IS627

DESCRIPTION

The IS627 optically coupled isolators consists of an infrared light emitting diode and a high voltage NPN silicon photo darlington which has an integral base-emitter resistor to optimise switching speed and elevated temperature characteristics in a standard 4 pin Dual In Line Plastic Package.

FEATURES

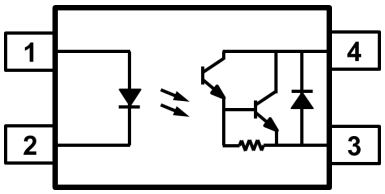
- AC Isolation Voltage 5000V_{RMS}
- High Current Transfer Ratio 1000% minimum
- Wide Operating Temperature Range -30°C to +110°C
- Lead Free and RoHS Compliant
- UL File E91231 Package Code “FF”

APPLICATIONS

- Modems
- Fax and Copying Machines
- Numerical Controllers
- Signal Transmissions between Systems of Different Potentials and Impedances

ORDER INFORMATION

- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount
- Add SMT&R after PN for Surface Mount Tape & Reel



1 Anode
2 Cathode
3 Emitter
4 Collector

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device.
Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input	
Forward Current	50mA
Reverse Voltage	6V
Junction Temperature	125°C
Power dissipation	70mW
Output	
Collector to Emitter Voltage V_{CEO}	300V
Emitter to Collector Voltage V_{ECO}	0.1V
Collector Current	150mA
Junction Temperature	125°C
Power Dissipation	150mW
Total Package	
Isolation Voltage	5000V_{RMS}
Total Power Dissipation	200mW
Operating Temperature	-30 to 110°C
Storage Temperature	-55 to 125°C
Lead Soldering Temperature (10s)	260°C

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ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	I_F = 20mA		1.2	1.4	V
Reverse Leakage	I_R	V_R = 4V			10	µA
Terminal Capacitance	C_t	V = 0V, f = 1KHz		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector−Emitter Breakdown Voltage	BV_{CEO}	I_C = 0.1mA, I_F = 0mA	300			V
Emitter−Collector Breakdown Voltage	BV_{ECO}	I_E = 10µA, I_F = 0mA	0.1			V
Collector−Emitter Dark Current	I_{CEO}	V_{CE} = 200V, I_F = 0mA			200	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	I_F = 1mA, V_{CE} = 2V	1000	4000	15000	%
Collector−Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = 20mA, I_C = 100mA			1.2	V
Floating Capacitance	C_f	V = 0V, f = 1MHz		0.6	1	pF
Cut-Off Frequency	fc	V_{CE} = 2V, I_C = 20mA R_L = 100Ω, −3dB	1	7		kHz
Rise Time	t_r	V_{CE} = 2V, I_C = 20mA R_L = 100Ω		100	300	µs
Fall Time	t_f			20	100	

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input to Output Isolation Voltage	V_{ISO}	AC, RH = 40% to 60%, 1 min Note 1	5000			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	V_{IO}= 500V, RH = 40% to 60% Note 1	$5x10^{10}$	$1x10^{11}$		Ω

Note 1 : Measure with input leads shorted together and output leads shorted together.

