

**6 Ω On-Resistance, +12 V, ± 5 V, +5 V, +3 V, SPST and SPDT Switches****DESCRIPTION**

DG417LE, DG418LE, DG419LE analog switches are designed to operate from +3 V to +16 V single supply or ± 3 V to ± 8 V dual supply and are fully specified at +12 V, ± 5 V, +5 V, and +3 V.

The DG417LE, DG418LE, DG419LE are lower voltage pin-for-pin compatible companion devices to the industry standard DG417, DG418, and DG419. Each switch conducts equally well in both directions when on, blocks input voltages up to the supply level when off, and exhibits break before switching action.

Fabricated with advanced CMOS technology, the parts provide low on resistance and fast switching speed with low power dissipation.

The DG417LE, DG418LE, DG419LE operating temperature range is -40 °C to +85 °C and devices are available in 8 lead TSSOP and SOIC packages.

FEATURES

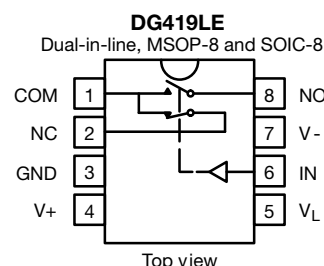
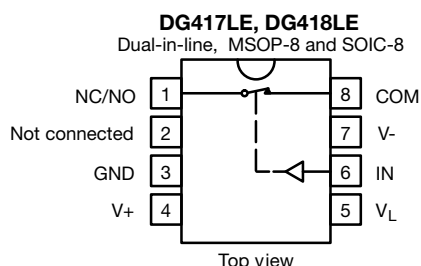
- +3 V to +16 V single supply, or ± 3 V to ± 8 V dual supply
- On resistance: 6 Ω for DG417LE, DG418LE
11 Ω for DG419LE
- Fast switching speeds: $t_{ON} = 20$ ns, $t_{OFF} = 15$ ns
- Break-before-make switching for DG419LE
- Fully specified at +12 V, ± 5 V, +5 V, and +3 V
- V+ to V- analog signal range
- CMOS / TTL compatible
- Control logic input can be over V+
- 8 pin TSSOP and 8 pin SOIC packages
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

**Note**

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

APPLICATIONS

- Data acquisition systems
- Medical instruments
- Precision instruments
- Communications systems
- Automated test equipment
- Sample and hold circuit
- Audio and video signal routing

FUNCTIONAL BLOCK DIAGRAM AND PIN CONFIGURATION**TRUTH TABLE (DG417LE, DG418LE)**

| LOGIC | DG417LE | DG418LE |
|-------|---------|---------|
| 0 | On | Off |
| 1 | Off | On |

ORDERING INFORMATION (DG417LE, DG418LE)

| TEMP. RANGE | PACKAGE | PART NUMBER |
|------------------|-------------------|------------------|
| -40 °C to +85 °C | 8-pin narrow SOIC | DG417LEDY-T1-GE4 |
| | | DG418LEDY-T1-GE4 |
| | 8-pin MSOP | DG417LEDQ-T1-GE3 |
| | | DG418LEDQ-T1-GE3 |

TRUTH TABLE (DG419LE)

| LOGIC | NC | NO |
|-------|-----|-----|
| 0 | On | Off |
| 1 | Off | On |

ORDERING INFORMATION (DG419LE)

| TEMP. RANGE | PACKAGE | PART NUMBER |
|------------------|-------------------|------------------|
| -40 °C to +85 °C | 8-pin narrow SOIC | DG419LEDY-T1-GE4 |
| | 8-pin MSOP | DG419LEDQ-T1-GE3 |



| ABSOLUTE MAXIMUM RATINGS | | | |
|---|-------------------------|--|------|
| PARAMETER | | LIMIT | UNIT |
| V+, V _L , I _N reference to V- | | -0.3 to 18 | V |
| V+ reference to GND | | -0.3 to 18 | |
| GND reference to V- | | -0.3 to 18 | |
| COM, NC, NO reference to V- ^a | | -0.3 to (V+ + 0.3) or 30 mA, whichever occurs first | |
| Continuous current (any terminal) | | 30 | mA |
| Peak current, S or D (pulsed 1 ms, 10 % duty cycle) | | 100 | |
| Storage temperature | (DQ, DY suffix) | -65 to +150 | °C |
| Power dissipation (packages) ^b | 8-pin MSOP ^c | 320 | mW |
| | 8-pin SOIC ^c | 400 | |
| ESD / HBM | JS-001 | 2000 | V |
| ESD / CDM | JS-002 | 2000 | |
| Latch up | JESD78 | 300 | mA |

Notes

- a. Signals on NC, NO, or COM exceeding V+ or V- will be clamped by internal diodes. Limit forward diode current to maximum current ratings
- b. All leads welded or soldered to PC board
- c. Derate 6.5 mW/°C above 25 °C

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



| SPECIFICATIONS (Single supply 12 V) | | | | | | | | |
|---|--|---|--------------------|-------------------|-------------------------------------|-------------------|------|--|
| PARAMETER | SYMBOL | TEST CONDITIONS UNLESS OTHERWISE SPECIFIED V ₊ = 12 V, V ₋ = 0 V V _L = 5 V, V _{IN} = 2.4 V, 0.8 V ^f | TEMP. ^b | TYP. ^c | D SUFFIX LIMITS -40 °C to +85 °C | | UNIT | |
| | | | | | MIN. ^d | MAX. ^d | | |
| Analog Switch | | | | | | | | |
| Analog signal range ^e | V _{ANALOG} | | Full | - | 0 | 12 | V | |
| Drain-source on-resistance | R _{DS(on)} | V ₊ = 10.8 V, V ₋ = 0 V I _{NO} , I _{NC} = 5 mA, V _{COM} = 2 V / 9 V, DG417LE, DG418LE only | Room | 6 | - | 7 | Ω | |
| | | | Full | - | - | 9 | | |
| | | V ₊ = 10.8 V, V ₋ = 0 V I _{NO} , I _{NC} = 5 mA, V _{COM} = 2 V / 9 V, DG419LE only | Room | 11 | - | 14 | | |
| | | | Full | - | - | 18 | | |
| Switch off leakage current | I _{NO(off)} I _{NC(off)} | V _{COM} = 1 V / 11 V V _{NO} , V _{NC} = 11 V / 1 V | Room | ± 0.002 | -2 | 2 | nA | |
| | I _{COM(off)} | | Full | - | -10 | 10 | | |
| | | | Room | ± 0.003 | -2 | 2 | | |
| | | | | Full | - | -10 | | |
| Switch on leakage current | I _{COM(on)} | V _{NO} , V _{NC} = V _{COM} = 11 V / 1 V | Room | ± 0.006 | -2 | 2 | | |
| | | | Full | - | -10 | 10 | | |
| Digital Control | | | | | | | | |
| Input current | I _{INL} or I _{INH} | | Full | 0.02 | -1 | 1 | μA | |
| Dynamic Characteristics | | | | | | | | |
| Turn-on time | t _{ON} | R _L = 300 Ω, C _L = 35 pF V _{NO} , V _{NC} = 5 V | Room | 20 | - | 38 | ns | |
| Turn-off time | t _{OFF} | | Full | - | - | 40 | | |
| | | | Room | 15 | - | 32 | | |
| | | | Full | - | - | 35 | | |
| Break-before-make time | t _{BBM} | DG419LE only, V _{NC} , V _{NO} = 5 V R _L = 300 Ω, C _L = 35 pF | Room | 7 | - | - | | |
| Charge injection ^e | Q _{INJ} | V _{GEN} = 0 V, R _{GEN} = 0 Ω, C _L = 1 nF | Room | 26 | - | - | pC | |
| Off-isolation ^e | OIRR | R _L = 50 Ω, C _L = 5 pF, f = 1 MHz | Room | -68 | - | - | dB | |
| Channel-to-channel crosstalk ^e | X _{TALK} | | Room | -72 | - | - | | |
| Source off capacitance ^e | C _{NO(off)} C _{NC(off)} | V _{IN} = 0 V or V ₊ , f = 1 MHz, DG417LE,DG418LE only | Room | 11 | - | - | pF | |
| Drain-on capacitance ^e | C _{ON} | | Room | 32 | - | - | | |
| Source off capacitance ^e | C _{NO(off)} C _{NC(off)} | V _{IN} = 0 V or V ₊ , f = 1 MHz, DG419LE only | Room | 6 | - | - | | |
| Drain-on capacitance ^e | C _{ON} | | Room | 20 | - | - | | |
| Power Supplies | | | | | | | | |
| Positive supply current | I ₊ | V _{IN} = 0 V or V _L | Room | 0.00009 | - | 1 | μA | |
| | | | Full | - | - | 5 | | |
| Negative supply current | I ₋ | | Room | -0.00009 | -1 | - | | |
| | | | Full | - | -5 | - | | |
| Logic supply current | I _L | | Room | 0.00002 | - | 1 | | |
| | | | Full | - | - | 5 | | |
| Ground current | I _{GND} | | Room | -0.00002 | -1 | - | | |
| | | | Full | - | -5 | - | | |



