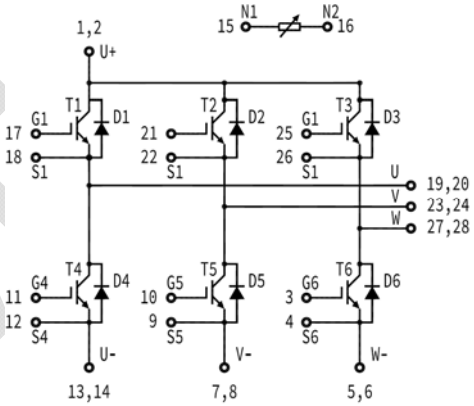
GTS15FF120C6H

IGBT Module

Preliminary Data



Features：

- Trench & Field Stop IGBT
- Short Circuit Rated >10μs
- Low Switching Loss
- 100% RBSOA Tested（2×Ic）
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Applications：

- Industrial Inverters
- Motor Drives

IGBT, Inverter

Maximum Rated Values (T_C=25℃ unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Continuous Collector Current	T_C = 80℃	15	A
		T_C = 25℃	30	A
I_{CM}	Repetitive Peak Collector Current	T_J = 150℃	30	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C = 25℃ T_{Jmax}=150℃	150	W

Electrical Characteristics of IGBT (T_C=25℃ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions		Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C = 1mA, V_{CE} = V_{GE}		5.2	5.9	6.7	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 15A, V_{GE} = 15V	T_J = 25℃		2.15	2.50	V
			T_J = 125℃		2.40		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE} = 0V, V_{CE} = V_{CES}, T_J = 25℃				1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE} = ±20V, V_{CE} = 0V, T_J = 25℃				200	nA
C_{ies}	Input Capacitance	V_{CE} = 25V, V_{GE} = 0V , f =1MHz			1.12		nF
C_{oes}	Output Capacitance				0.09		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V,I_C=15A, R_{Gon} =20Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		78.7		ns
			T_J=125℃		53.4		
t_r	Rise Time		T_J=25℃		34.7		ns
			T_J=125℃		35.6		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V,I_C=15A, R_{Goff}=20Ω,V_{GE}=±15V Inductive Load	T_J=25℃		146.4		ns
			T_J=125℃		154.7		
t_f	Fall Time		T_J=25℃		280		ns
			T_J=125℃		383		
E_{on}	Turn-on Switching Loss	V_{CC}=600V,I_C=15A, R_{Gon} =20Ω,V_{GE}=±15V, di/dt=397A/μs (T_J=125℃) Inductive Load	T_J=25℃		1.4		mJ
			T_J=125℃		1.59		
E_{off}	Turn-off Switching Loss	V_{CC}=600V,I_C=15A, R_{Goff} =20Ω,V_{GE}= ±15V, du/dt=2086V/μs (T_J=125℃) Inductive Load	T_J=25℃		0.41		mJ
			T_J=125℃		0.76		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		399		nC
RBSOA	Reverse Bias Safe Operation Area	I_C=30A,V_{CC}=1050V,Vp=1200V, R_{Gon} = 20Ω, R_{Goff} =20Ω V_{GE}=+15V to 0V, T_J=150°C		Trapezoid			
SCSOA	Short Circuit Safe Operation Area	V_{CC} = 600V, V_{GE} = 15V, T_J = 150℃		10			us
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case(per leg)				0.825		℃/W

Diode, Inverter

Maximum Rated Values (T_C=25℃ unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	15	A
I_{FM}	Diode Maximum Forward Current	30	A

Electrical Characteristics of Diode (T_C=25℃ unless otherwise specified)

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F =15A	T_J = 25℃		2.00		V
			T_J = 125℃		2.20		
I_{rr}	Peak Reverse Recovery Current	I_F＝15A, -di/dt =370A/μs, (T_J=125℃) V_{rr} = 600V, V_{GE} = -15V	T_J = 25℃		12		A
			T_J = 125℃		15		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		0.94		μC
			T_J = 125℃		1.64		
E_{rec}	Reverse Recovery Energy		T_J = 25℃		0.37		mJ
			T_J = 125℃		0.75		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (Per leg)				1.412		℃/W