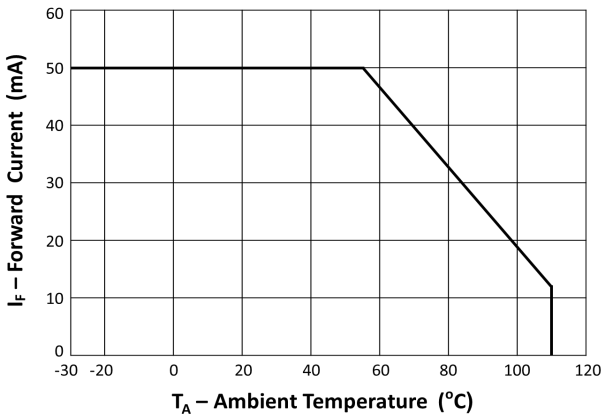


Fig 1 Forward Current vs Ambient Temperature

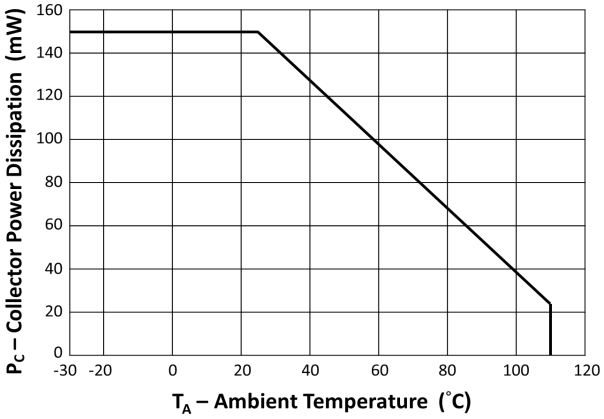


Fig 2 Collector Power Dissipation vs Ambient Temperature

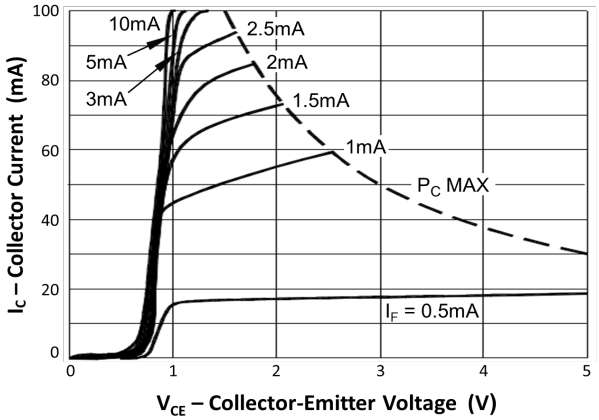


Fig 3 Collector Current vs Collector-Emitter Voltage

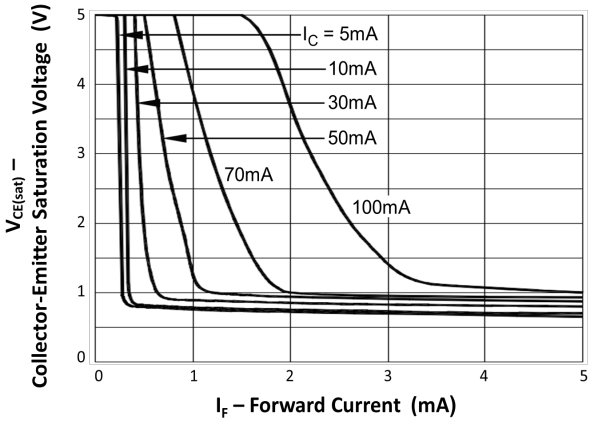


Fig 4 Collector-Emitter Saturation Voltage vs Forward Current

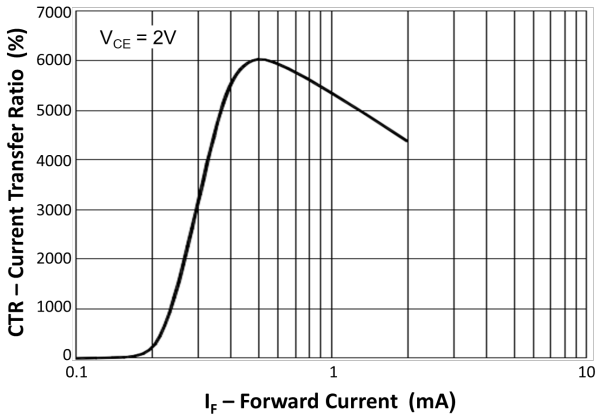


Fig 5 Current Transfer Ratio vs Forward Current

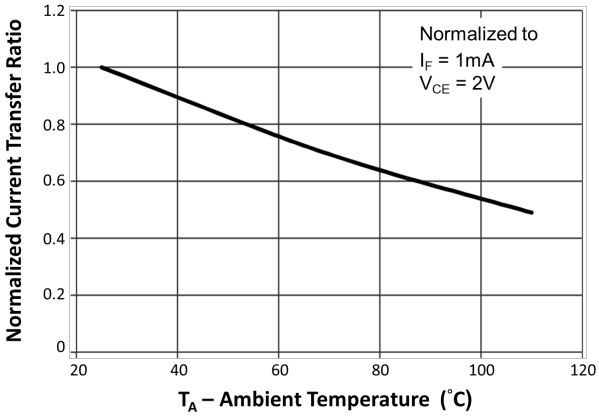