| SPECIFICATIONS (Dual supply ± 5 V) | | | | | | | |
|------------------------------------|----------------------|--|---------|----------|-------------------------------------|--------|------|
| PARAMETER | SYMBOL | TEST CONDITIONS UNLESS OTHERWISE SPECIFIED V+ = 5 V, V- = -5 V VL = 5 V, VIN = 2.4 V, 0.8 V f | TEMP. b | TYP. c | D SUFFIX LIMITS -40 °C to +85 °C | | UNIT |
| | | | | | MIN. d | MAX. d | |
| Analog Switch | | | | | | | |
| Analog signal range e | VANALOG | | Full | - | -5 | 5 | V |
| Drain-source on-resistance | RDS(on) | V+ = 5 V, V- = -5 V INO, INC = 5 mA, VCOM = ± 3.5 V DG417LE / DG418LE only | Room | 6 | - | 8 | Ω |
| | | | Full | - | - | 10 | |
| | | V+ = 5 V, V- = -5 V INO, INC = 5 mA, VCOM = ± 3.5 V DG419LE only | Room | 12 | - | 15 | |
| | | | Full | - | - | 21 | |
| Switch off leakage current a | INO(off) INC(off) | V+ = 5.5 V, V- = -5.5 V VCOM = ± 4.5 V VNO, VNC = ± 4.5 V | Room | ± 0.001 | -2 | 2 | nA |
| | | | Full | - | -10 | 10 | |
| | ICOM(off) | | Room | ± 0.002 | -2 | 2 | |
| | | | Full | - | -10 | 10 | |
| Channel on leakage current a | ICOM(on) | V+ = 5.5 V, V- = -5.5 V VNO, VNC = VCOM = ± 4.5 V | Room | ± 0.003 | -2 | 2 | |
| | | | Full | - | -10 | 10 | |
| Digital Control | | | | | | | |
| Input current a | IINL or IINH | | Full | 0.02 | -1 | 1 | μA |
| Dynamic Characteristics | | | | | | | |
| Turn-on time e | tON | RL = 300 Ω, CL = 35 pF VNO, VNC = ± 3.5 V | Room | 21 | - | 38 | ns |
| | | | Full | - | - | 40 | |
| Turn-off time e | tOFF | | Room | 20 | - | 45 | |
| | | | Full | - | - | 50 | |
| Break-before-make time e | tBBM | DG419LE only, VNO, VNC = 3.5 V RL = 300 Ω, CL = 35 pF | Room | 7 | - | - | |
| Transition time | tTRANS | RL = 300 Ω, CL = 35 pF VS1 = ± 3.5 V, VS2 = ± 3.5 V | Room | 21 | - | - | |
| Charge injection e | QINJ | VGEN = 0 V, RGEN = 0 Ω, CL = 1 nF | Room | -17 | - | - | pC |
| Off-isolation e | OIRR | RL = 50 Ω, CL = 5 pF, f = 1 MHz | Room | -69 | - | - | dB |
| Channel-to-channel crosstalk e | XTALK | | Room | -73 | - | - | |
| Source off capacitance e | CNO(off) CNC(off) | VIN = 0 V or V+, f = 1 MHz DG417LE / DG418LE only | Room | 11 | - | - | pF |
| Drain-on capacitance e | CON | | Room | 33 | - | - | |
| Source off capacitance e | CNO(off) CNC(off) | VIN = 0 V or V+, f = 1 MHz DG419LE only | Room | 6 | - | - | |
| Drain-on capacitance e | CON | | Room | 20 | - | - | |
| Power Supplies | | | | | | | |
| Positive supply current e | I+ | VIN = 0 V or VL | Room | 0.00007 | - | 1 | μA |
| | | | Full | - | - | 5 | |
| Negative supply current e | I- | | Room | -0.00009 | -1 | - | |
| | | | Full | - | -5 | - | |
| Logic supply current e | IL | | Room | 0.00002 | - | 1 | |
| | | | Full | - | - | 5 | |
| Ground current e | IGND | | Room | -0.00003 | -1 | - | |
| | | | Full | - | -5 | - | |



| SPECIFICATIONS (Single supply 5 V) | | | | | | | |
|---|--|--|--------------------|-------------------|-------------------------------------|-------------------|------|
| PARAMETER | SYMBOL | TEST CONDITIONS UNLESS OTHERWISE SPECIFIED V ₊ = 5 V, V ₋ = 0 V V _L = 5 V, V _{IN} = 2.4 V, 0.8 V ^f | TEMP. ^b | TYP. ^c | D SUFFIX LIMITS -40 °C to +85 °C | | UNIT |
| | | | | | MIN. ^d | MAX. ^d | |
| Analog Switch | | | | | | | |
| Analog signal range ^e | V _{ANALOG} | | Full | - | 0 | 5 | V |
| Drain-source on-resistance ^e | R _{DS(on)} | V ₊ = 4.5 V, I _{NO} , I _{NC} = 5 mA V _{COM} = 1 V, 3.5 V DG417LE / DG418LE only | Room | 12 | - | 16 | Ω |
| | | | Full | - | - | 18 | |
| | | V ₊ = 4.5 V, I _{NO} , I _{NC} = 5 mA V _{COM} = 1 V, 3.5 V DG419LE only | Room | 24 | - | 35 | |
| | | | Full | - | - | 37 | |
| Switch off leakage current ^a | I _{NO(off)} I _{NC(off)} | V ₊ = 5.5 V, V ₋ = 0 V V _{COM} = 1 V / 4.5 V V _{NO} , V _{NC} = 4.5 V / 1 V | Room | ± 0.002 | -1 | 1 | nA |
| | I _{COM(off)} | | Full | - | -10 | 10 | |
| | | | Room | ± 0.001 | -1 | 1 | |
| | | | Full | - | -10 | 10 | |
| Switch on leakage current ^a | I _{COM(on)} | V ₊ = 5.5 V, V ₋ = 0 V V _{NO} , V _{NC} = V _{COM} = 1 V / 4.5 V | Room | ± 0.003 | -1 | 1 | |
| | | | Full | - | -10 | 10 | |
| Digital Control | | | | | | | |
| Input current ^a | I _{INL} or I _{INH} | | Full | 0.02 | -1 | 1 | μA |
| Dynamic Characteristics | | | | | | | |
| Turn-on time ^e | t _{ON} | R _L = 300 Ω, C _L = 35 pF V _{NO} , V _{NC} = 3.5 V | Room | 29 | - | 46 | ns |
| | | | Full | - | - | 49 | |
| Turn-off time ^e | t _{OFF} | | Room | 16 | - | 28 | |
| | | | Full | - | - | 32 | |
| Break-before-make time ^e | t _{BBM} | DG419LE only, V _{NO} , V _{NC} = 3.5 V R _L = 300 Ω, C _L = 35 pF | Room | 16 | - | - | |
| Charge injection ^e | Q _{INJ} | V _{GEN} = 0 V, R _{GEN} = 0 Ω, C _L = 1 nF | Room | 10 | - | - | pC |
| Off-isolation ^e | OIRR | R _L = 50 Ω, C _L = 5 pF, f = 1 MHz | Room | -68 | - | - | dB |
| Channel-to-channel crosstalk ^e | X _{TALK} | | Room | -72 | - | - | |
| Source off capacitance ^e | C _{NO(off)} C _{NC(off)} | V _{IN} = 0 V or V ₊ , f = 1 MHz DG417LE / DG418LE only | Room | 13 | - | - | pF |
| Drain-on capacitance ^e | C _{ON} | | Room | 34 | - | - | |
| Source off capacitance ^e | C _{NO(off)} C _{NC(off)} | V _{IN} = 0 V or V ₊ , f = 1 MHz DG419LE only | Room | 7 | - | - | |
| Drain-on capacitance ^e | C _{ON} | | Room | 22 | - | - | |
| Power Supplies | | | | | | | |
| Positive supply current ^e | I ₊ | V _{IN} = 0 V or V _L | Room | 0.00006 | - | 1 | μA |
| | | | Full | - | - | 5 | |
| Negative supply current ^e | I ₋ | | Room | -0.00006 | -1 | - | |
| | | | Full | - | -5 | - | |
| Logic supply current ^e | I _L | | Room | 0.00002 | - | 1 | |
| | | | Full | - | - | 5 | |
| Ground current ^e | I _{GND} | | Room | -0.00002 | -1 | - | |
| | | | Full | - | -5 | - | |



