 608 Distance: 11.5 ± 0.5
- Pin 609 to Pin 616 Distance: 11.5 ± 0.5
- Pin 617 to Pin 624 Distance: 11.5 ± 0.5
- Pin 625 to Pin 632 Distance: 11.5 ± 0.5
- Pin 633 to Pin 640 Distance: 11.5 ± 0.5
- Pin 641 to Pin 648 Distance: 11.5 ± 0.5
- Pin 649 to Pin 656 Distance: 11.5 ± 0.5
- Pin 657 to Pin 664 Distance: 11.5 ± 0.5
- Pin 665 to Pin 672 Distance: 11.5 ± 0.5
- Pin 673 to Pin 680 Distance: 11.5 ± 0.5
- Pin 681 to Pin 688 Distance: 11.5 ± 0.5
- Pin 689 to Pin 696 Distance: 11.5 ± 0.5
- Pin 697 to Pin 704 Distance: 11.5 ± 0.5
- Pin 705 to Pin 712 Distance: 11.5 ± 0.5
- Pin 713 to Pin 720 Distance: 11.5 ± 0.5
- Pin 721 to Pin 728 Distance: 11.5 ± 0.5
- Pin 729 to Pin 736 Distance: 11.5 ± 0.5
- Pin 737 to Pin 744 Distance: 11.5 ± 0.5
- Pin 745 to Pin 752 Distance: 11.5 ± 0.5
- Pin 753 to Pin 760 Distance: 11.5 ± 0.5
- Pin 761 to Pin 768 Distance: 11.5 ± 0.5
- Pin 769 to Pin 776 Distance: 11.5 ± 0.5
- Pin 777 to Pin 784 Distance: 11.5 ± 0.5
- Pin 785 to Pin 792 Distance: 11.5 ± 0.5
- Pin 793 to Pin 800 Distance: 11.5 ± 0.5
- Pin 801 to Pin 808 Distance: 11.5 ± 0.5
- Pin 809 to Pin 816 Distance: 11.5 ± 0.5
- Pin 817 to Pin 824 Distance: 11.5 ± 0.5
- Pin 825 to Pin 832 Distance: 11.5 ± 0.5
- Pin 833 to Pin 840 Distance: 11.5 ± 0.5
- Pin 841 to Pin 848 Distance: 11.5 ± 0.5
- Pin 849 to Pin 856 Distance: 11.5 ± 0.5
- Pin 857 to Pin 864 Distance: 11.5 ± 0.5
- Pin 865 to Pin 872 Distance: 11.5 ± 0.5
- Pin 873 to Pin 880 Distance: 11.5 ± 0.5
- Pin 881 to Pin 888 Distance: 11.5 ± 0.5
- Pin 889 to Pin 896 Distance: 11.5 ± 0.5
- Pin 897 to Pin 904 Distance: 11.5 ± 0.5
- Pin 905 to Pin 912 Distance: 11.5 ± 0.5
- Pin 913 to Pin 920 Distance: 11.5 ± 0.5
- Pin 921 to Pin 928 Distance: 11.5 ± 0.5
- Pin 929 to Pin 936 Distance: 11.5 ± 0.5
- Pin 937 to Pin 944 Distance: 11.5 ± 0.5
- Pin 945 to Pin 952 Distance: 11.5 ± 0.5
- Pin

■ Equivalent Circuit Schematic

