

NPN General-Purpose Amplifier

2N5551

Description

This device is designed for general-purpose high-voltage amplifiers and gas discharge display drivers.

Features

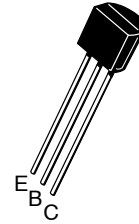
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

ABSOLUTE MAXIMUM RATINGS (Note 1)

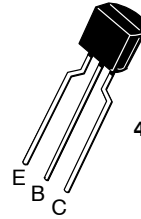
| Symbol | Parameter | Value | Unit |
|----------------|--|--------------|------|
| V_{CEO} | Collector-Emmitter Voltage | 160 | V |
| V_{CBO} | Collector-Base Voltage | 180 | V |
| V_{EBO} | Emitter-Base Voltage | 6 | V |
| I_C | Collector Current - Continuous | 600 | mA |
| T_J, T_{STG} | Operating and Storage Temperature (Note 2) | -55 to + 150 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.
2. These ratings are based on a maximum junction temperature of 150°C. These are steady-state limits. **onsemi** should be consulted on applications involving pulsed or low-duty cycle operations.

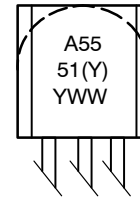


TO-92-3
 4.825x4.76
 CASE 135AN



TO-92-3
 4.83x4.76 LEADFORMED
 CASE 135AR

MARKING DIAGRAM



- A = Assembly Location
- 5551(Y) = Specific Device Code
- Y = Year
- WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

2N5551

THEMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 3)

| Symbol | Characteristic | Max | Unit |
|-----------------|---|------|---------------------------|
| P_D | Total Device Dissipation | 625 | mW |
| | Derate Above 25°C | 5.0 | mW/ $^\circ\text{C}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 83.3 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 200 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 4)

| Symbol | Parameter | Test Conditions | Min | Max | Unit |
|---------------|-------------------------------------|--|-----|-----|---------------|
| $V_{(BR)CEO}$ | Collector–Emitter Breakdown Voltage | $I_C = 1.0\text{ mA}$, $I_B = 0$ | 160 | | V |
| $V_{(BR)CBO}$ | Collector–Base Breakdown Voltage | $I_C = 100\ \mu\text{A}$, $I_E = 0$ | 180 | | V |
| $V_{(BR)EBO}$ | Emitter–Base Breakdown Voltage | $I_E = 10\ \mu\text{A}$, $I_C = 0$ | 6.0 | | V |
| I_{CBO} | Collector Cut–Off Current | $V_{CB} = 120\text{ V}$, $I_E = 0$ | | 50 | nA |
| | | $V_{CB} = 120\text{ V}$, $I_E = 0\text{ V}$, $T_A = 100^\circ\text{C}$ | | 50 | μA |
| I_{EBO} | Emitter Cut–Off Current | $V_{EB} = 4.0\text{ V}$, $I_C = 0$ | | 50 | nA |

ON CHARACTERISTICS

| | | | | | |
|---------------|--------------------------------------|--|-----|------|---|
| h_{FE} | DC Current Gain | $I_C = 1.0\text{ mA}$, $V_{CE} = 5.0\text{ V}$ | 80 | | |
| | | $I_C = 10\text{ mA}$, $V_{CE} = 5.0\text{ V}$ | 80 | 250 | |
| | | $I_C = 10\text{ mA}$, $V_{CE} = 5.0\text{ V}$ (for 2N5551YBU, 2N5551YTA) | 180 | 240 | |
| | | $I_C = 50\text{ mA}$, $V_{CE} = 5.0\text{ V}$ | 30 | | |
| $V_{CE(sat)}$ | Collector–Emitter Saturation Voltage | $I_C = 10\text{ mA}$, $I_B = 1.0\text{ mA}$ | | 0.15 | V |
| | | $I_C = 50\text{ mA}$, $I_B = 5.0\text{ mA}$ | | 0.20 | V |
| $V_{BE(sat)}$ | Base–Emitter On Voltage | $I_C = 10\text{ mA}$, $I_B = 1.0\text{ mA}$ | | 1.0 | V |
| | | $I_C = 50\text{ mA}$, $I_B = 5.0\text{ mA}$ | | 1.0 | V |

