H7N0603DL, H7N0603DS

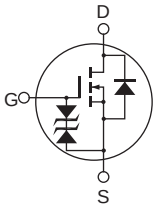
Silicon N Channel MOS FET
High speed power Switching

REJ03G0123-0100Z
Rev.1.00
Oct.14.2003

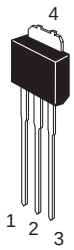
Features

- Low on - resistance
  R_{DS} (on) = 11 mΩ typ.
- Low drive current
- Capable of 4.5 gate drive

Outline

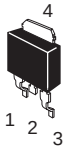


DPAK-2



H7N0603DL

DPAK-S



H7N0603DS

1. Gate
2. Drain
3. Source
4. Drain

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	60	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	30	A
Drain peak current	I_D (pulse) Note1	120	A
Body drain diode reverse drain current	I_{DR}	30	A
Avalanche current	I_{AP} Note3	25	A
Avalanche energy	E_{AR} Note3	53.6	mJ
Channel dissipation	Pch Note2	40	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. Tc = 25°C
3. Tch = 25°C, Rg ≥ 50Ω

Electrical Characteristics

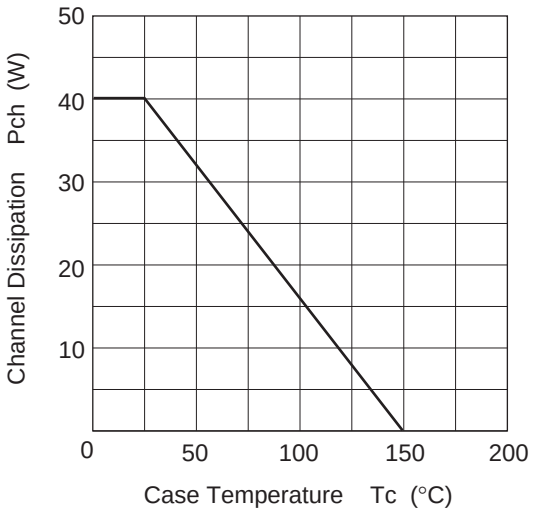
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test condition
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	10	µA	V_{DS} = 60 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.5	—	2.5	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	$R_{DS(on)}$	—	11	15	mΩ	I_D = 15 A, V_{GS} = 10 V[Note1]
		—	16	22	mΩ	I_D = 15 A, V_{GS} = 4.5 V[Note1]
Forward transfer capacitance	$\|y_{fs}\|$	24	40	—	S	I_D = 15 A, V_{DS} = 10 V[Note1]
Input capacitance	Ciss	—	3200	—	pF	V_{DS} = 10 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	385	—	pF	
Reverse transfer capacitance	Crss	—	225	—	pF	
Total gate charge	Qg	—	56	—	nC	V_{DD} = 25 V V_{GS} = 10 V I_D = 30 A
Gate to source charge	Qgs	—	11	—	nC	
Gate to drain charge	Qgd	—	12	—	nC	
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	V_{GS} = 10 V, I_D = 15 A R_L = 2.0 Ω Rg = 4.7 Ω
Rise time	t_r	—	125	—	ns	
Turn-off delay time	$t_{d(off)}$	—	90	—	ns	
fall time	t_f	—	17	—	ns	
Body - drain diode forward voltage	V_{DF}	—	0.9	—	V	I_F = 30 A, V_{GS} = 0[Note1]
Body – drain diode reverse recovery time	t_{rr}	—	30	—	ns	I_F = 30 A, V_{GS} = 0 diF / dt = 100 A / µs

