# SK6215

**16V, 500mA, Low Power Consumption LDO**

## GENERAL DESCRIPTION

The SK6215 series is a set of three-terminal, lowpower, high voltage regulators implemented inCMOS technology. The series features extremelylow quiescent current which is typically 2.0μA.They allow input voltages as high as 16V. The deviceprovides large current with a significantly smalldropout voltage.

The SK6215 consists of a high-precision voltagereference, an error correction circuit, an over temperature protection circuit, and a currentlimited output driver. They are available with severalfixed output voltages ranging from 2.5V to 5.0V.CMOS technology ensures low dropout voltage and low current consumption. Although designedprimarily as fixed voltage regulators, these devicescan be used with external components to generatevariable voltages and currents.

The SK6215 regulators are available in standard SOT89-3L and SOT23-3L packages. Standard products are Pb-free and Halogen-free.

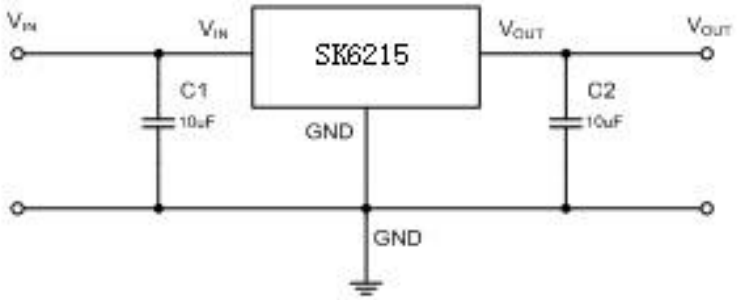
## FEATURES

- Input voltage: 3V~16V
- Output range: 2.5V~5.0V
- Outputcurrent:500mA(Within Max Power Dissipation)
- Dropout voltage: 200mV @ $V_{OUT}$=3.3V,$I_{OUT}$=100mA
- Quiescent current: 2μA Typ.
- Good line regulation: 0.01%
- Good load regulation: 5mV@1mA≤Io≤50mA
- Low temperature coefficient: 0.07mV/℃

## APPLICATIONS

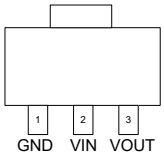
- Battery powered equipment
- Voltage regulator for microprocessor
- Voltage regulator for LAN cards
- Wireless communication equipment
- Audio/Video equipment

## TYPICAL APPLICATION CIRCUIT



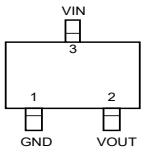
## PIN ASSIGNMENT

**SK6215T3B** **SOT89-3L**




SOT89-3L（Top View）

**SK6215S3** **SOT23-3L**




SOT23-3L（Top View）

## ORDERING INFORMATION

| PART NO | PACAKGE | TEMPERATURE | TAPE & REEL |
|---|---|---|---|
| SK6215S3-XX | SOT23-3L | -40 ~ +85℃ | 3000/REEL |
| SK6215T3B-XX | SOT89-3L | -40 ~ +85℃ | 1000/REEL |

*"XX": several fixed output voltages ranging from 2.5V to 5.0V*

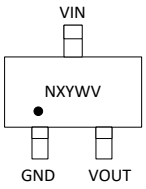
## PART NUMBER RULES

**SK6215[1]-[2]**

| Code | Description |
|---|---|
| [1] | Package:<br>S3: SOT23-3L<br>T3B: SOT89-3L(Btypepin-out) |
| [2] | Voltage version:<br>XX: several fixed output voltages ranging from 2.5V to 5.0V<br>Example:<br>33: 3.3V |

## MARKING DESCRIPTION:

SOT23-3L:




"N": product code, here use "T" stands for "SK6215".

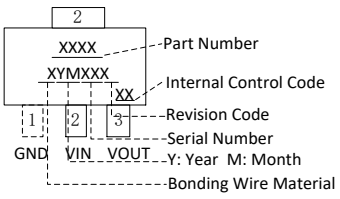
"X": Package factory

"Y": Wafer foundry vendor.

