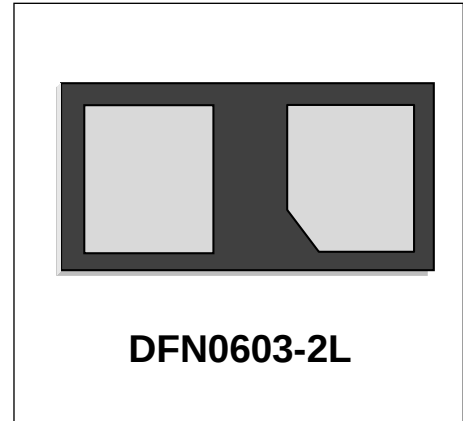




Features

- Small Body Outline Dimensions:
0.60mm x 0.30 mm
- Protects one I/O or power line
- Low Clamping Voltage
- Ultra Low Capacitance: 0.15pF
- Working Voltage: 5 V
- Low Leakage Current



IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2 (ESD) $\pm 12\text{kV}$ (air), $\pm 12\text{kV}$ (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 3A (8/20 μs)

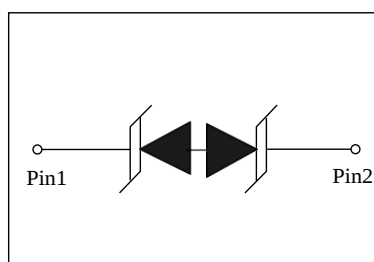
Mechanical Characteristics

- DFN0603-2L package
- Marking: Marking Code
- Packaging: Tape and Reel per EIA 481
- RoHS Compliant

Applications

- HDMI 1.4 and HDMI 2.0
- USB 3.0 and USB 3.1
- USB Type-C
- Thunderbolt
- MIPI/MDDI
- 10GbE
- DVI

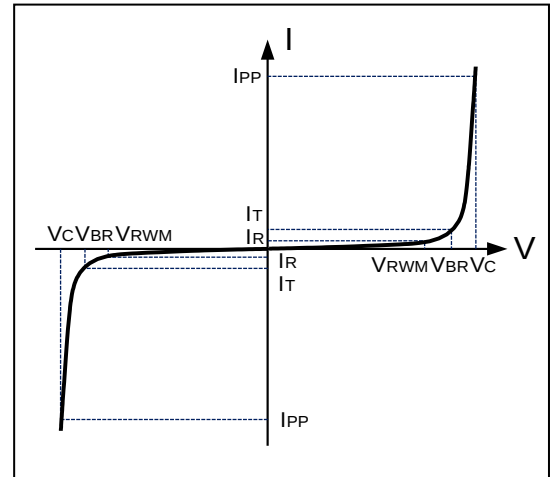
Schematic & PIN Configuration



Absolute Maximum Rating			
Rating	Symbol	Value	Units
Peak Pulse Power ($t_p=8/20\mu s$)	P_{PP}	75	W
Peak Pulse Current ($t_p=8/20\mu s$)	I_{PP}	3	A
Operating Temperature	T_J	-55 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Parameters (T=25°C)

Symbol	Parameter
I_{PP}	Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Reverse Stand-Off Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current



Electrical Characteristics

ES05DGCMS-BH						
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	6			V
Reverse Leakage Current	I_R	$V_{RWM}=5V$, $T=25^\circ C$			500	nA
Clamping Voltage	V_C	$I_{PP}=3A$, $t_p=8/20\mu s$		20	25	V
ESD Clamping Voltage ¹	V_C	$I_{PP}=4A$ $t_p=0.2/100ns$		15.5		V
ESD Clamping Voltage ¹	V_C	$I_{PP}=16A$ $t_p=0.2/100ns$		35		V
Dynamic Resistance ^{1,2}	R_{DYN}	$TLP=0.2/100ns$		1.63		Ω
Junction Capacitance	C_j	$V_R=0V$, $f=1MHz$		0.15	0.23	pF

Note: 1、TLP Setting : $t_p=100ns$, $t_r=0.2ns$, I_{TLP} and V_{TLP} sample window: $t_1=70ns$ to $t_2=90ns$.