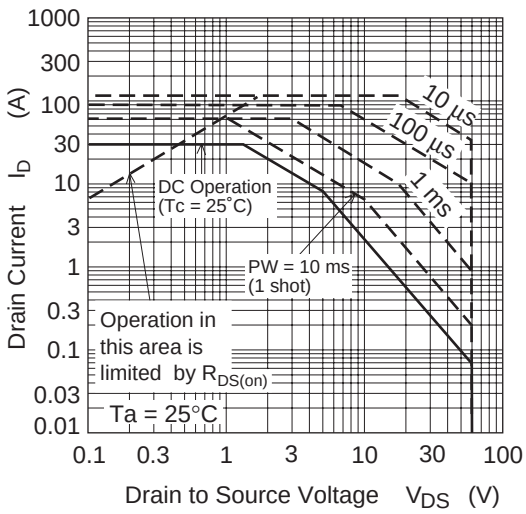
Notes: 1. Pulse Test

Main Characteristics

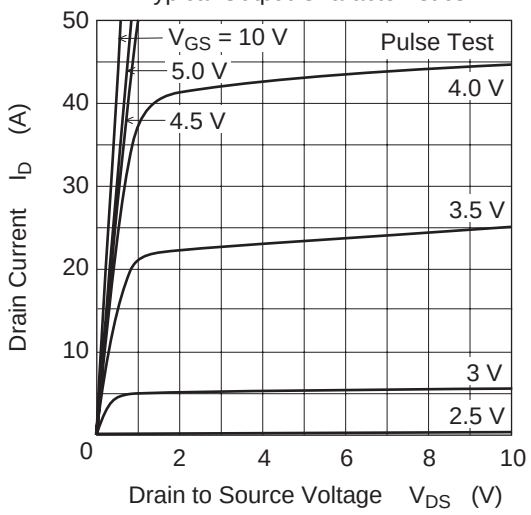
Power vs. Tmperature Derating



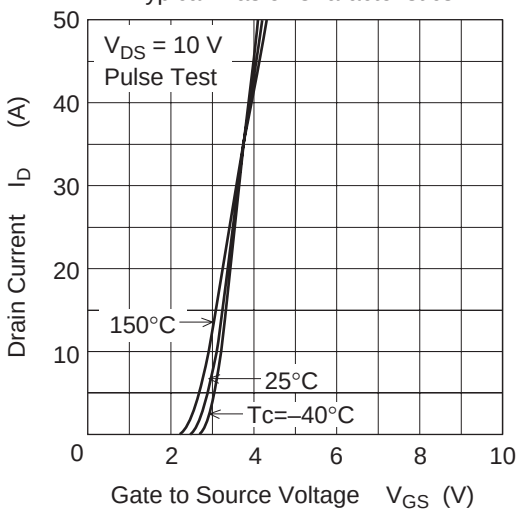
Maximum Safe Operation Area



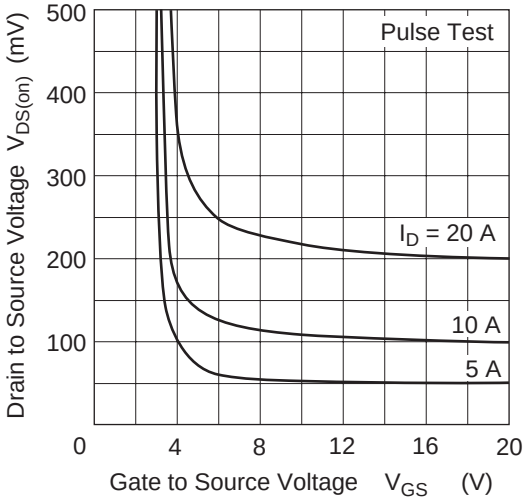
Typical Output Characterristics



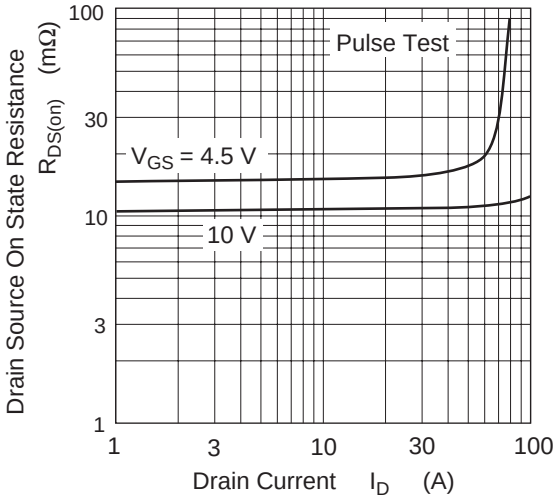
Typical Trasfer Characteristics