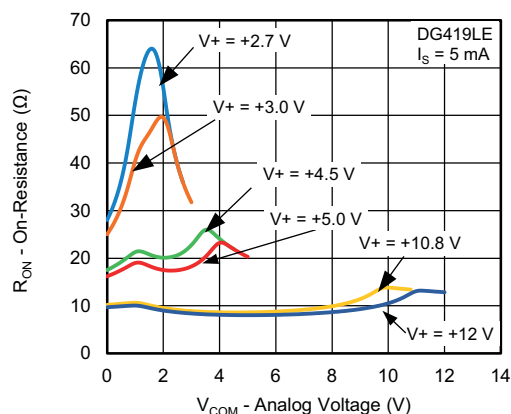
| SPECIFICATIONS (Single supply 3 V) | | | | | | | |
|---|--|---|--------------------|-------------------|-------------------------------------|-------------------|------|
| PARAMETER | SYMBOL | TEST CONDITIONS UNLESS OTHERWISE SPECIFIED V ₊ = 3 V, V ₋ = 0 V V _L = 3 V, V _{IN} = 2 V, 0.4 V ^f | TEMP. ^b | TYP. ^c | D SUFFIX LIMITS -40 °C to +85 °C | | UNIT |
| | | | | | MIN. ^d | MAX. ^d | |
| Analog Switch | | | | | | | |
| Analog signal range ^e | V _{ANALOG} | | Full | - | 0 | 3 | V |
| Drain-source on-resistance | R _{DS(on)} | V ₊ = 2.7 V, V ₋ = 0 V I _{NO} , I _{NC} = 5 mA, V _{COM} = 0.5 V, 2.2 V DG417LE / DG418LE only | Room | 22 | - | 34 | Ω |
| | | | Full | - | - | 38 | |
| | | V ₊ = 2.7 V, V ₋ = 0 V I _{NO} , I _{NC} = 5 mA, V _{COM} = 0.5 V, 2.2 V DG419LE only | Room | 43 | - | 68 | |
| | | | Full | - | - | 75 | |
| Switch off leakage current ^a | I _{NO(off)} I _{NC(off)} | V ₊ = 3.3 V, V ₋ = 0 V V _{COM} = 1 V, 2 V, V _{NO} , V _{NC} = 2 V, 1 V | Room | ± 0.002 | -1 | 1 | nA |
| | | | Full | - | -10 | 10 | |
| | I _{COM(off)} | | Room | ± 0.001 | -1 | 1 | |
| | | | Full | - | -10 | 10 | |
| Channel on leakage current ^a | I _{COM(on)} | V ₊ = 3.3 V, V ₋ = 0 V V _{NO} , V _{NC} = V _{COM} = 1 V, 2 V | Room | ± 0.002 | -1 | 1 | nA |
| | | | Full | - | -10 | 10 | |
| Digital Control | | | | | | | |
| Input current ^a | I _{INL} or I _{INH} | | Full | 0.02 | -1 | 1 | μA |
| Dynamic Characteristics | | | | | | | |
| Turn-on time | t _{ON} | R _L = 300 Ω, C _L = 35 pF V _{NO} , V _{NC} = 1.5 V | Room | 59 | - | 77 | ns |
| Turn-off time | t _{OFF} | | Full | - | - | 81 | |
| | | | Room | 33 | - | 54 | |
| | | | Full | - | - | 69 | |
| Break-before-make time ^e | t _{BBM} | DG419LE only, V _{NO} , V _{NC} = 1.5 V R _L = 300 Ω, C _L = 35 pF | Room | 31 | - | - | |
| Charge injection ^e | Q _{INJ} | V _{GEN} = 0 V, R _{GEN} = 0 Ω, C _L = 10 nF | Room | 6 | - | - | pC |
| Off-isolation ^e | OIRR | R _L = 50 Ω, C _L = 5 pF, f = 1 MHz | Room | -68 | - | - | dB |
| Channel-to-channel crosstalk ^e | X _{TALK} | | Room | -71 | - | - | |
| Source off capacitance ^e | C _{NO(off)} C _{NC(off)} | V _{IN} = 0 V or V ₊ , f = 1 MHz DG417LE / DG418LE only | Room | 14 | - | - | pF |
| Channel on capacitance ^e | C _{D(on)} | | Room | 35 | - | - | |
| Source off capacitance ^e | C _{NO(off)} C _{NC(off)} | V _{IN} = 0 V or V ₊ , f = 1 MHz DG419LE only | Room | 8 | - | - | |
| Channel on capacitance ^e | C _{D(on)} | | Room | 23 | - | - | |
| Power Supplies | | | | | | | |
| Positive supply current ^e | I ₊ | V _{IN} = 0 V or V _L | Room | 0.00005 | - | 1 | μA |
| Negative supply current ^e | I ₋ | | Full | - | - | 5 | |
| | | | Room | -0.00007 | -1 | - | |
| Logic supply current ^e | I _L | | Full | - | -5 | - | |
| | | | Room | 0.00002 | - | 1 | |
| Ground current ^e | I _{GND} | | Full | - | - | 5 | |
| | | | Room | -0.00002 | -1 | - | |
| | | | Full | - | -5 | - | |

Notes

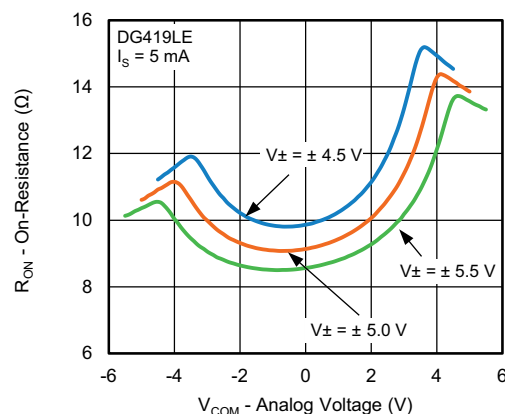
- Leakage parameters are guaranteed by worst case test condition and not subject to production test
- Room = 25 °C, full = as determined by the operating temperature suffix
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing
- The algebraic convention whereby the most negative value is a minimum and the most positive a maximum, is used in this datasheet
- Guaranteed by design, not subject to production test
- V_{IN} = input voltage to perform proper function



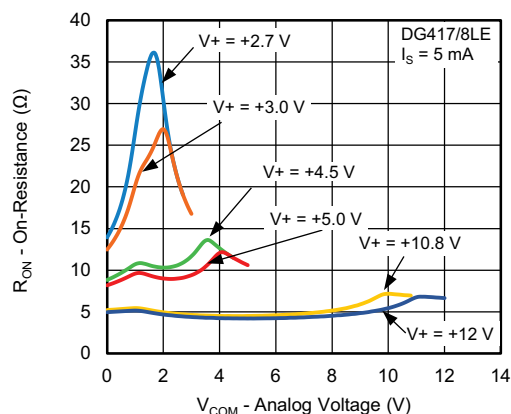
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



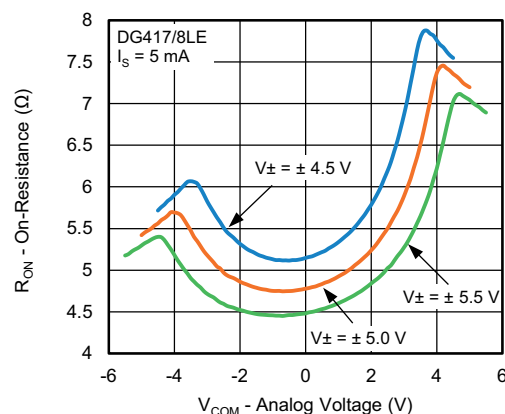
$R_{DS(on)}$ vs. V_{COM} and Supply Voltage