"W": The week of manufacturing. "A" stands for week 1, "Z" stands for week 26, "a" stands for week 27, "z" stands for week 52.

"V": Product version code.

SOT89-3L:



## PIN DESCRIPTION

| PIN NO | | SYMBOL | I/O | DESCRIPTTION |
|---|---|---|---|---|
| SK6215T3B | SK6215S3 | | | |
| 1 | 1 | GND | Ground | Ground |
| 2 | 3 | VIN | Power | Input |
| 3 | 2 | VOUT | O | Output |

## ABSOLUTE MAXIMUM RATINGS(Note)

| SYMBOL | ITEMS | VALUE | UNIT |
|---|---|---|---|
| $V_{IN}$ | Input Voltage | -0.3~20 | V |
| $V_{OUT}$ | Output Voltage | -0.3~$V_{IN}$ | V |
| $P_{DMAX}$ | Power Dissipation | OTPLimited | W |
| $T_J$ | Junction Temperature | -40~125 | ℃ |
| $T_{STG}$ | Storage Temperature | -55 to 150 | ℃ |
| $T_{SOLDER}$ | Package Lead Soldering Temperature | 260℃, 10s | |

***Note:*** *Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.*

## RECOMMANDED OPERATING RANGE

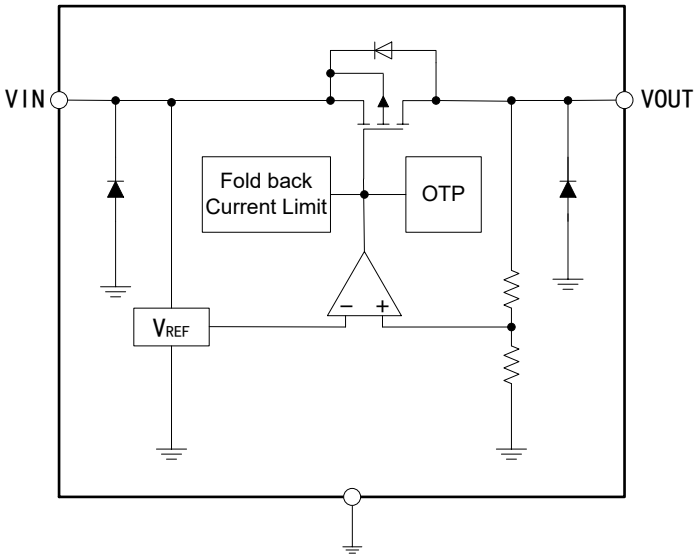
| SYMBOL | ITEMS | VALUE | UNIT |
|---|---|---|---|
| $V_{IN}$ | VIN Supply Voltage | 3 to 16 | V |
| $R_{\theta JA}$ | Thermal Resistance on PCB | 75 | ℃/W |
| $T_{OPT}$ | Operating Temperature | -40 to +85 | ℃ |

## ELECTRICAL CHARACTERISTICS

The following specifications apply for $V_{OUT}$=3.3V$T_A$=25℃,unless specified otherwise.

| SYMBOL | ITEMS | CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{IN}$ | Input Voltage | | 3 | 5 | 16 | V |
| $V_{OUT}$ | $V_{OUT}$ Range | $V_{IN}$= $V_{OUT}$+ 2V, $I_{OUT}$=1mA | $V_{OUT}$*0.98 | $V_{OUT}$ | $V_{OUT}$*1.02 | V |
| $I_{OUT}$ | Output Current | Within Maximum Power Dissipation | | 500 | | mA |
| $I_Q$ | Quiescent Current | No Load | | 2 | | μA |
| $V_{DROP}$ | Dropout Voltage | $V_{OUT}$=3.3V, $I_{OUT}$=100mA, ΔV=2% | | 200 | | mV |
| | | $V_{OUT}$=5.0V, $I_{OUT}$=100mA, ΔV=2% | | 115 | | |
| △$V_{LINE}$ | Line Regulation | $V_{IN}$= 4~14 V,$I_{OUT}$=1mA | | 0.01 | 0.07 | %/V |
| △$V_{LOAD}$ | Load Regulation | $V_{IN}$ = $V_{OUT}$+ 2V,$I_{OUT}$=1~50mA | | 5 | | mV |
| $I_{SHORT}$ | Short Current | $V_{OUT}$ Short to GND with 3Ω | | 90 | | mA |
| Δ$V_{OUT}$/ΔTa | Temperature coefficient | $I_{OUT}$=1mA, 0≤Ta≤70℃ | | 0.07 | 0.2 | mV/℃ |
| $T_{SD}$ | Thermal Shutdown Protectio | $V_{IN}$= $V_{OUT}$+ 2 V, $I_{OUT}$= 1 mA | | 160 | | ℃ |