SMALL–SIGNAL CHARACTERISTICS

| | | | | | |
|-----------|--------------------------------|--|-----|-----|-----|
| f_T | Current Gain Bandwidth Product | $I_C = 10\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 100\text{ MHz}$ | 100 | | MHz |
| C_{obo} | Output Capacitance | $V_{CB} = 10\text{ V}$, $I_E = 0$, $f = 1.0\text{ MHz}$ | | 6.0 | pF |
| C_{ibo} | Input Capacitance | $V_{BE} = 0.5\text{ V}$, $I_C = 0$, $f = 1.0\text{ MHz}$ | | 20 | pF |
| H_{fe} | Small–Signal Current Gain | $I_C = 1.0\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1.0\text{ kHz}$ | 50 | 250 | |
| NF | Noise Figure | $I_C = 250\ \mu\text{A}$, $V_{CE} = 5.0\text{ V}$, $R_S = 1.0\text{ k}\Omega$, $f = 10\text{ Hz to }15.7\text{ kHz}$ | | 8.0 | dB |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. PCB board size FR–4 76 x 114 x 0.6 T mm³ (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

4. Pulse test: pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2.0\%$.

TYPICAL PERFORMANCE CHARACTERISTICS

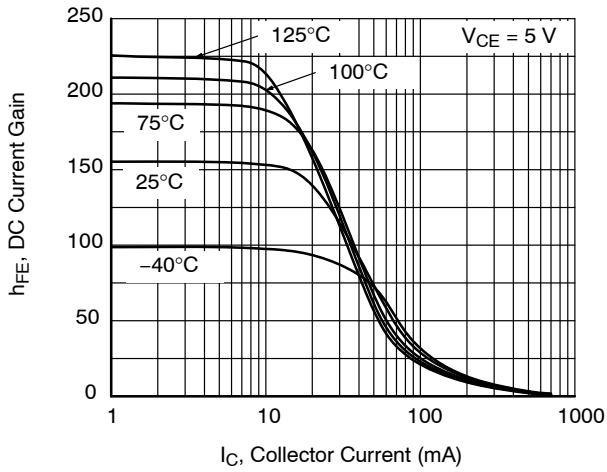


Figure 1. Typical Pulsed Current Gain vs. Collector Current

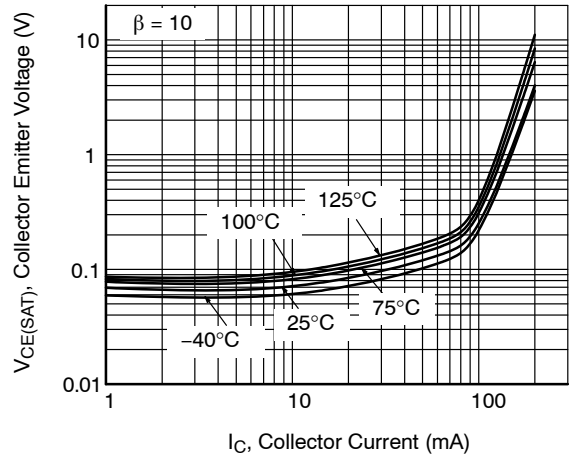


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

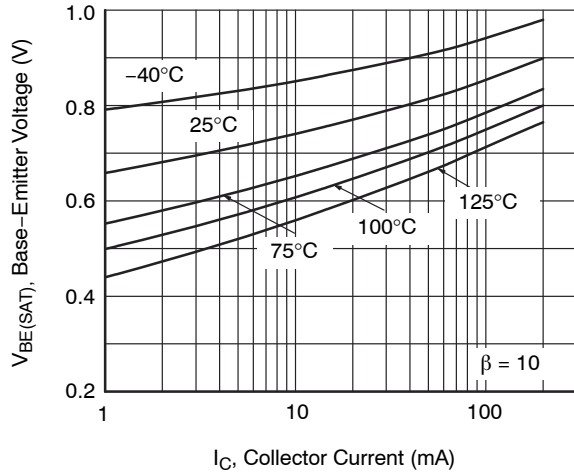


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

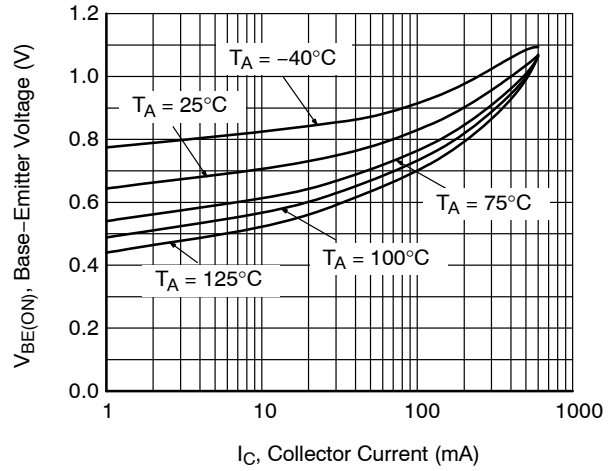


Figure 4. Base-Emitter On Voltage vs. Collector Current

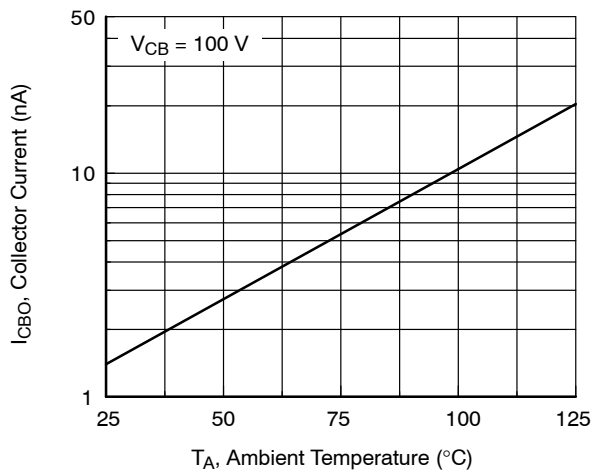


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

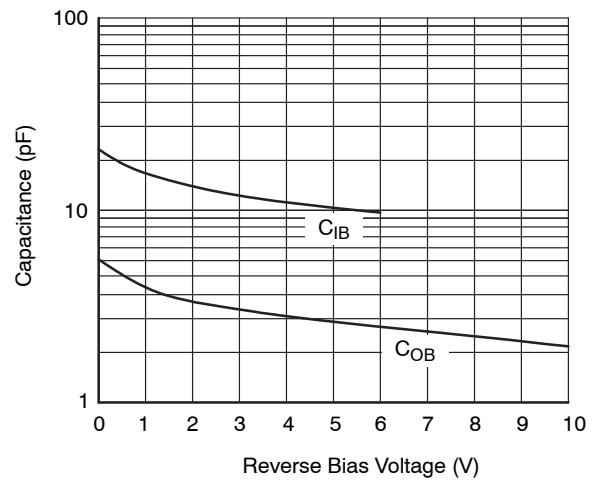


Figure 6. Input and Output Capacitance vs. Reverse Voltage

TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

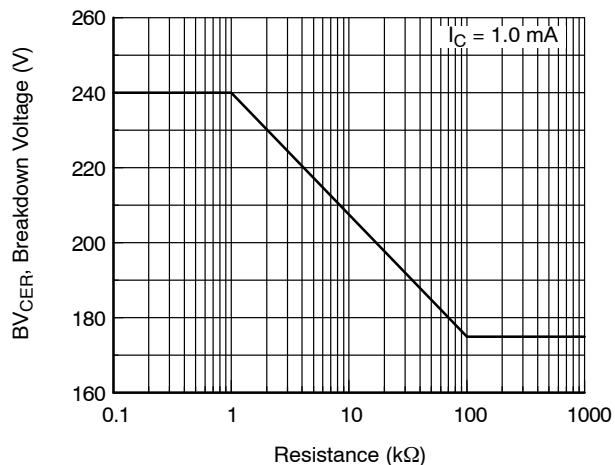