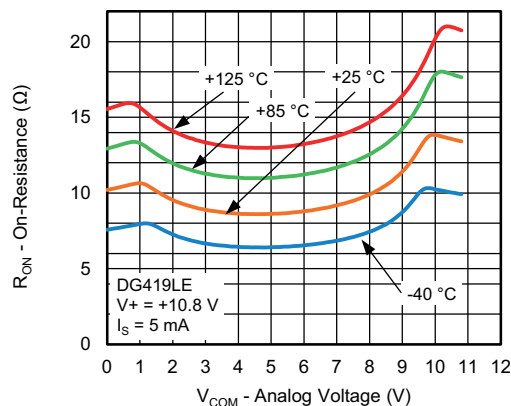
$R_{DS(on)}$ vs. V_{COM} and Supply Voltage



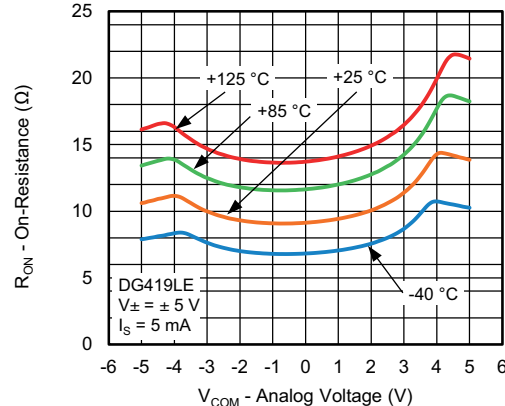
$R_{DS(on)}$ vs. V_{COM} and Supply Voltage



$R_{DS(on)}$ vs. V_{COM} and Supply Voltage



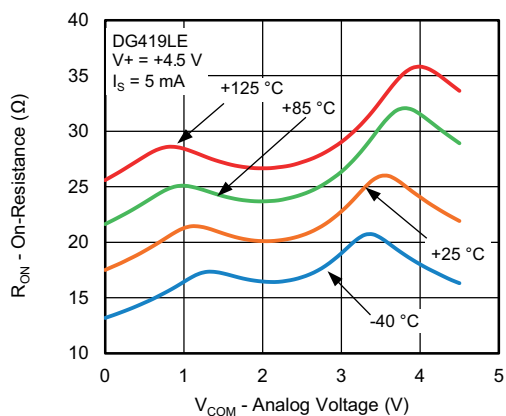
$R_{DS(on)}$ vs. Analog Voltage and Temperature



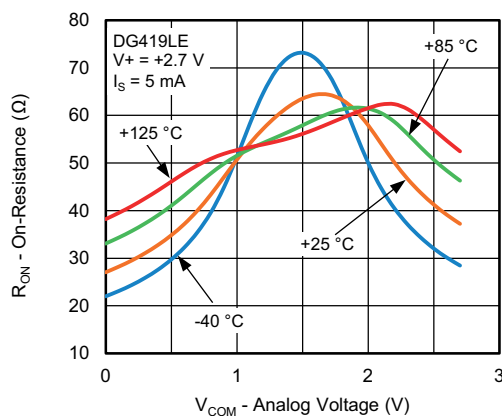
$R_{DS(on)}$ vs. Analog Voltage and Temperature



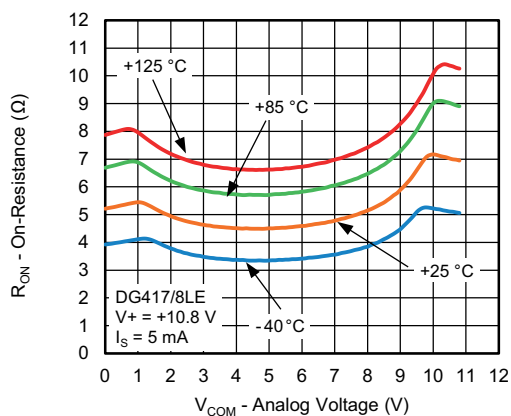
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



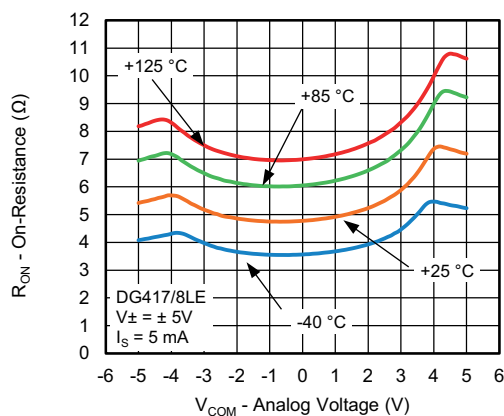
R_{DS(on)} vs. Analog Voltage and Temperature



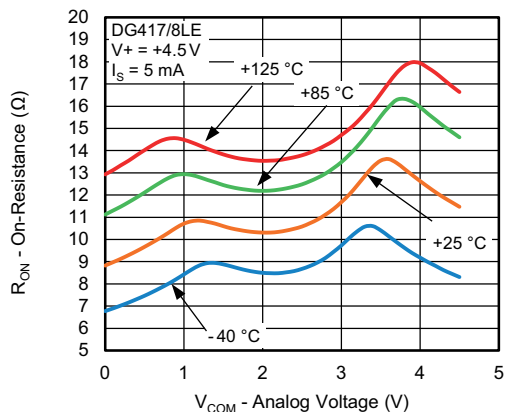
R_{DS(on)} vs. Analog Voltage and Temperature



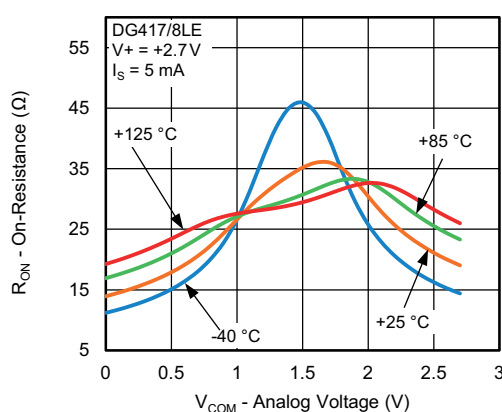
R_{DS(on)} vs. Analog Voltage and Temperature



R_{DS(on)} vs. Analog Voltage and Temperature



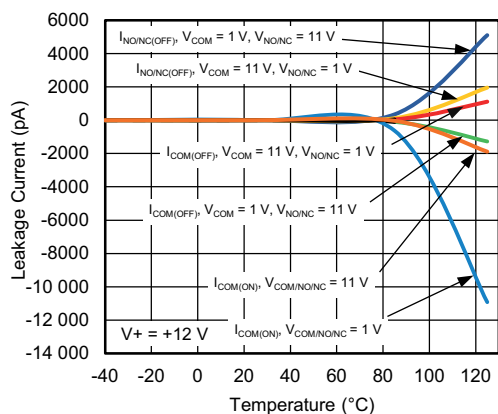
R_{DS(on)} vs. Analog Voltage and Temperature



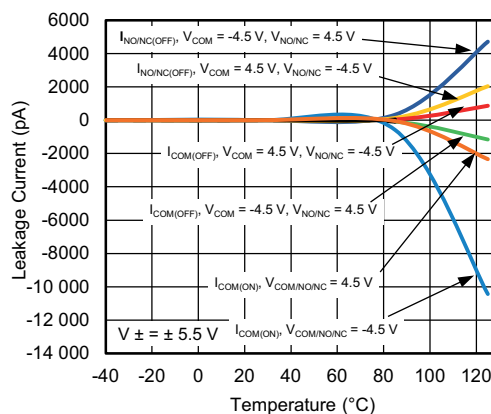
R_{DS(on)} vs. Analog Voltage and Temperature



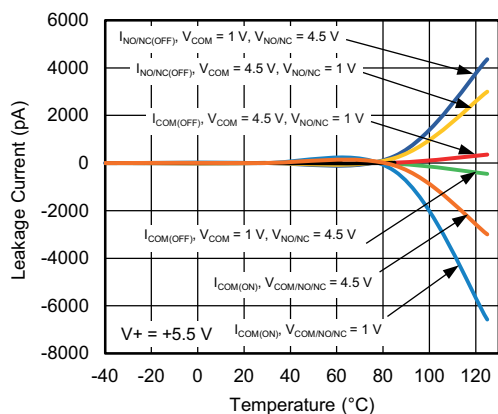
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