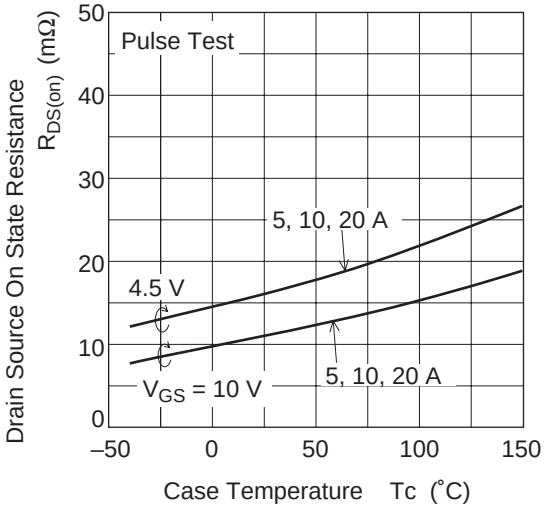
Drain Source Saturation Voltage vs. Gate to Source Voltage



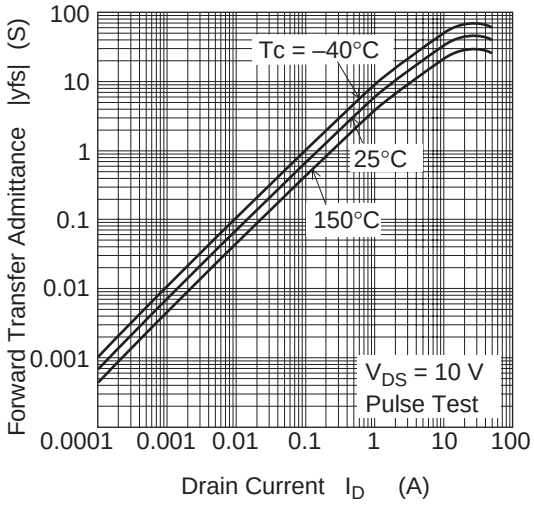
Static Drain to Source State Resistance vs. Drain Current



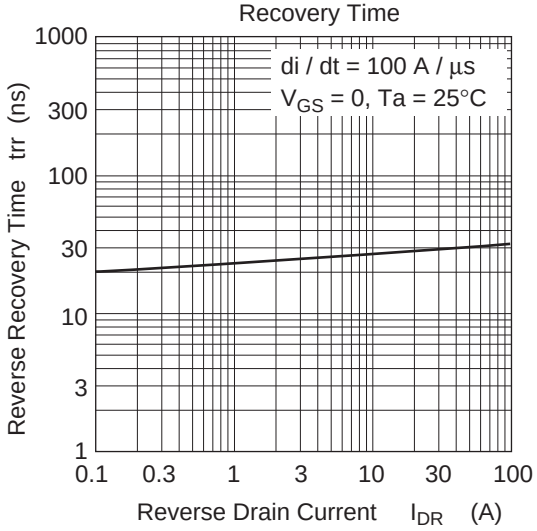
Static Drain to State Resistance vs. Temperature



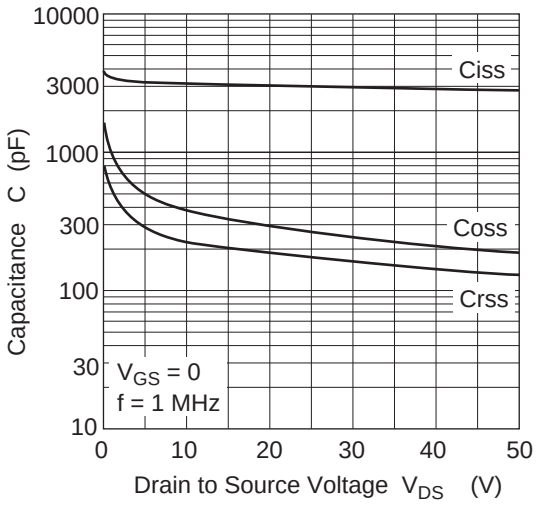
Forward Transfer Admittance vs. Drain Current