Internal NTC-Thermistor Characteristics

R_{25}	T_C =25℃	22.7		kΩ
△R/R	T_C =100℃， R_{100} =481Ω		±3	%
P_{25}	T_C =25℃	200		mW
$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$	3950		K
$B_{25/80}$	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298.15K))]$	4000		K

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted)	f = 50Hz, 1minute	2500			V
T_J	Maximum Junction Temperature				150	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+125	℃
CTI	Comparative Tracking Index		200			
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)			0.13		℃/W
T	Mounting Screw:M4		1.0		1.5	N·m
G	Weight			39		g

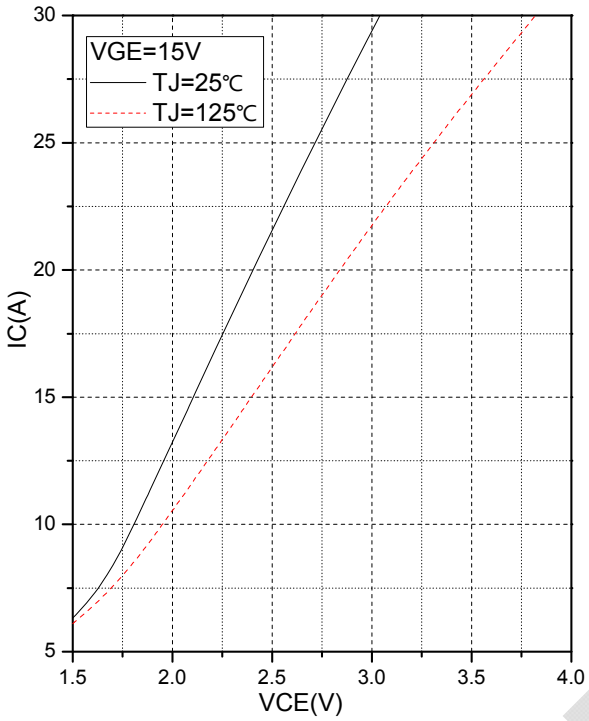


Fig.1 Typical Saturation Voltage Characteristics