Fig 6 Normalized Current Transfer Ratio vs Ambient Temperature

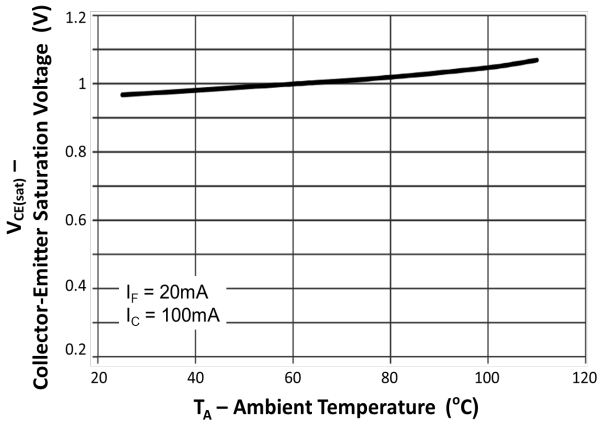


Fig 7 Collector-Emitter Saturation Voltage vs Ambient Temperature

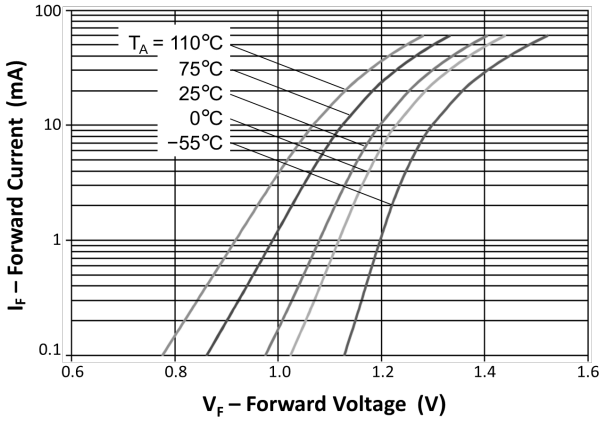


Fig 8 Forward Current vs Forward Voltage

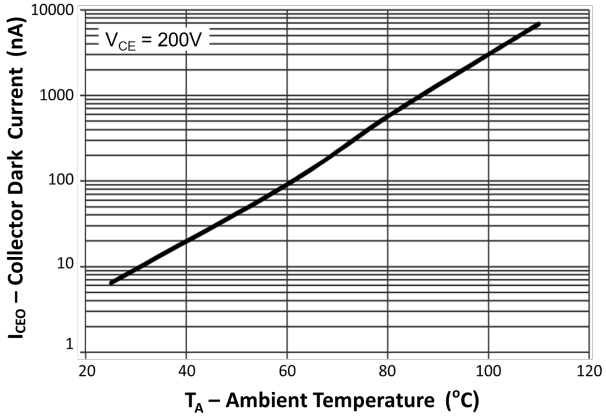


Fig 9 Collector Dark Current vs Ambient Temperature

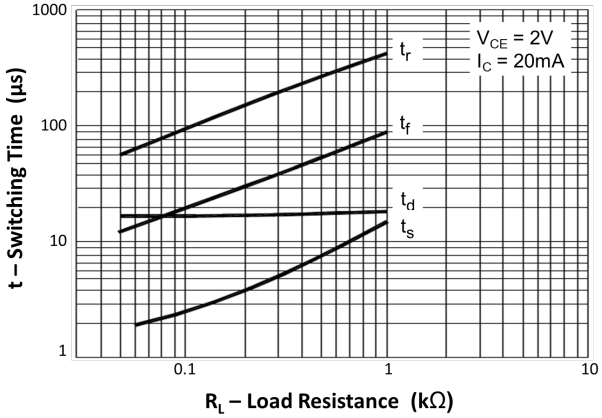


Fig 10 Response Time vs Load Resistance

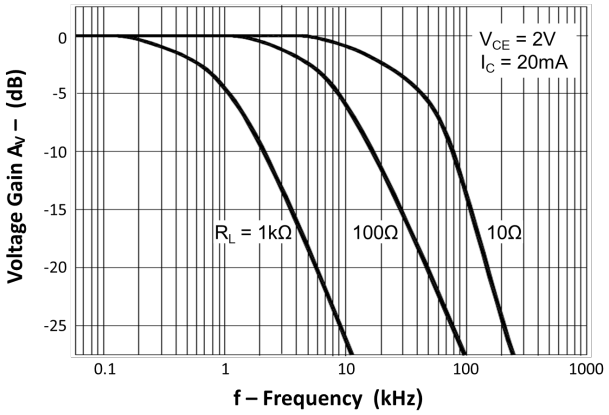