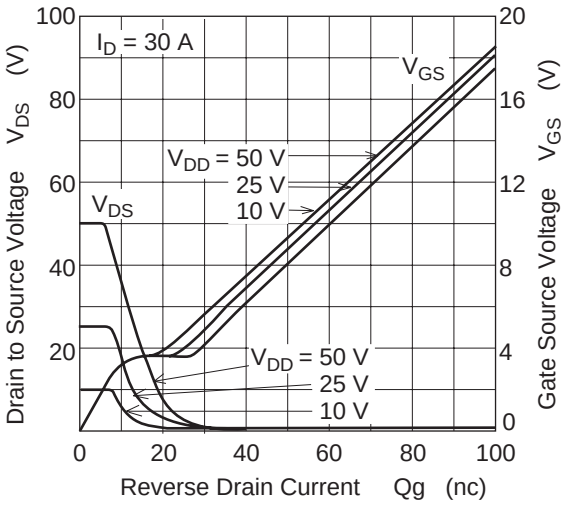
Body-Drain Diode Reverse Recovery Time



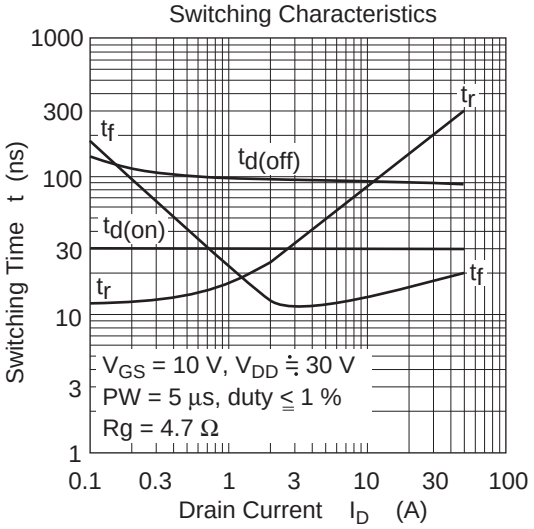
Typical Capacitance vs. Drain to Source Voltage



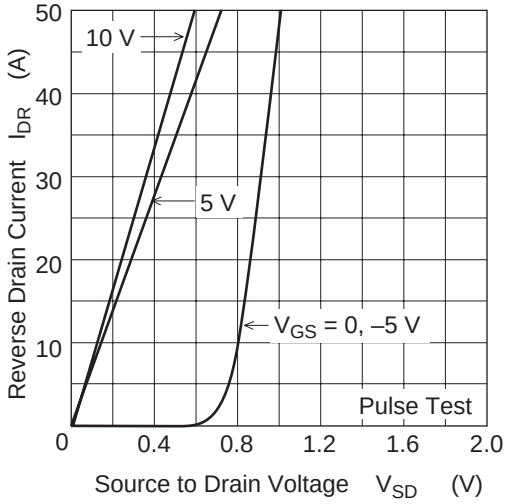
Dynamic Input Characteristics



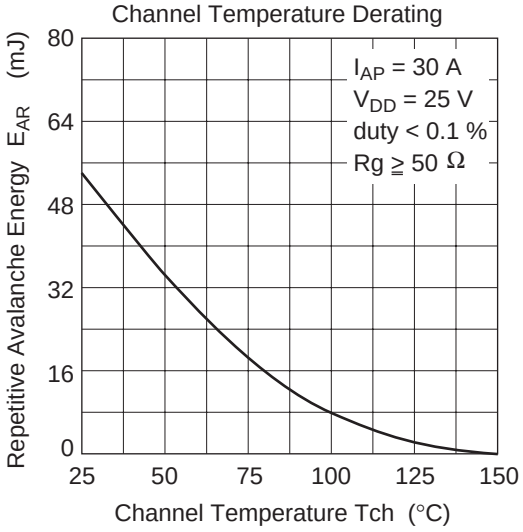
Switching Characteristics



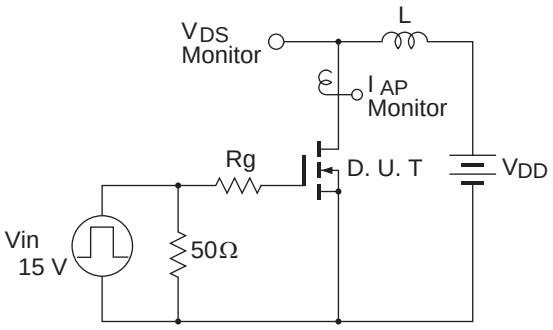
Reverse Drain Current vs.
Source to Drain Voltage