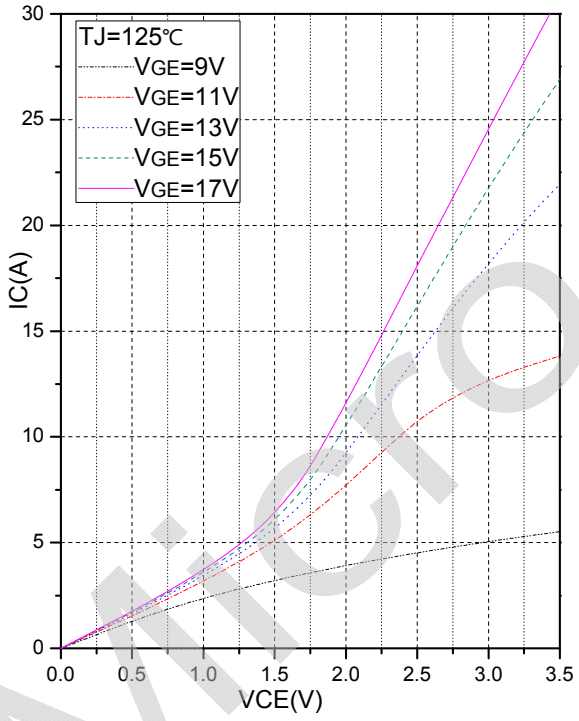


Fig.2 Typical Output Characteristics

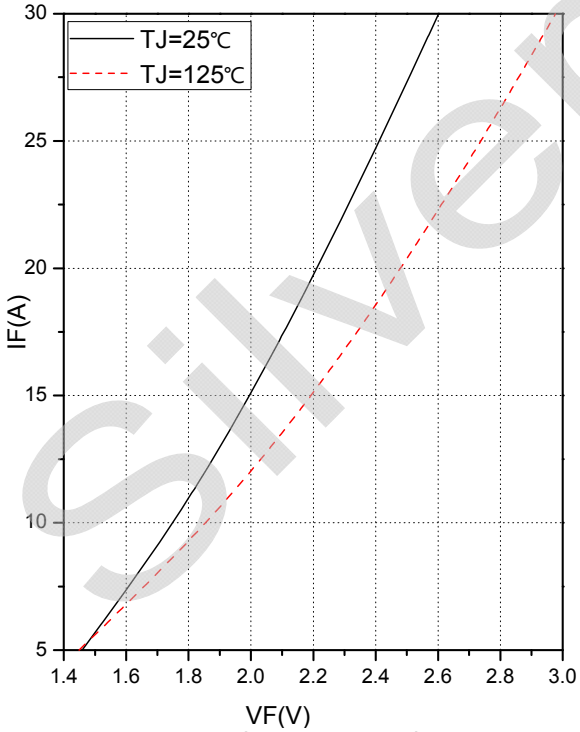


Fig.3 Forward Characteristics of Diode

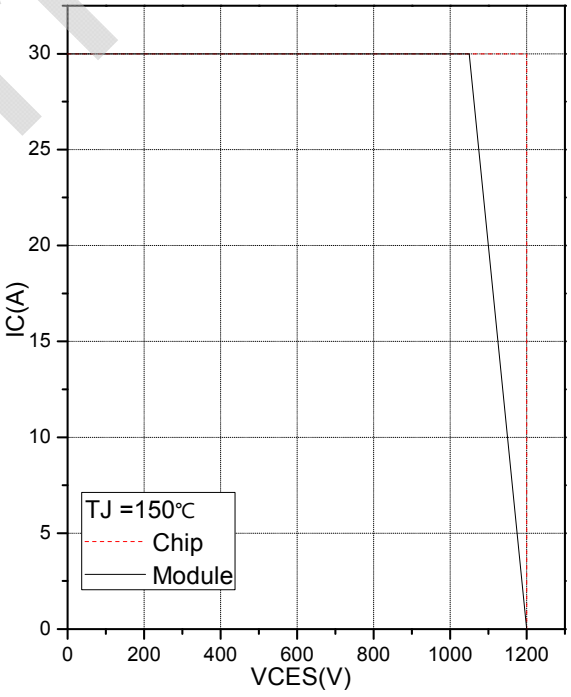


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

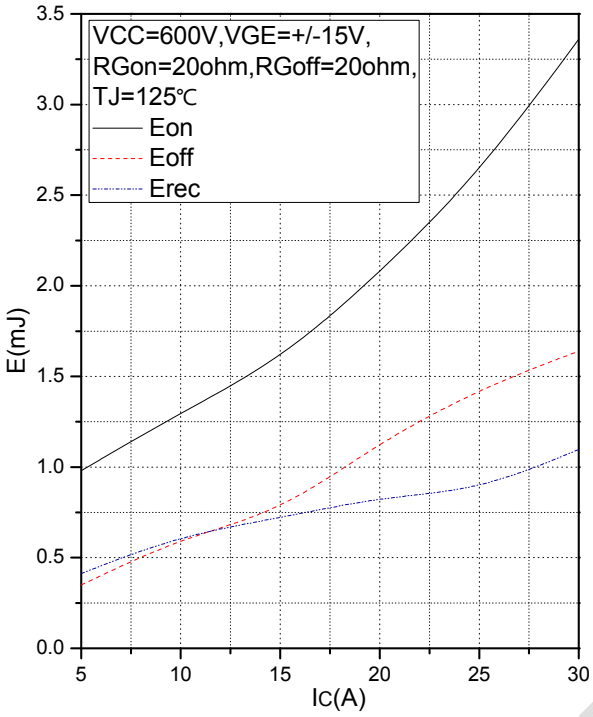


Fig.5 Typical Switching Loss vs. Collector Current