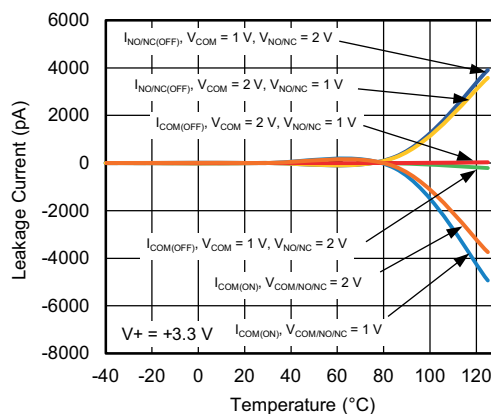
Leakage Current vs. Temperature



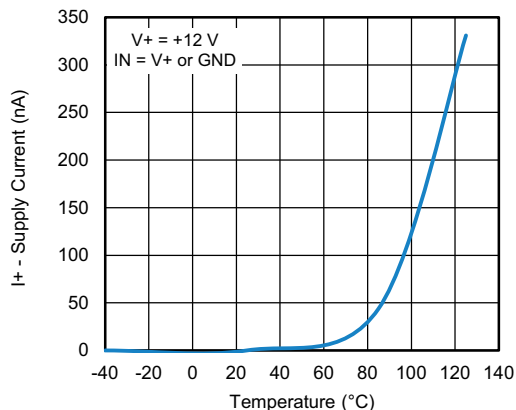
Leakage Current vs. Temperature



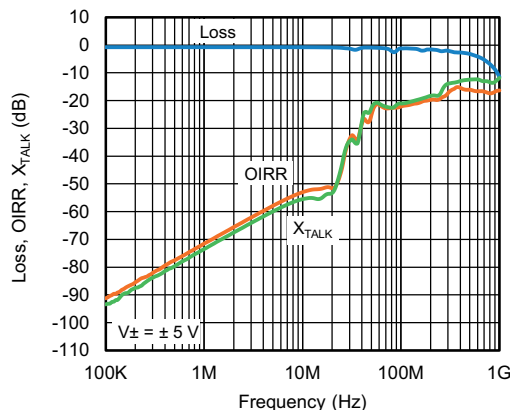
Leakage Current vs. Temperature



Leakage Current vs. Temperature



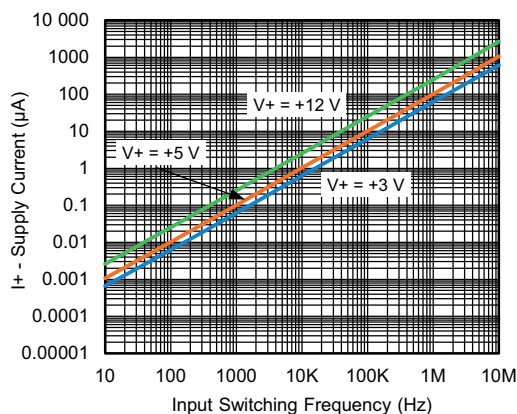
Supply Current vs. Temperature



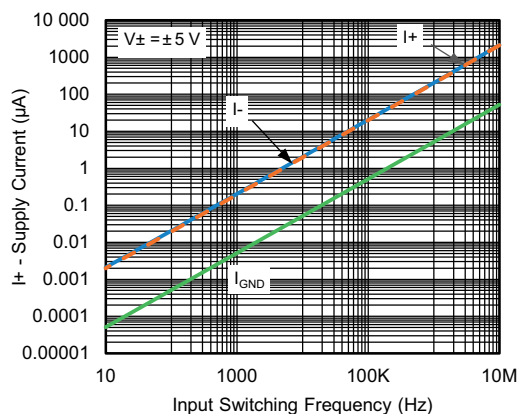
Insertion Loss, Off-Isolation Crosstalk vs. Frequency



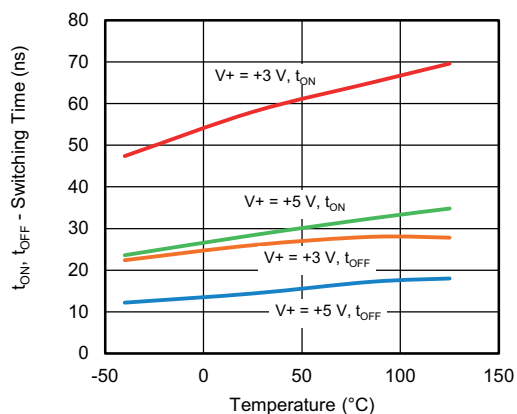
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



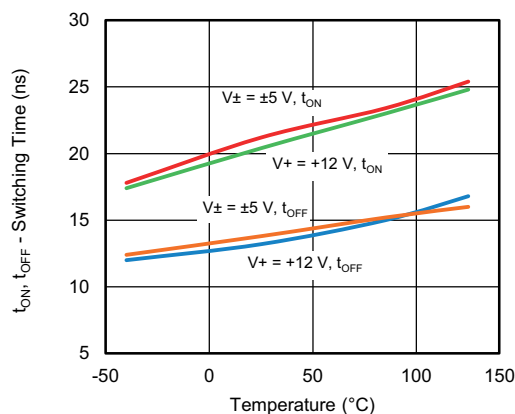
Supply Current vs. Input Switching Frequency



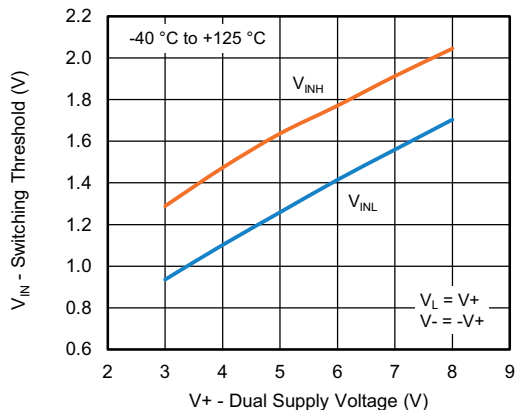
Supply Current vs. Input Switching Frequency



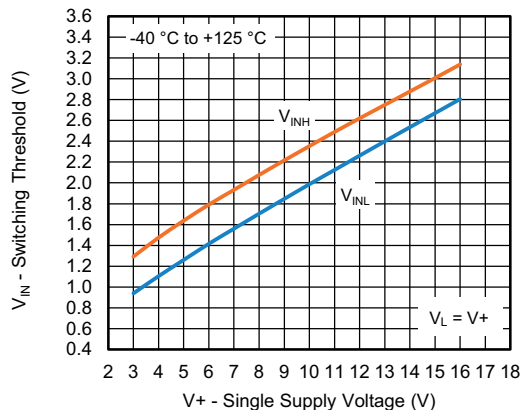
Switching Time vs. Temperature



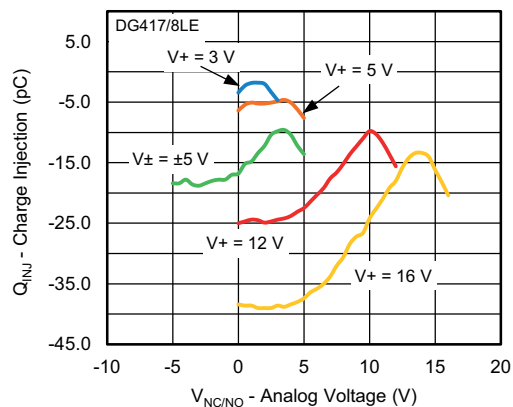
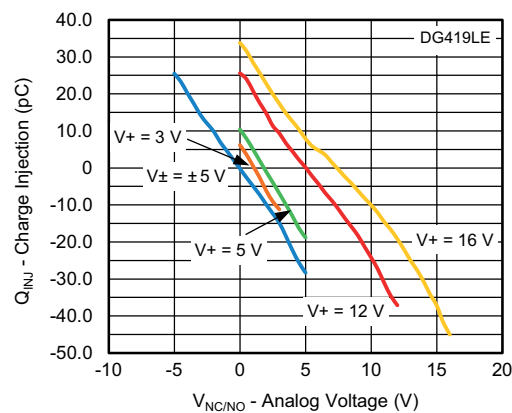
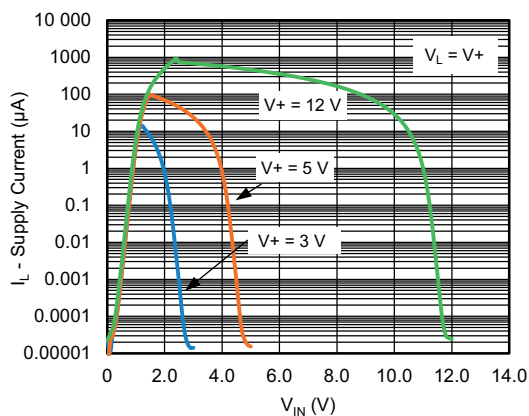
Switching Time vs. Temperature