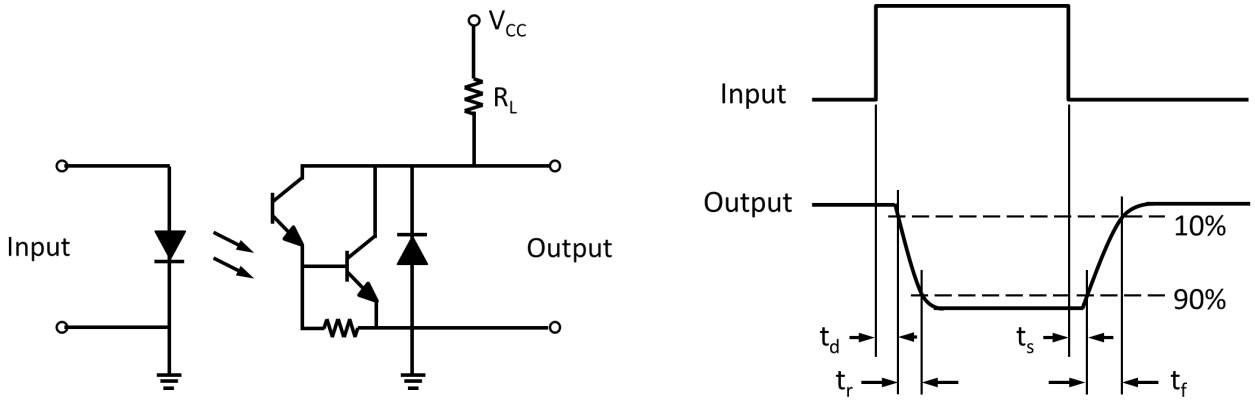
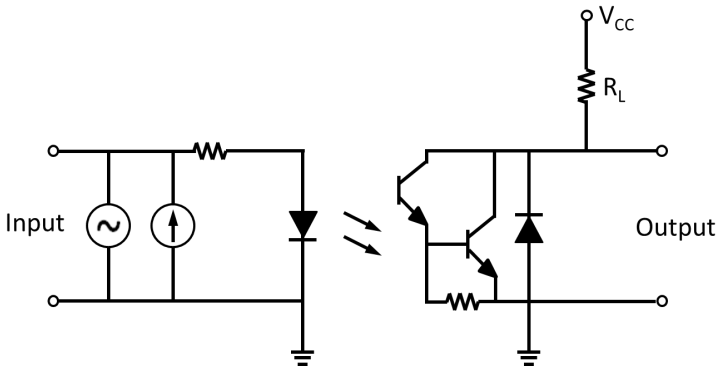


Fig 11 Frequency Response



Response Time Test Circuit and Waveform



Frequency Response Test Circuit

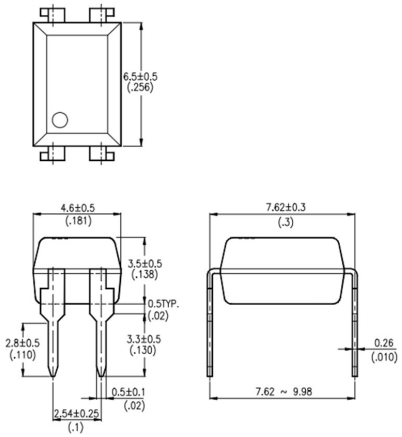
ORDER INFORMATION

IS627 (UL Approval)			
After PN	**PN**	**Description**	**Packing quantity**
None	IS627	Standard DIP4	100 pcs per tube
G	IS627G	10mm Lead Spacing	100 pcs per tube
SM	IS627SM	Surface Mount	100 pcs per tube
SMT&R	IS627SMT&R	Surface Mount Tape & Reel	2000 pcs per reel