Maximum Avalanche Energy vs.
Channel Temperature Derating

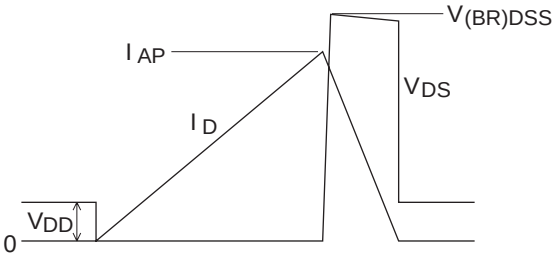


Avalanche Test Circuit

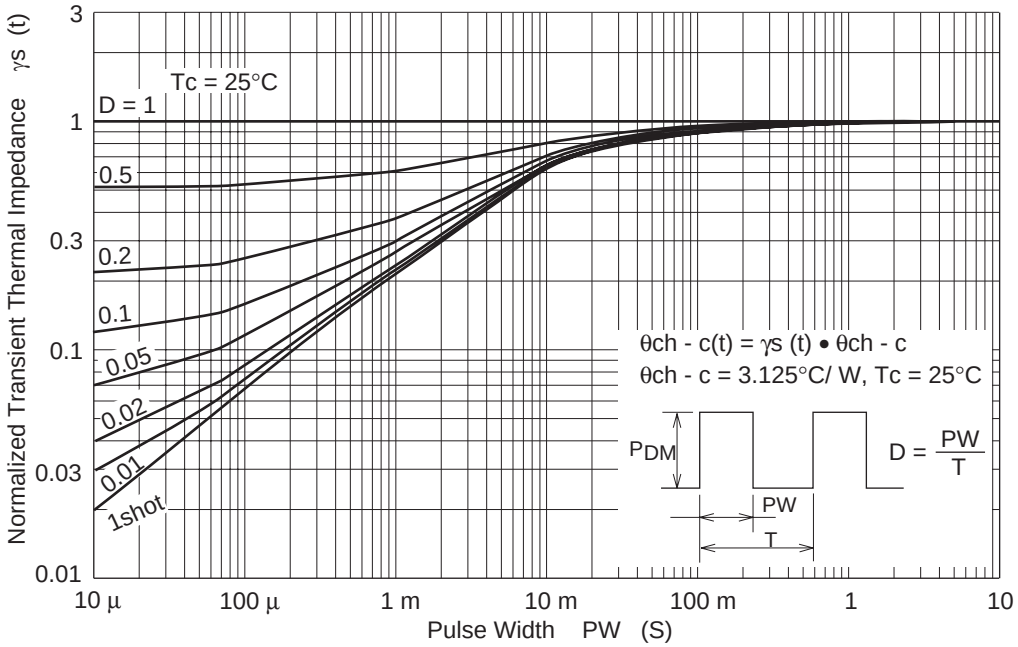


Avalanche Waveform

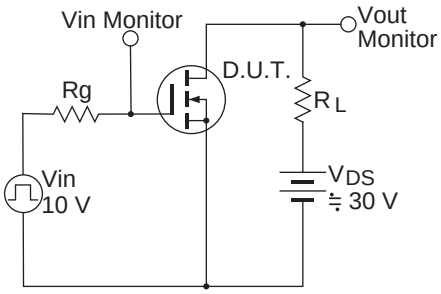
$$E_{AR} = \frac{1}{2} \bullet L \bullet I_{AP}^{2} \bullet \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