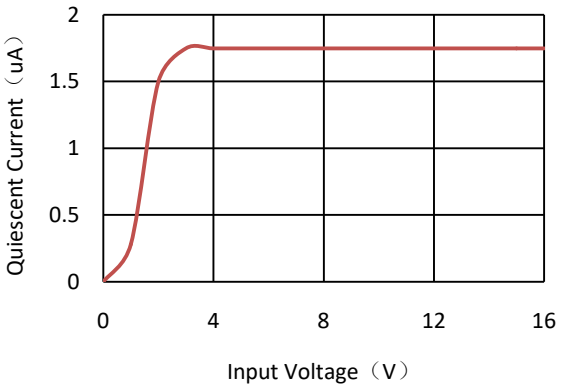
## SIMPLIFIED BLOCK DIAGRAM



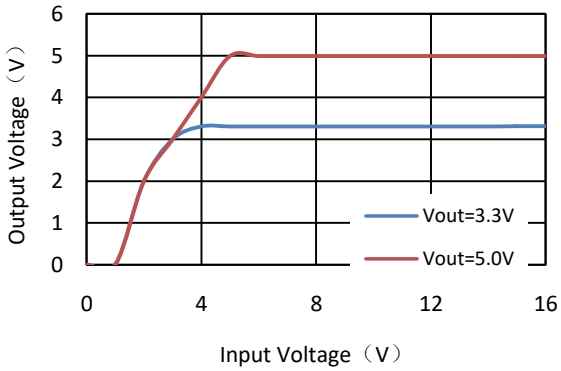
## TYPICAL PERFORMANCE CHARACTERISTICS

$C_{IN}$=10μF, $C_{OUT}$=10μF,$T_{OPT}$=25℃,$V_{IN}$=5.3V,$V_{OUT}$=3.3V,unless specified otherwise.