Figure 7. Collector-Emitter Breakdown Voltage with Resistance between Emitter-Base

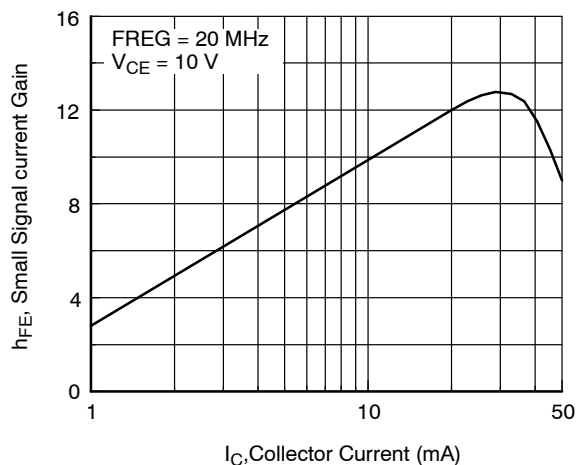


Figure 8. Small Signal Current Gain vs. Collector Current

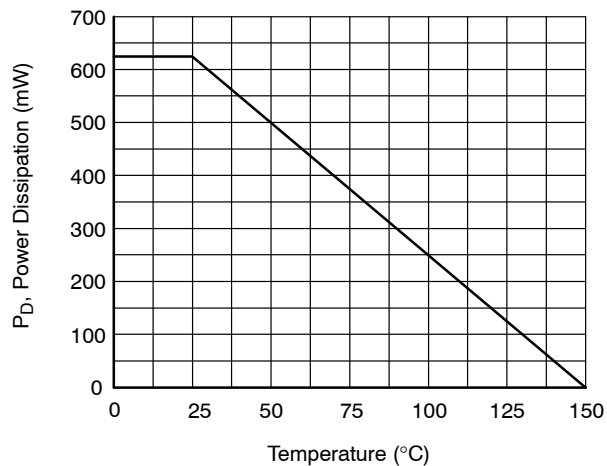


Figure 9. Power Dissipation vs. Ambient Temperature

2N5551

ORDERING INFORMATION (Note 5)

| Part Number | Top Mark | Package | Shipping† |
|-------------|----------|-------------------------------|--------------------|
| 2N5551TA | 5551 | TO-92-3, Case 135AR (Pb-Free) | 2000 / Ammo Pack |
| 2N5551TFR | 5551 | TO-92-3, Case 135AR (Pb-Free) | 2000 / Tape & Reel |
| 2N5551TF | 5551 | TO-92-3, Case 135AR (Pb-Free) | 2000 / Tape & Reel |
| 2N5551BU | 5551 | TO-92-3, Case 135AN (Pb-Free) | 10000 / Bulk Bag |
| 2N5551YBU | 5551Y | TO-92-3, Case 135AN (Pb-Free) | 10000 / Bulk Bag |
| 2N5551YTA | 5551Y | TO-92-3, Case 135AR (Pb-Free) | 2000 / Ammo Pack |