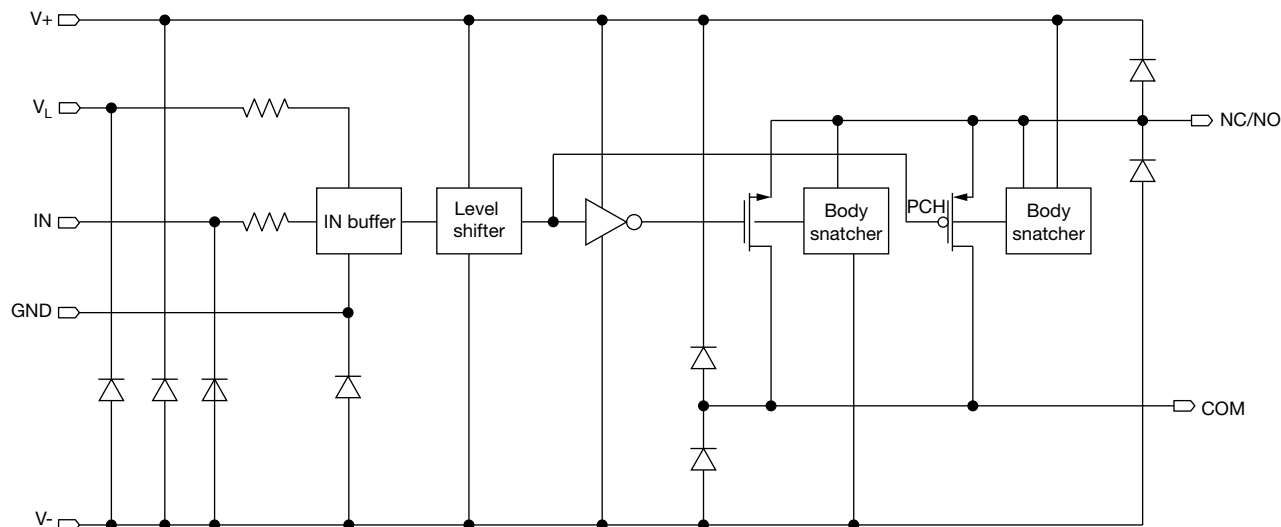
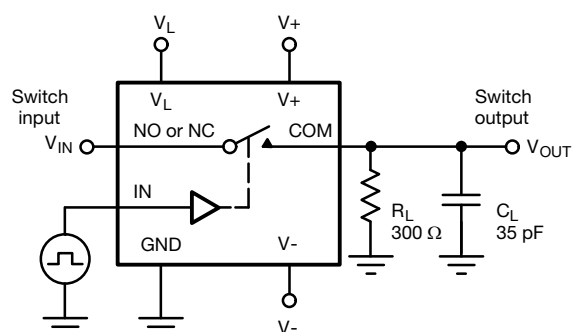


Switching Threshold vs. Dual Supply Voltage

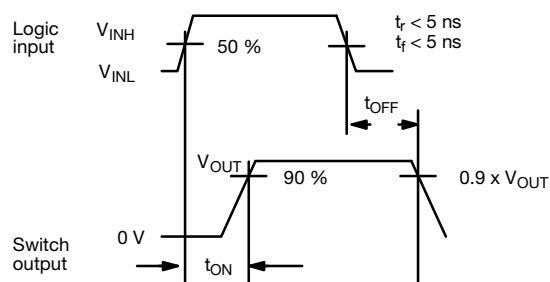


Switching Threshold vs. Single Supply Voltage

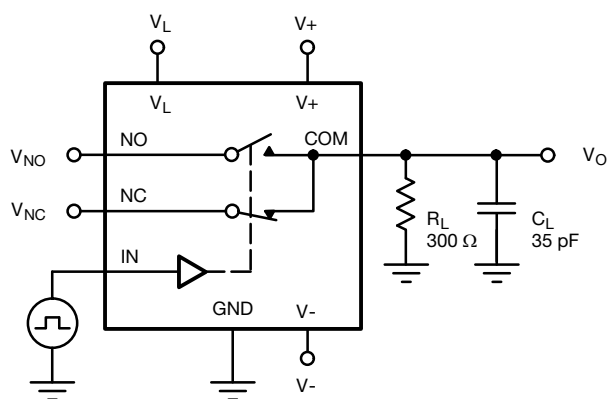
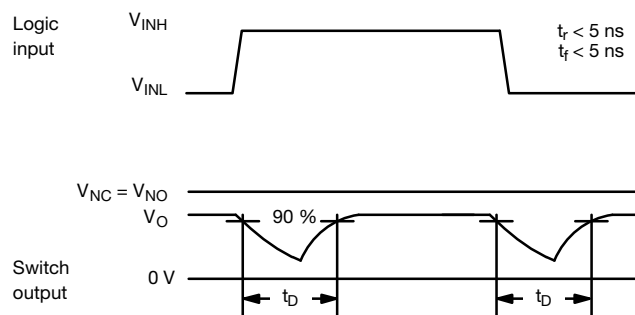
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Charge Injection vs. Analog Voltage

Charge Injection vs. Analog Voltage

Supply Current vs. Enable Input Voltage

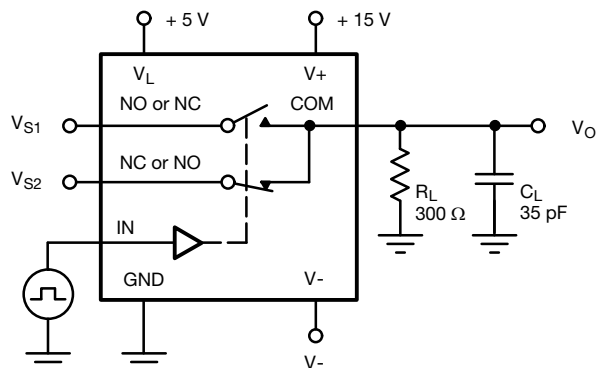
SCHEMATIC DIAGRAM (Typical channel)

TEST CIRCUITS

 C_L (includes fixture and stray capacitance)

$$V_{OUT} = V_{IN} \frac{R_L}{R_L + R_{ON}}$$

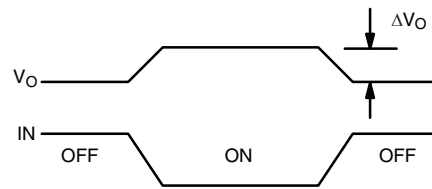
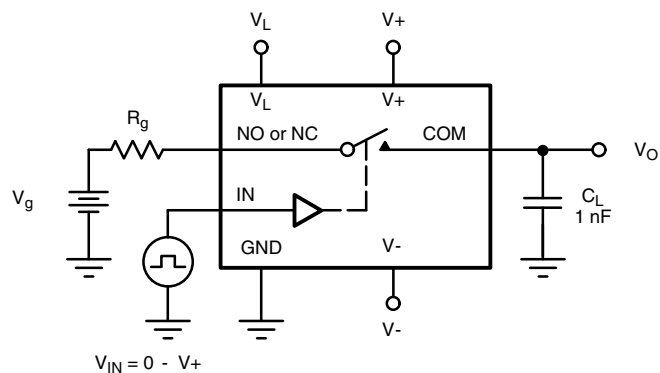

Note

- Logic input waveform is inverted for switches that have the opposite logic sense control

Fig. 1 - Switching Time

 C_L (includes fixture and stray capacitance)

Fig. 2 - Break-Before-Make (DG419LE)