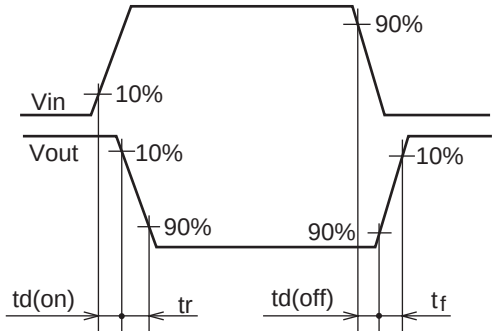
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test circuit



Switching Time Waveform

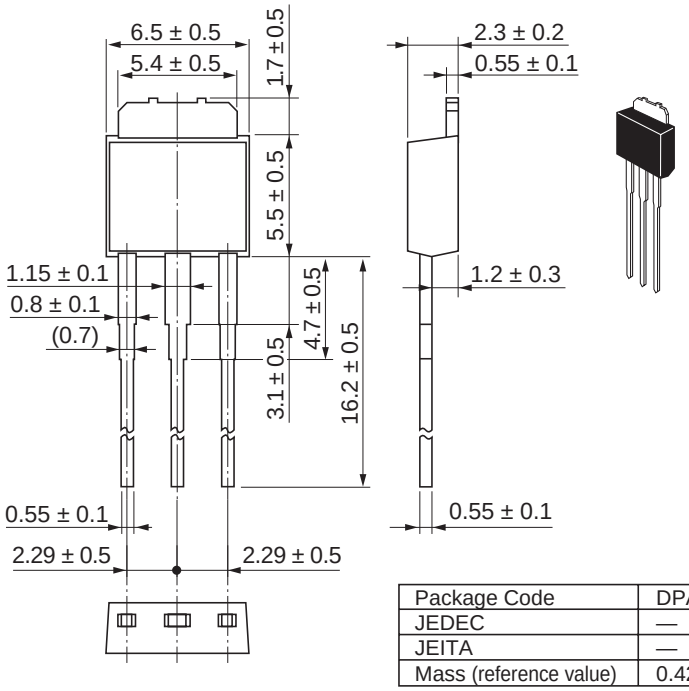


Package Dimensions

• H7N0603DL

As of January, 2003

Unit: mm

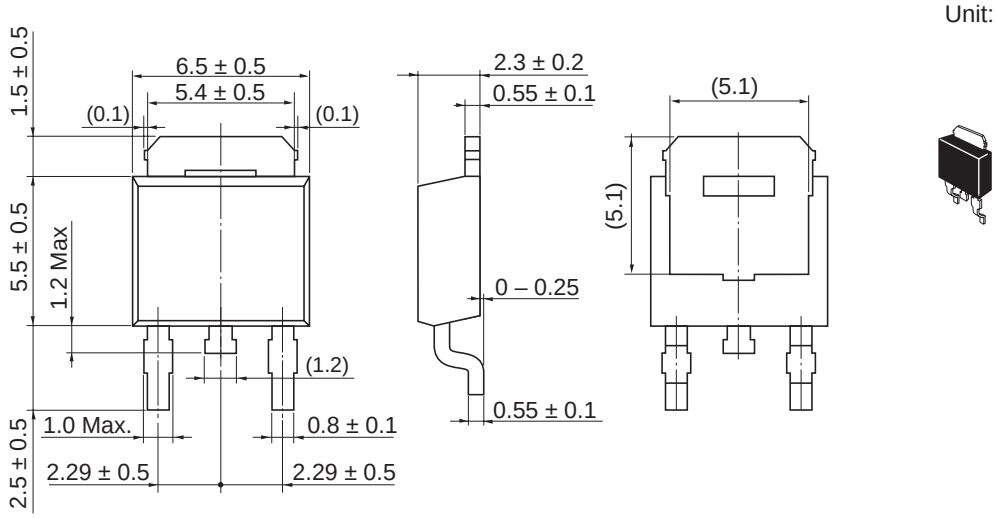


Package Code	DPAK (L)-(2)
JEDEC	—
JEITA	—
Mass (reference value)	0.42 g

• H7N0603DS

As of January, 2003

Unit: mm



Package Code	DPAK (S)
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.28 g

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