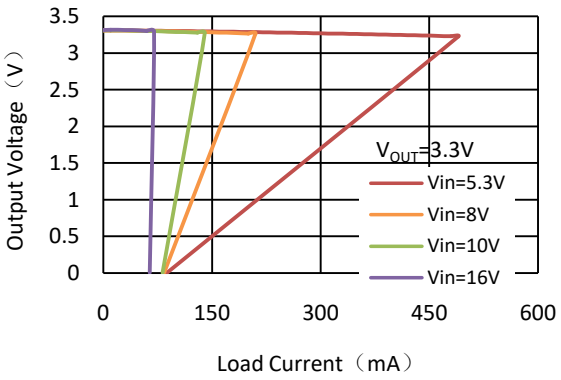
Quiescent Current vs. Input Voltage



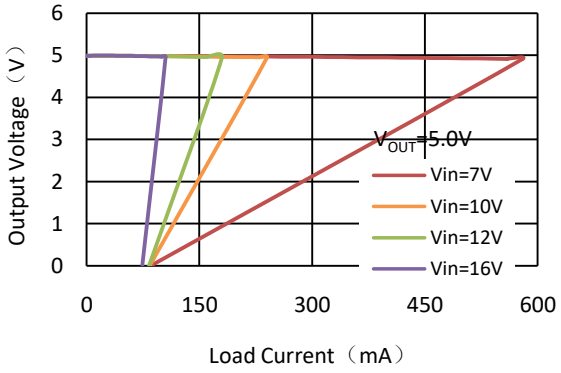

Output Voltage vs. Input Voltage



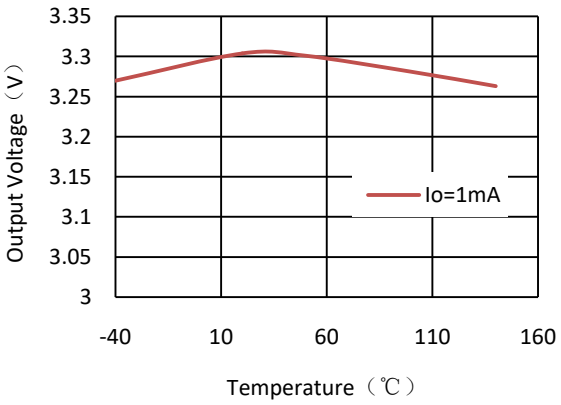

Output Voltage vs. Load Current



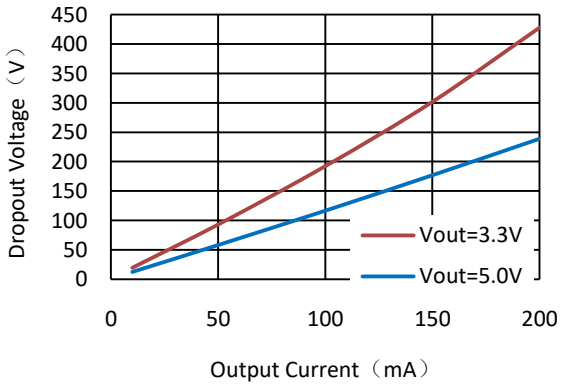

Output Voltage vs. Load Current




Output Voltage vs. Temperature

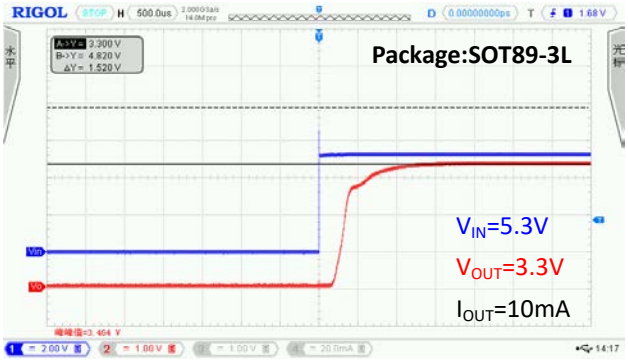


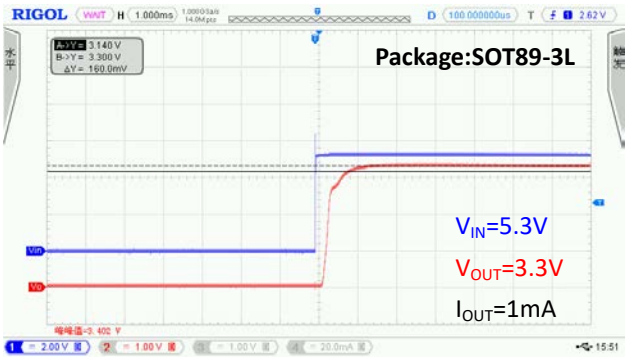

Dropout Voltage vs. Output Current



## Power ON

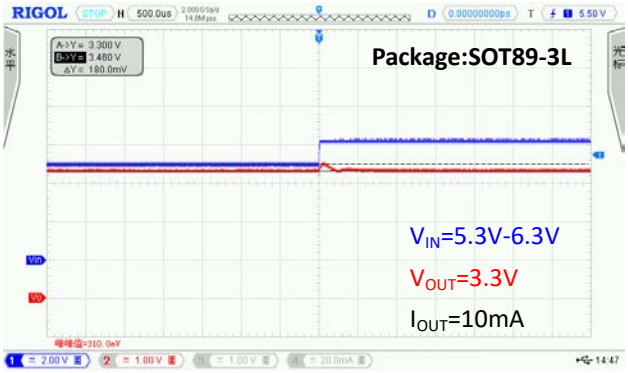
CH1：$V_{IN}$CH2：$V_{OUT}$

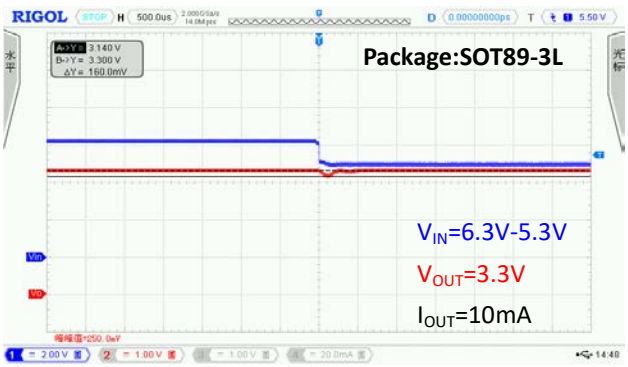