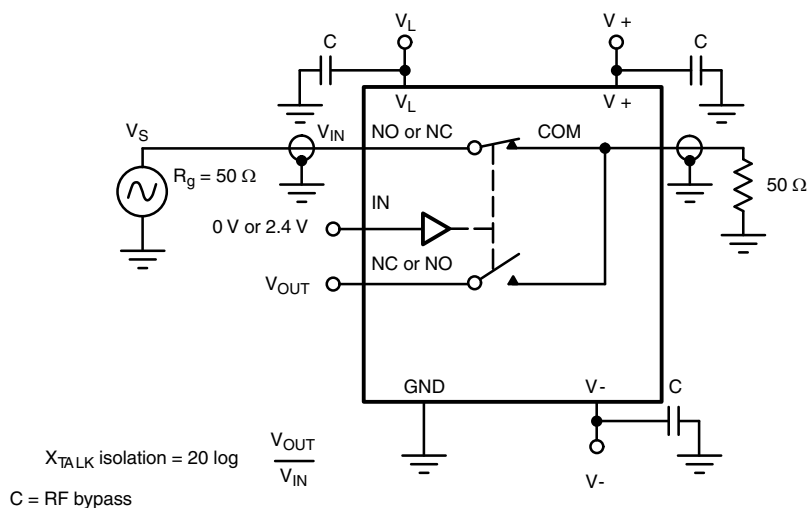
TEST CIRCUITS

 C_L (includes fixture and stray capacitance)

$$V_O = V_S \frac{R_L}{R_L + R_{ON}}$$

Fig. 3 - Transition Time (DG419LE)


$$Q = \Delta V_O \times C_L$$

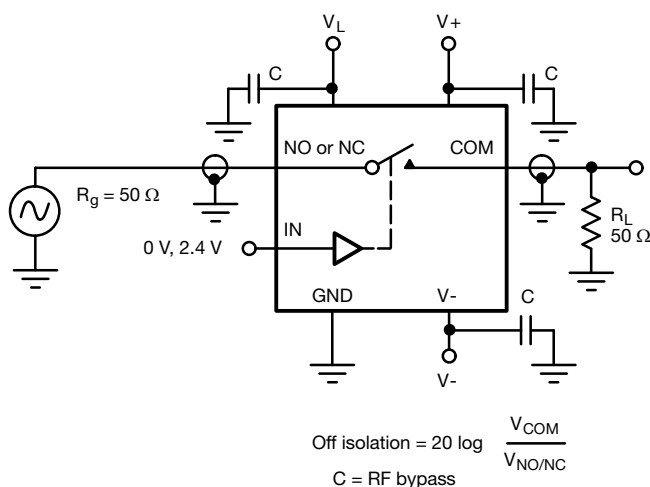
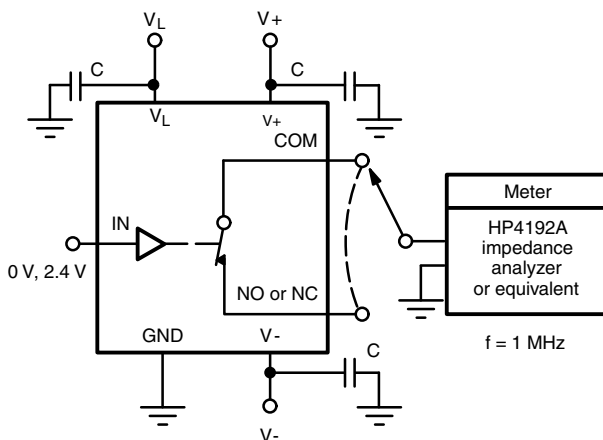
IN dependent on switch configuration input polarity determined by sense of switch.

Fig. 4 - Charge Injection


$$X_{\text{TALK isolation}} = 20 \log \frac{V_{\text{OUT}}}{V_{\text{IN}}}$$

C = RF bypass

Fig. 5 - Crosstalk (DG419LE)

TEST CIRCUITS

Fig. 6 - Off Isolation

Fig. 7 - Channel Capacitances

**PRODUCT SUMMARY**

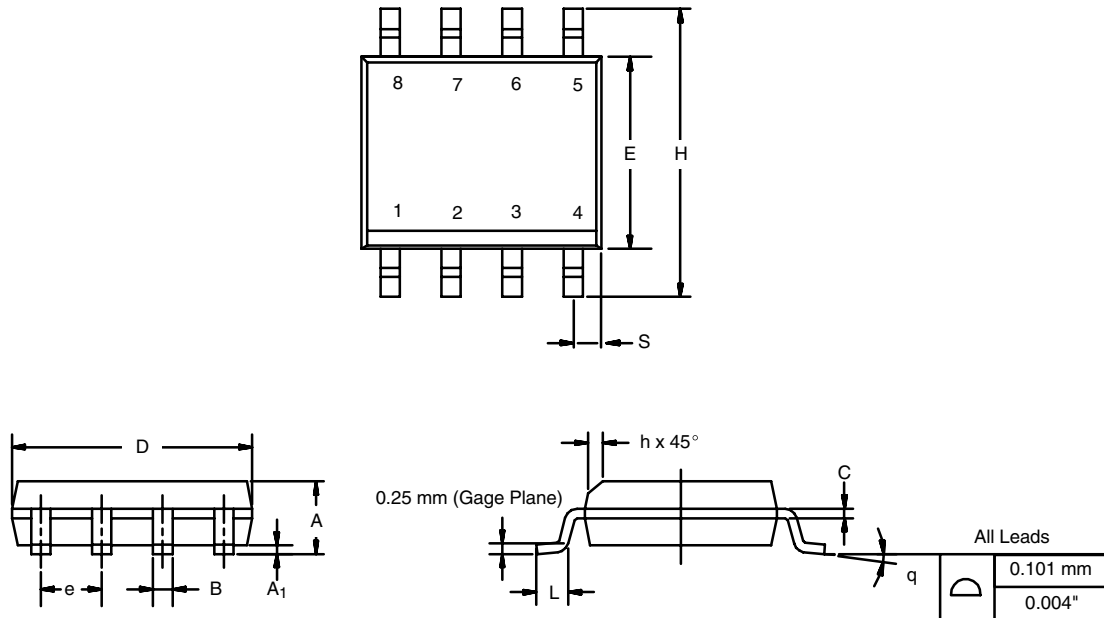
| Part number | DG417LE | DG417LE | DG418LE | DG418LE | DG419LE | DG419LE |
|-----------------------------------|--|--|--|--|--|--|
| Status code | 2 | 2 | 2 | 2 | 2 | 2 |
| Configuration | SPST x 1, NC | SPST x 1, NC | SPST x 1, NO | SPST x 1, NO | SPDT x 1 | SPDT x 1 |
| Single supply min. (V) | 3 | 3 | 3 | 3 | 3 | 3 |
| Single supply max. (V) | 16 | 16 | 16 | 16 | 16 | 16 |
| Dual supply min. (V) | 3 | 3 | 3 | 3 | 3 | 3 |
| Dual supply max. (V) | 8 | 8 | 8 | 8 | 8 | 8 |
| On-resistance (Ω) | 6 | 6 | 6 | 6 | 12 | 12 |
| Charge injection (pC) | -17 | -17 | -17 | -17 | -17 | -17 |
| Source on capacitance (pF) | 33 | 33 | 33 | 33 | 29 | 29 |
| Source off capacitance (pF) | 11 | 11 | 11 | 11 | 6 | 6 |
| Leakage switch on typ. (nA) | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Leakage switch off max. (nA) | 2 | 2 | 2 | 2 | 2 | 2 |
| -3 dB bandwidth (MHz) | - | - | - | - | - | - |
| Package | SO-8 (narrow) AS | MSOP-8 | SO-8 (narrow) AS | MSOP-8 | SO-8 (narrow) AS | MSOP-8 |
| Functional circuit / applications | Multi purpose, instrumentation, medical and healthcare, portable | Multi purpose, instrumentation, medical and healthcare, portable | Multi purpose, instrumentation, medical and healthcare, portable | Multi purpose, instrumentation, medical and healthcare, portable | Multi purpose, instrumentation, medical and healthcare, portable | Multi purpose, instrumentation, medical and healthcare, portable |
| Interface | Parallel | Parallel | Parallel | Parallel | Parallel | Parallel |
| Single supply operation | Yes | Yes | Yes | Yes | Yes | Yes |
| Dual supply operation | Yes | Yes | Yes | Yes | Yes | Yes |
| Turn on time max. (ns) | 38 | 38 | 38 | 38 | 38 | 38 |
| Crosstalk and off isolation | -68 | -68 | -68 | -68 | -68 | -68 |