2、Dynamic resistance calculated from $I_{PP}=4A$ to $I_{PP}=16A$ using "Best Fit"

Typical Characteristics

Figure 1: Peak Pulse Power Vs Pulse Time

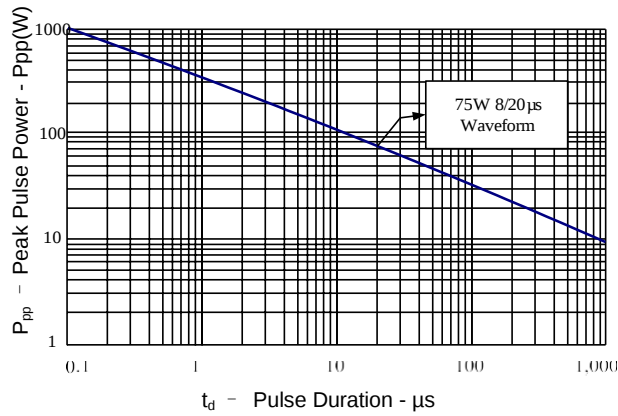


Figure 2: Power Derating Curve

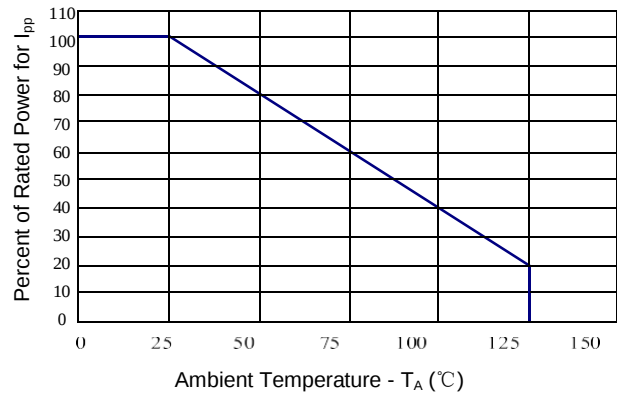


Figure 3: Clamping Voltage vs. Peak Pulse Current