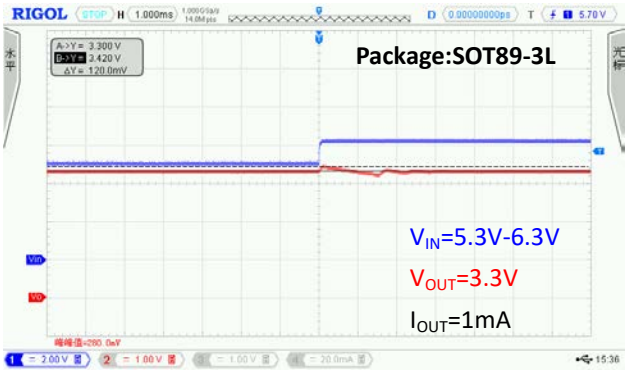



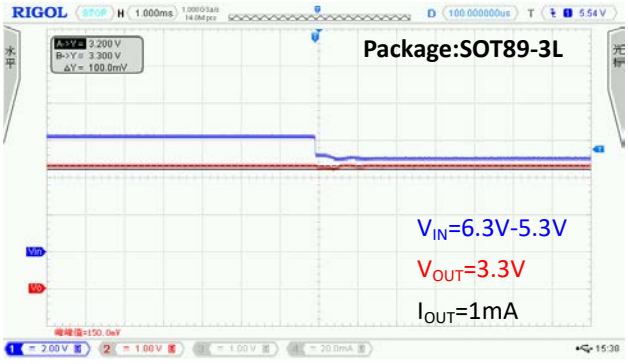

## Line Transient

CH1：$V_{IN}$CH2：$V_{OUT}$



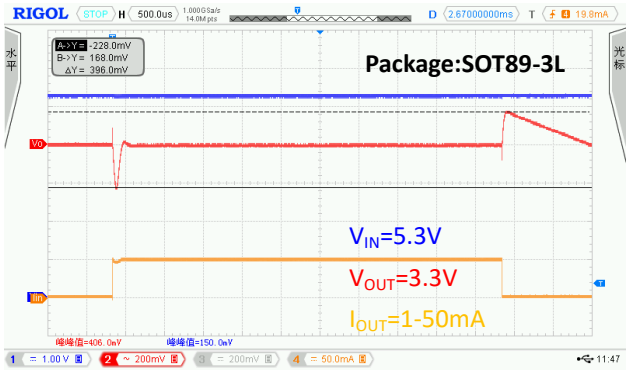



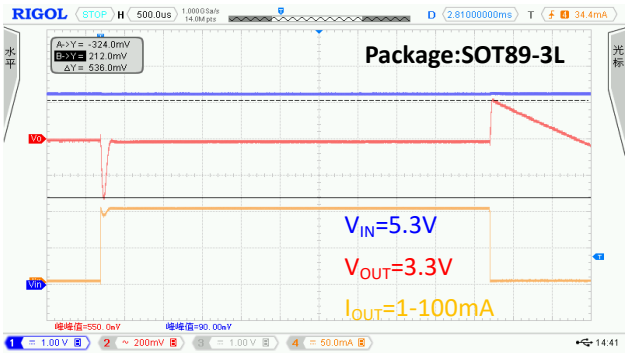




## Load Transient

CH1：$V_{IN}$CH2：$V_{OUT}$CH4：$I_{OUT}$

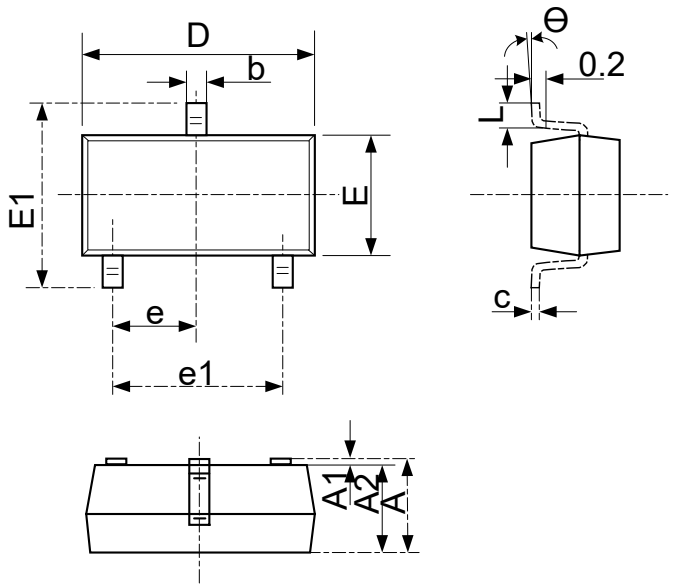


# PACKAGE OUTLINE

| Package | SOT23-3L | Devices per reel | 3000Pcs | Unit | mm |
|---|---|---|---|---|---|

Package Dimension：

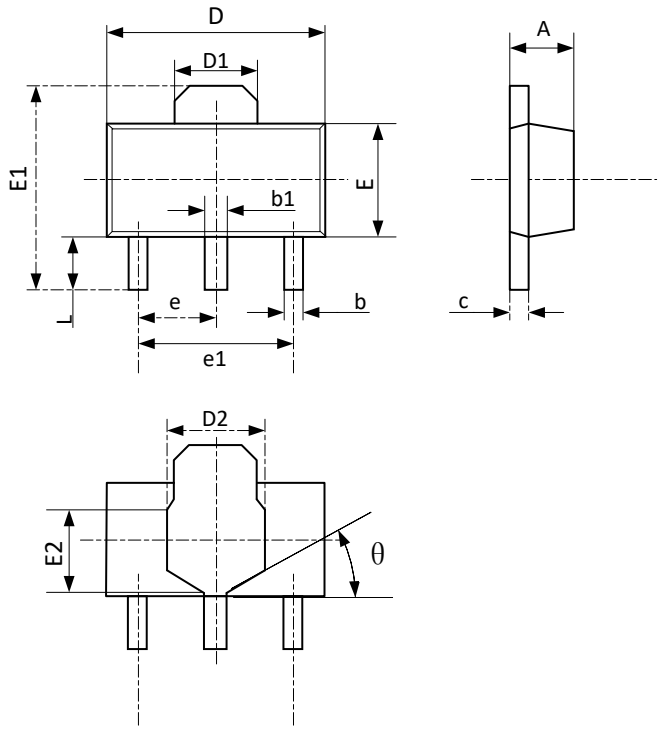



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0℃ | 8℃ | 0℃ | 8℃ |

# PACKAGE OUTLINE

| Package | SOT89-3L | Devices per reel | 1000Pcs | Unit | mm |
|---|---|---|---|---|---|

Package Dimension：




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.020 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF | | 0.061 REF | |
| D2 | 1.750 REF | | 0.069 REF | |
| E | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| E2 | 1.900 REF | | 0.075 REF | |
| e | 1.500 TYP | | 0.060 TYP | |
| e1 | 3.000 TYP | | 0.118 TYP | |
| L | 0.900 | 1.200 | 0.035 | 0.047 |
| θ | 45° | | 45° | |

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