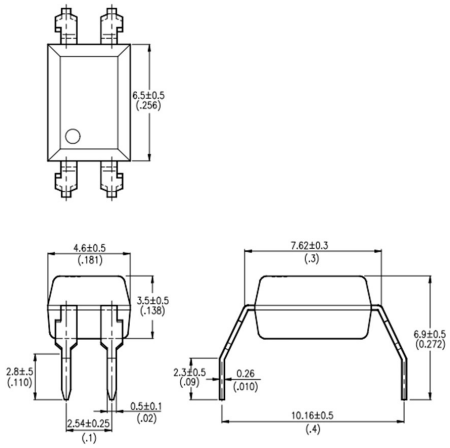
PACKAGE DIMENSIONS in mm (inch)

DIP

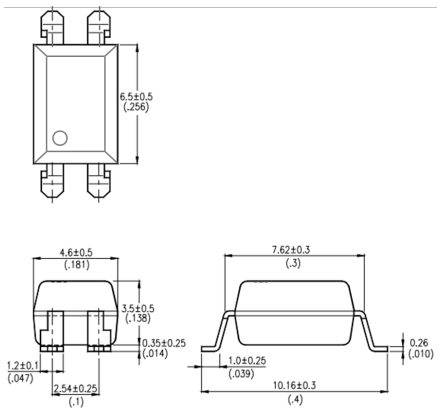
IS627



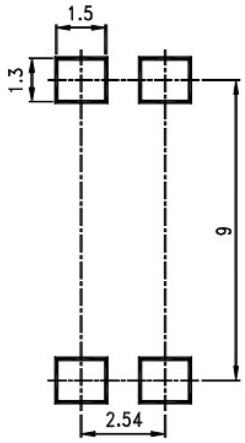
IS627G



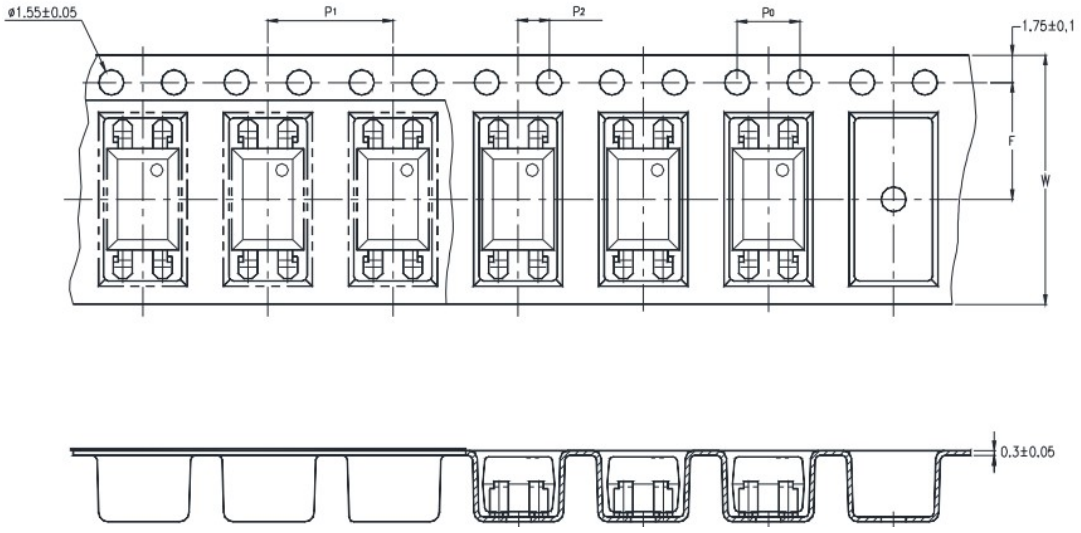
IS627SM



RECOMMENDED PAD LAYOUT FOR SMD (mm)