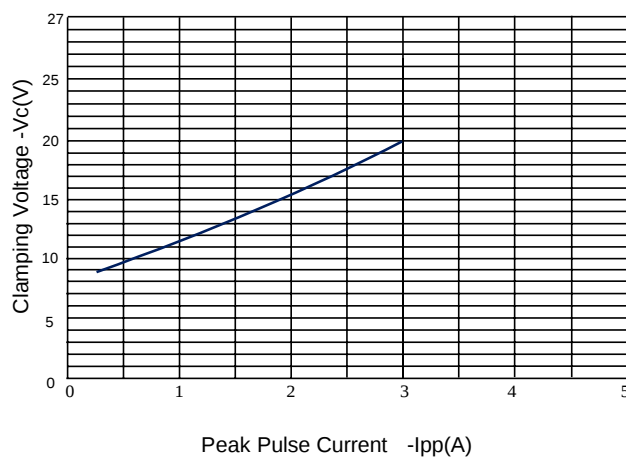


Figure 4: Capacitance vs. Reverse Voltage

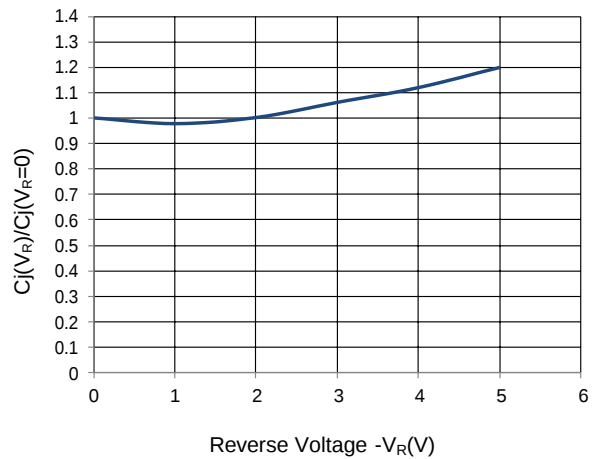


Figure 5: TLP Positive I-V Curve

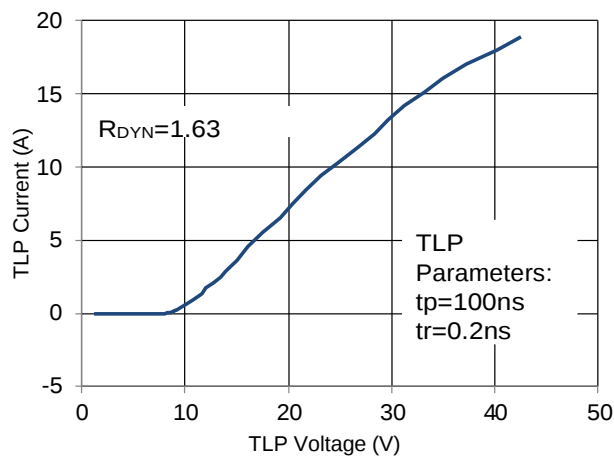
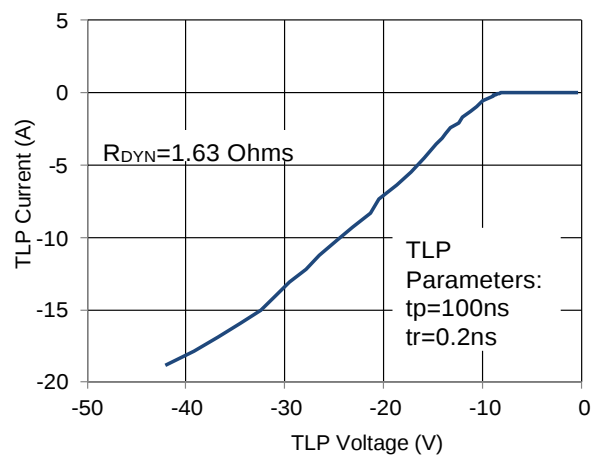
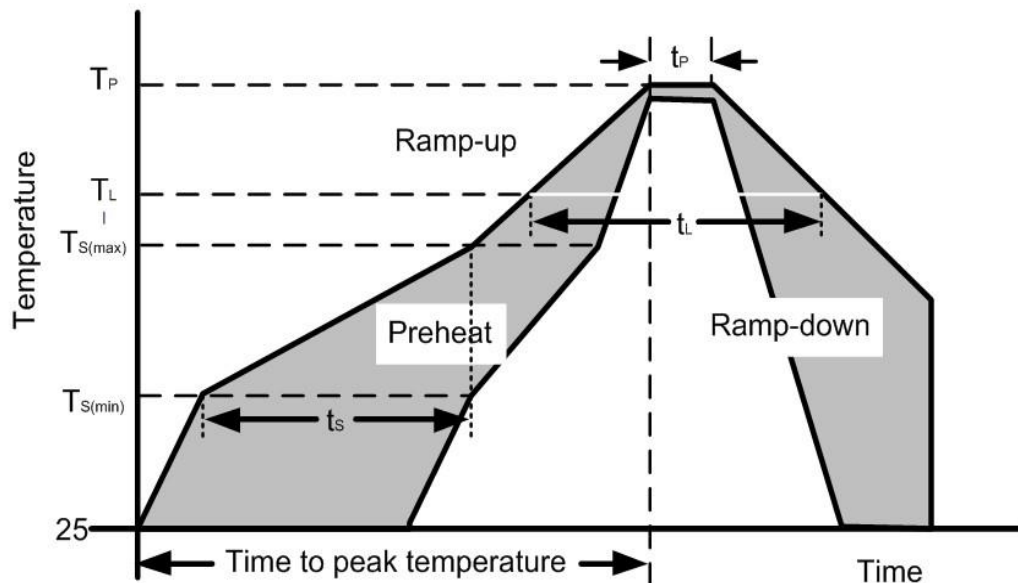