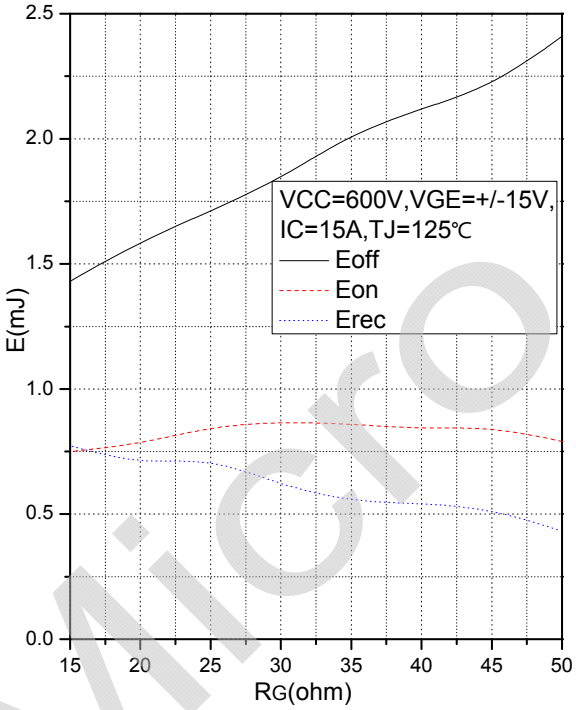


Fig.6 Typical Switching Loss vs. Gate Resistance

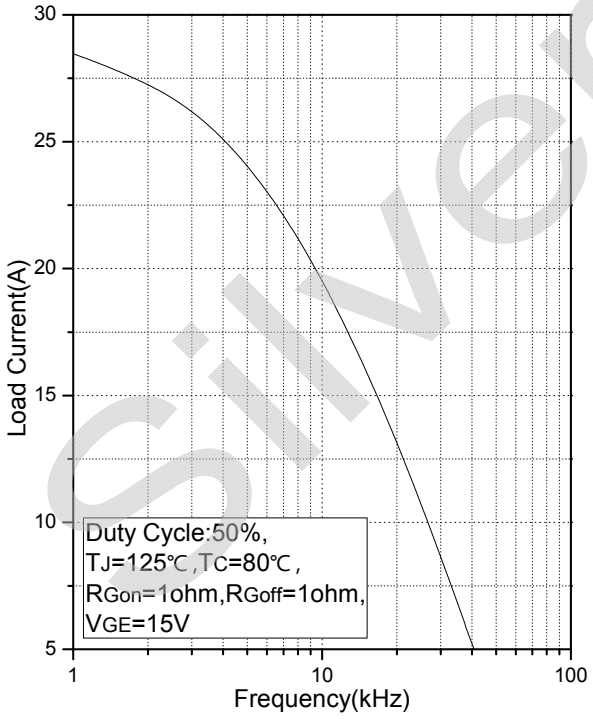


Fig.7 Typical Load Current vs. Frequency

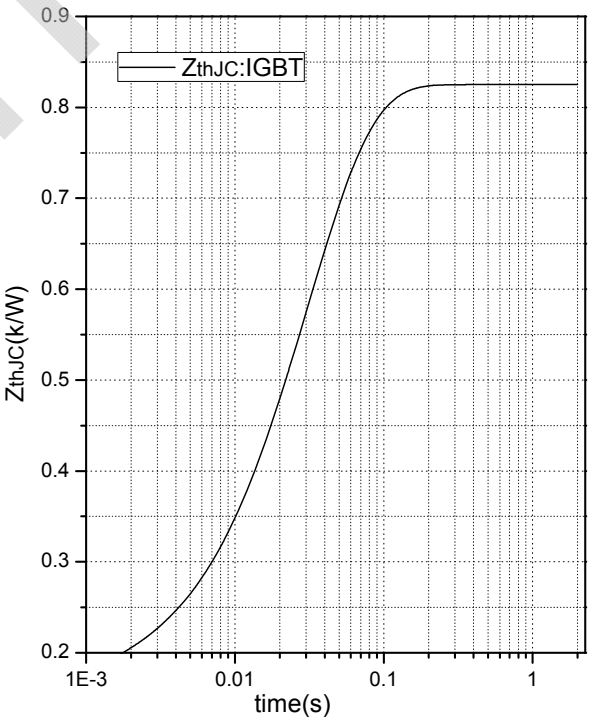


Fig.8 Transient Thermal Impedance (IGBT)

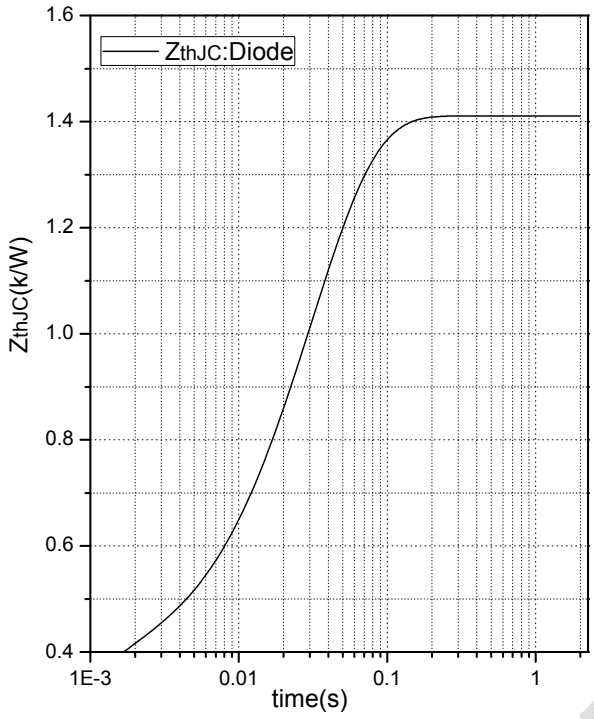


Fig.9 Transient Thermal Impedance (Diode)