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SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012

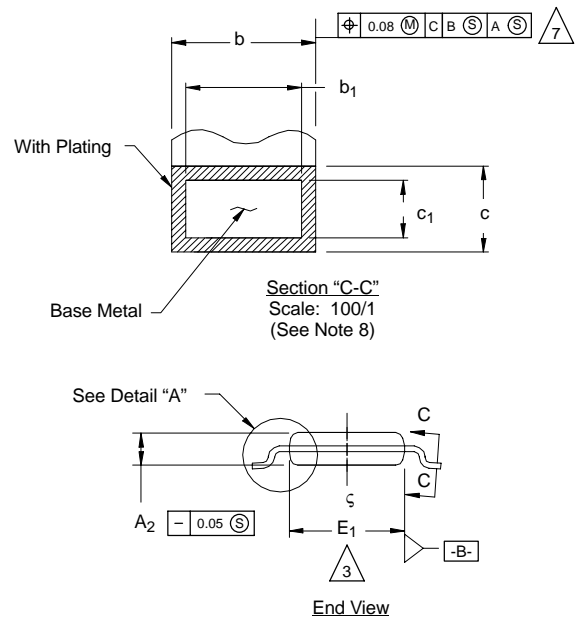
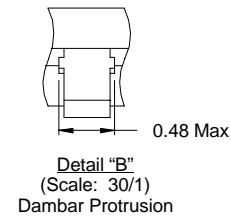
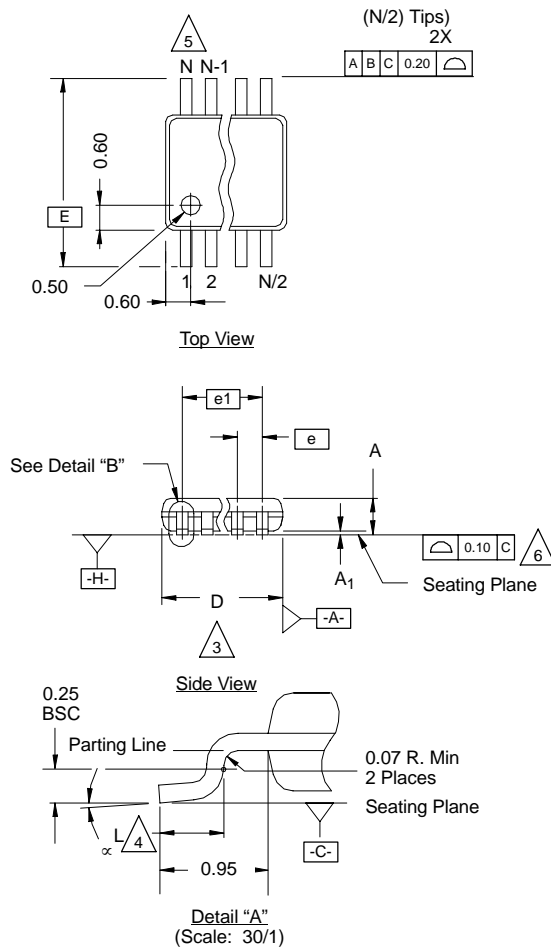


| DIM | MILLIMETERS | | INCHES | |
|--------------------------------|-------------|------|-----------|-------|
| | Min | Max | Min | Max |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A ₁ | 0.10 | 0.20 | 0.004 | 0.008 |
| B | 0.35 | 0.51 | 0.014 | 0.020 |
| C | 0.19 | 0.25 | 0.0075 | 0.010 |
| D | 4.80 | 5.00 | 0.189 | 0.196 |
| E | 3.80 | 4.00 | 0.150 | 0.157 |
| e | 1.27 BSC | | 0.050 BSC | |
| H | 5.80 | 6.20 | 0.228 | 0.244 |
| h | 0.25 | 0.50 | 0.010 | 0.020 |
| L | 0.50 | 0.93 | 0.020 | 0.037 |
| q | 0° | 8° | 0° | 8° |
| S | 0.44 | 0.64 | 0.018 | 0.026 |
| ECN: C-06527-Rev. I, 11-Sep-06 | | | | |
| DWG: 5498 | | | | |



MSOP: 8-LEADS

JEDEC Part Number: MO-187, (Variation AA and BA)



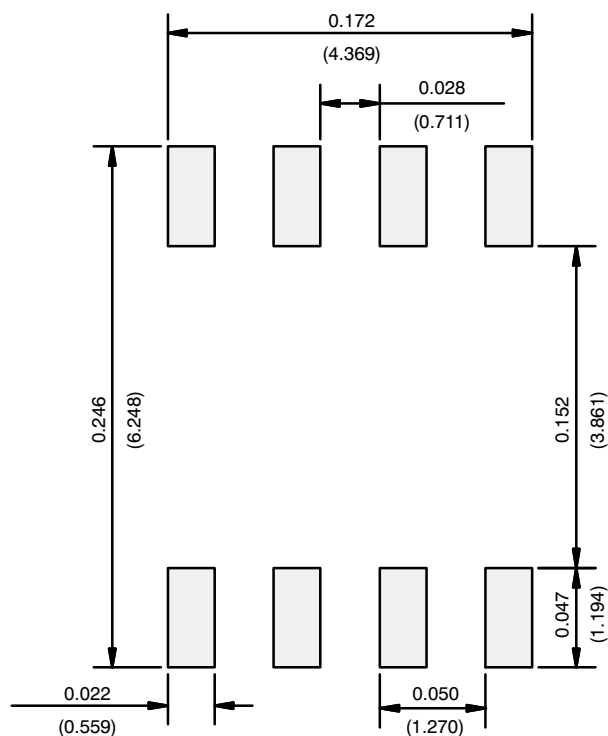
NOTES:

- Die thickness allowable is 0.203 ± 0.0127 .
- Dimensioning and tolerances per ANSI.Y14.5M-1994.
- Dimensions "D" and "E₁" do not include mold flash or protrusions, and are measured at Datum plane $\square\text{-H-}$, mold flash or protrusions shall not exceed 0.15 mm per side.
- Dimension is the length of terminal for soldering to a substrate.
- Terminal positions are shown for reference only.
- Formed leads shall be planar with respect to one another within 0.10 mm at seating plane.
- The lead width dimension does not include Dambar protrusion. Allowable Dambar protrusion shall be 0.08 mm total in excess of the lead width dimension at maximum material condition. Dambar cannot be located on the lower radius or the lead foot. Minimum space between protrusions and an adjacent lead to be 0.14 mm. See detail "B" and Section "C-C".
- Section "C-C" to be determined at 0.10 mm to 0.25 mm from the lead tip.
- Controlling dimension: millimeters.
- This part is compliant with JEDEC registration MO-187, variation AA and BA.
- Datums $\square\text{-A-}$ and $\square\text{-B-}$ to be determined Datum plane $\square\text{-H-}$.
- Exposed pad area in bottom side is the same as the leadframe pad size.

N = 8L

| Dim | MILLIMETERS | | | Note |
|---|-------------|------|------|------|
| | Min | Nom | Max | |
| A | - | - | 1.10 | |
| A ₁ | 0.05 | 0.10 | 0.15 | |
| A ₂ | 0.75 | 0.85 | 0.95 | |
| b | 0.25 | - | 0.38 | 8 |
| b ₁ | 0.25 | 0.30 | 0.33 | 8 |
| c | 0.13 | - | 0.23 | |
| c ₁ | 0.13 | 0.15 | 0.18 | |
| D | 3.00 BSC | | | 3 |
| E | 4.90 BSC | | | |
| E ₁ | 2.90 | 3.00 | 3.10 | 3 |
| e | 0.65 BSC | | | |
| e ₁ | 1.95 BSC | | | |
| L | 0.40 | 0.55 | 0.70 | 4 |
| N | 8 | | | 5 |
| α | 0° | 4° | 6° | |
| ECN: T-02080—Rev. C, 15-Jul-02 DWG: 5867 | | | | |

RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads
Dimensions in Inches/(mm)

[Return to Index](#)



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