Figure 6: TLP Negative I-V Curve



Soldering Parameters

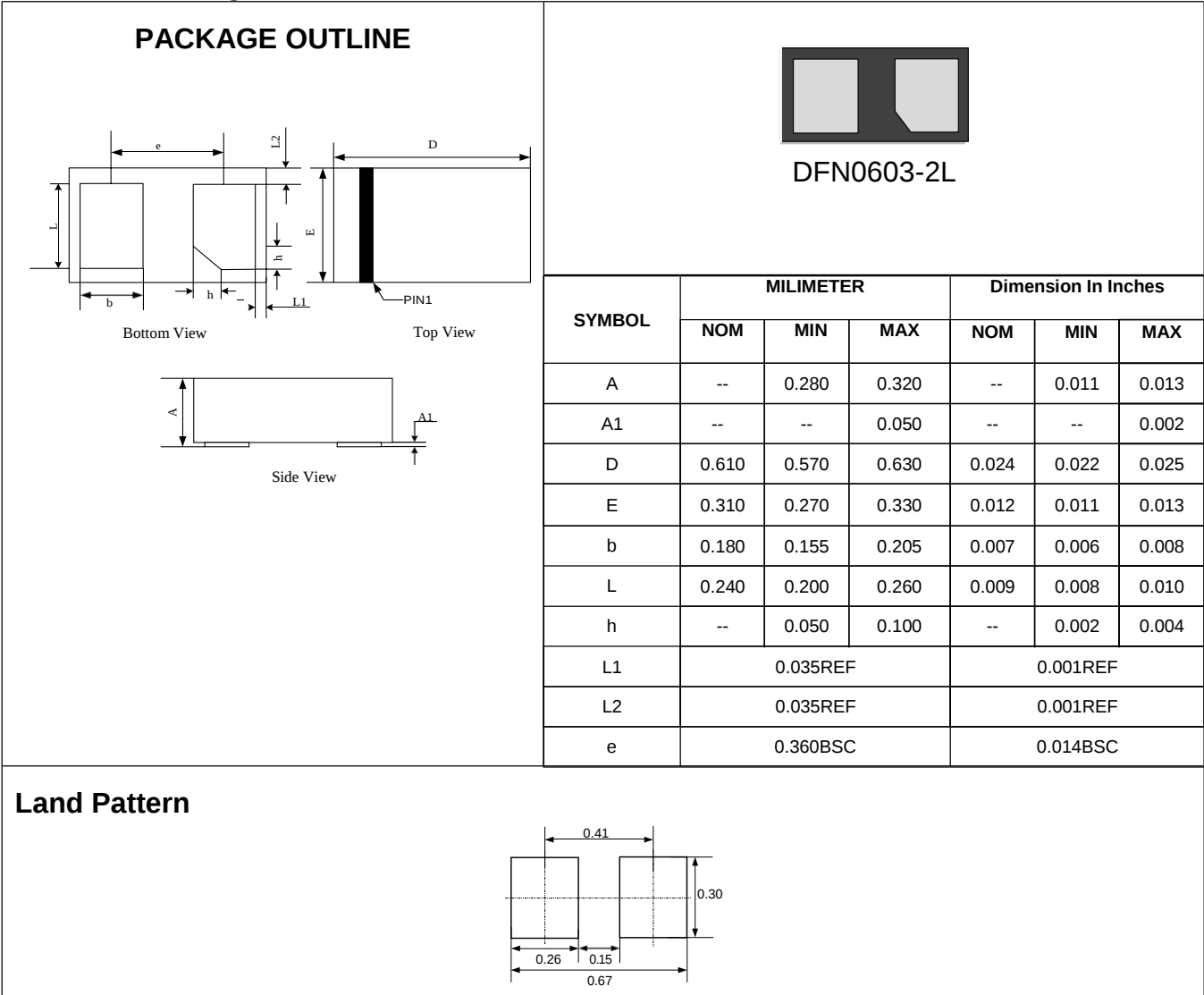
Reflow Condition		Pb – Free assembly
Pre Heat	Temperature Min ($T_{S(min)}$)	150°C
	Temperature Max ($T_{S(max)}$)	200°C
	Time (min to max) (t_s)	60 – 190 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		5°C/second max
$T_{S(max)}$ to T_L —Ramp-up Rate		5°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260+0/-5 °C
Time within actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280°C



Transient Voltage Suppressor

Outline Drawing –DFN0603-2L

ES05DGCMS-BH



Marking Codes

Part Number	Marking Code
ES05DGCMS-BH	Pin1 GΣ G=Specific Device Code M=Month Code

Package Information

Qty: 15k/Reel