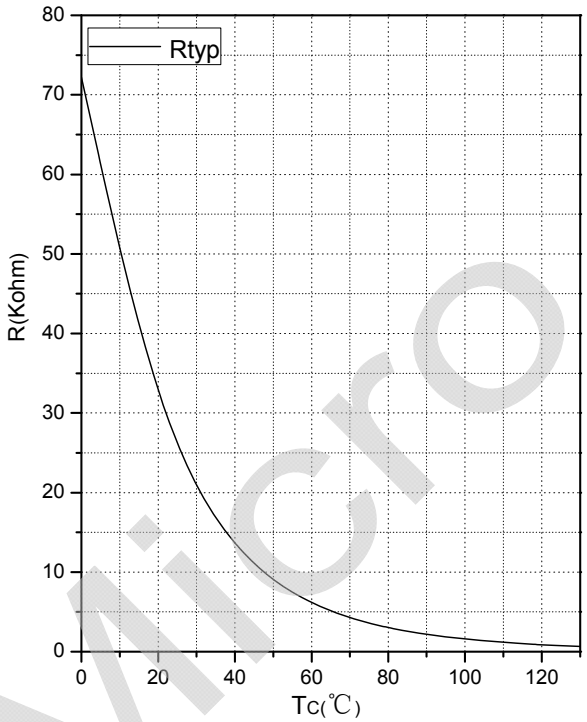
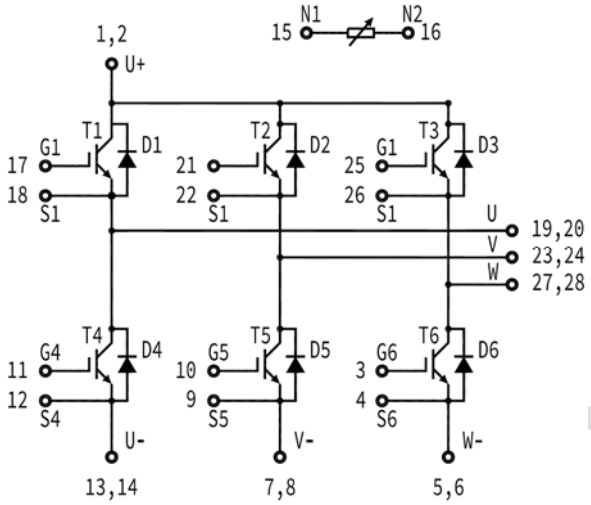
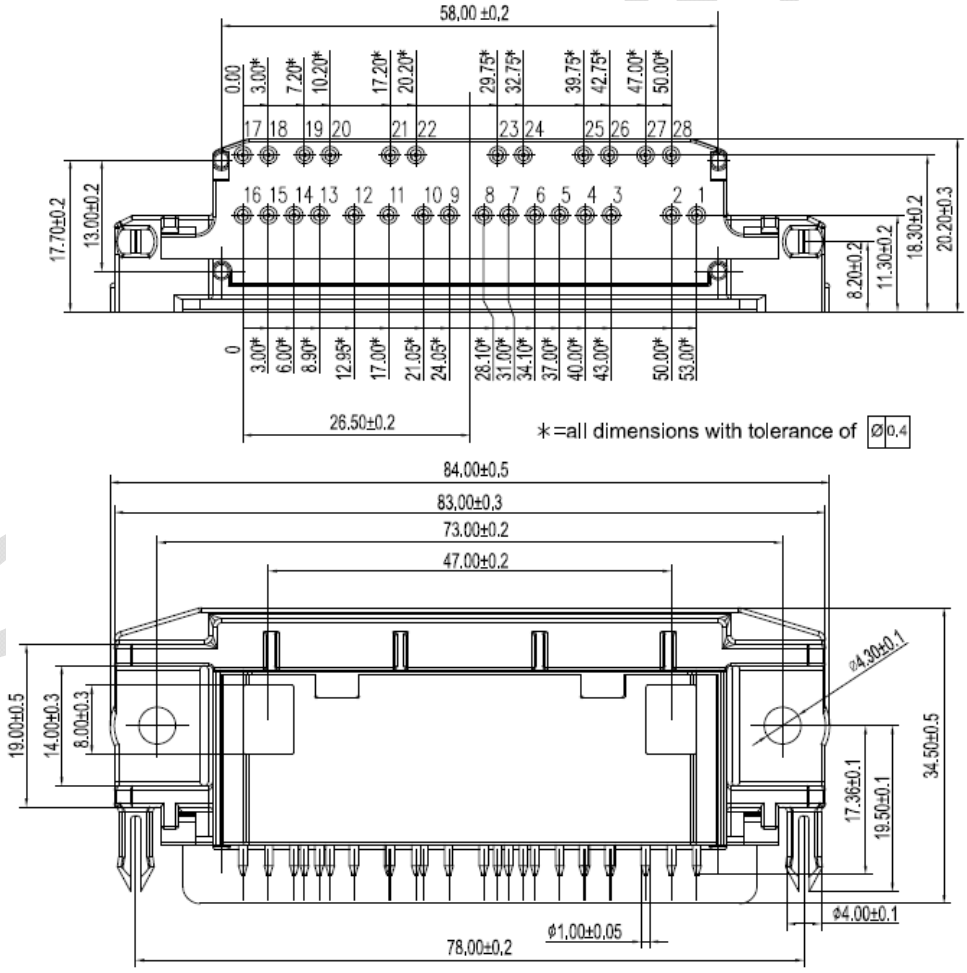


Fig.10 NTC Temperature Characteristics

Internal Circuit



Package Outline (Unit: mm):



Date	Revision	Notes
09/26/2019	01	Initial Release

Announcement

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