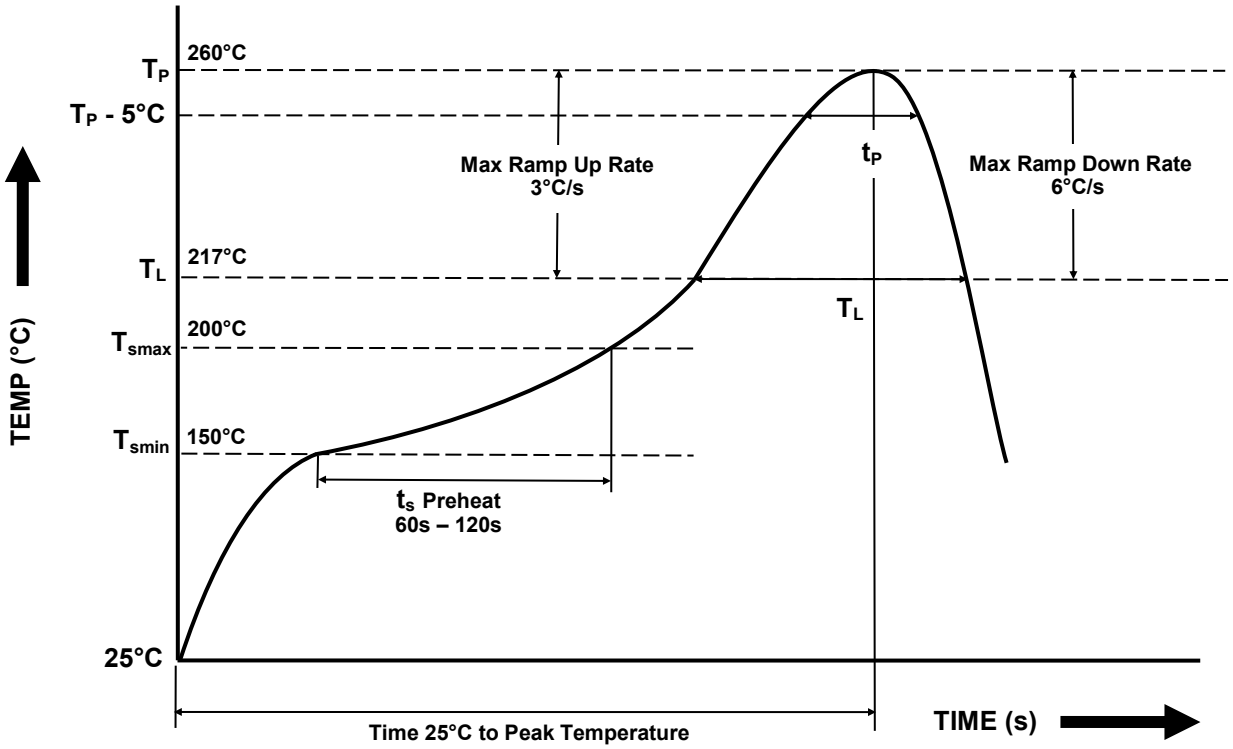


TAPE AND REEL PACKAGING



Description	Symbol	Dimension mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P_0	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	7.5 ± 0.1 (0.295)
	P_2	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P_1	8 ± 0.1 (0.315)

IR REFLOW SOLDERING TEMPERATURE PROFILE FOR SMD
One Time Reflow Soldering is Recommended.
Do not immerse device body in solder paste.



Profile Details	Conditions
Preheat - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s)	 150°C 200°C 60s - 120s
Soldering Zone - Peak Temperature (T_P) - Time at Peak Temperature - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature (T_P – 5°C) - Time maintained above T_L (t_L) - Ramp Up Rate (T_L to T_P) - Ramp Down Rate (T_P to T_L)	 260°C 10s max 217°C 30s max 60s - 100s 3°C/s max 6°C/s max
Average Ramp Up Rate (T_{smax} to T_P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max

ISOCOM COMPONENTS

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