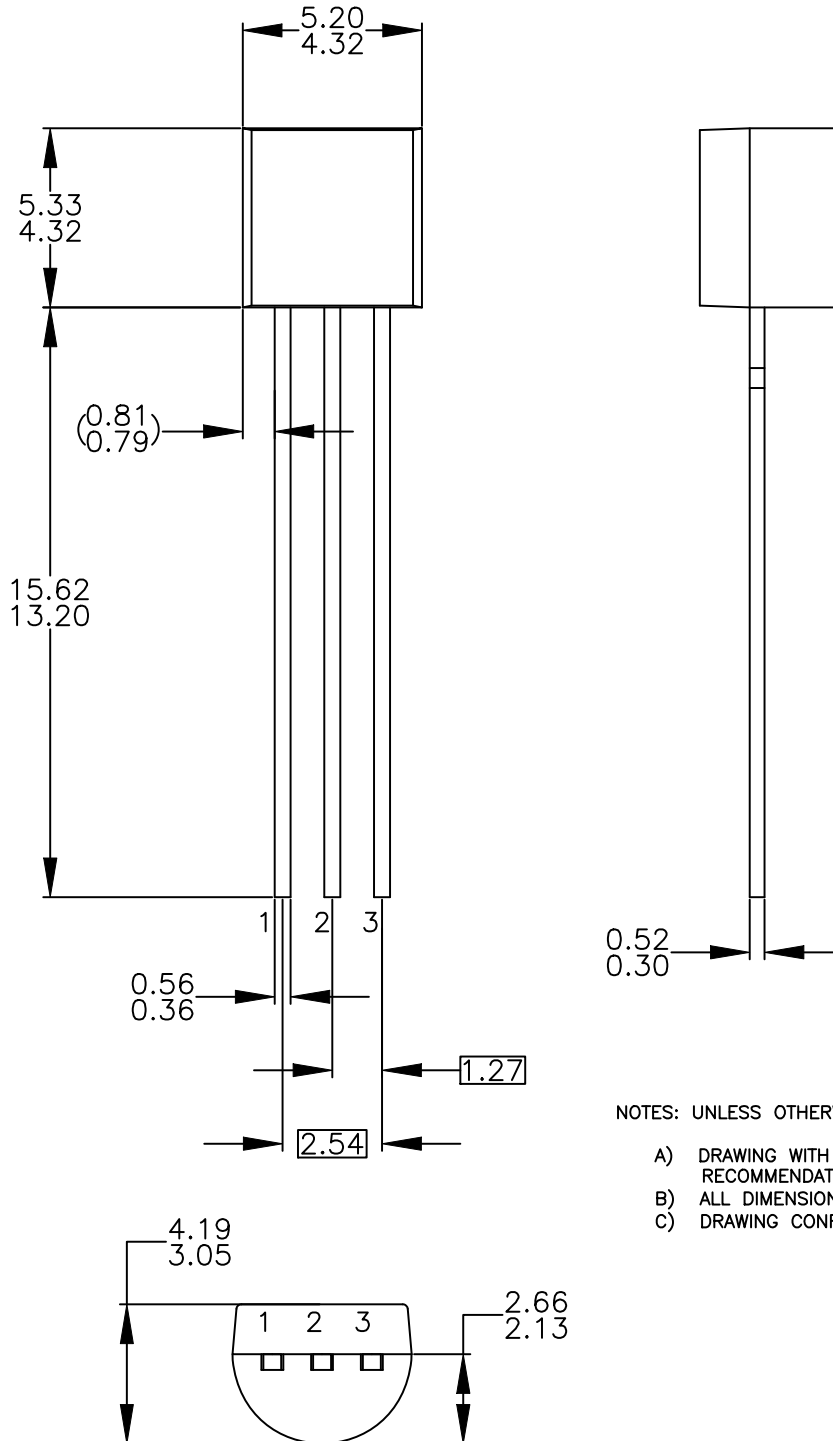
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

5. Suffix "-Y" means h_{FE} 180-240 in 2N5551 (Test condition: $I_C = 10$ mA, $V_{CE} = 5.0$ V)

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

TO-92 3 4.825x4.76
CASE 135AN
ISSUE O

DATE 31 JUL 2016



NOTES: UNLESS OTHERWISE SPECIFIED

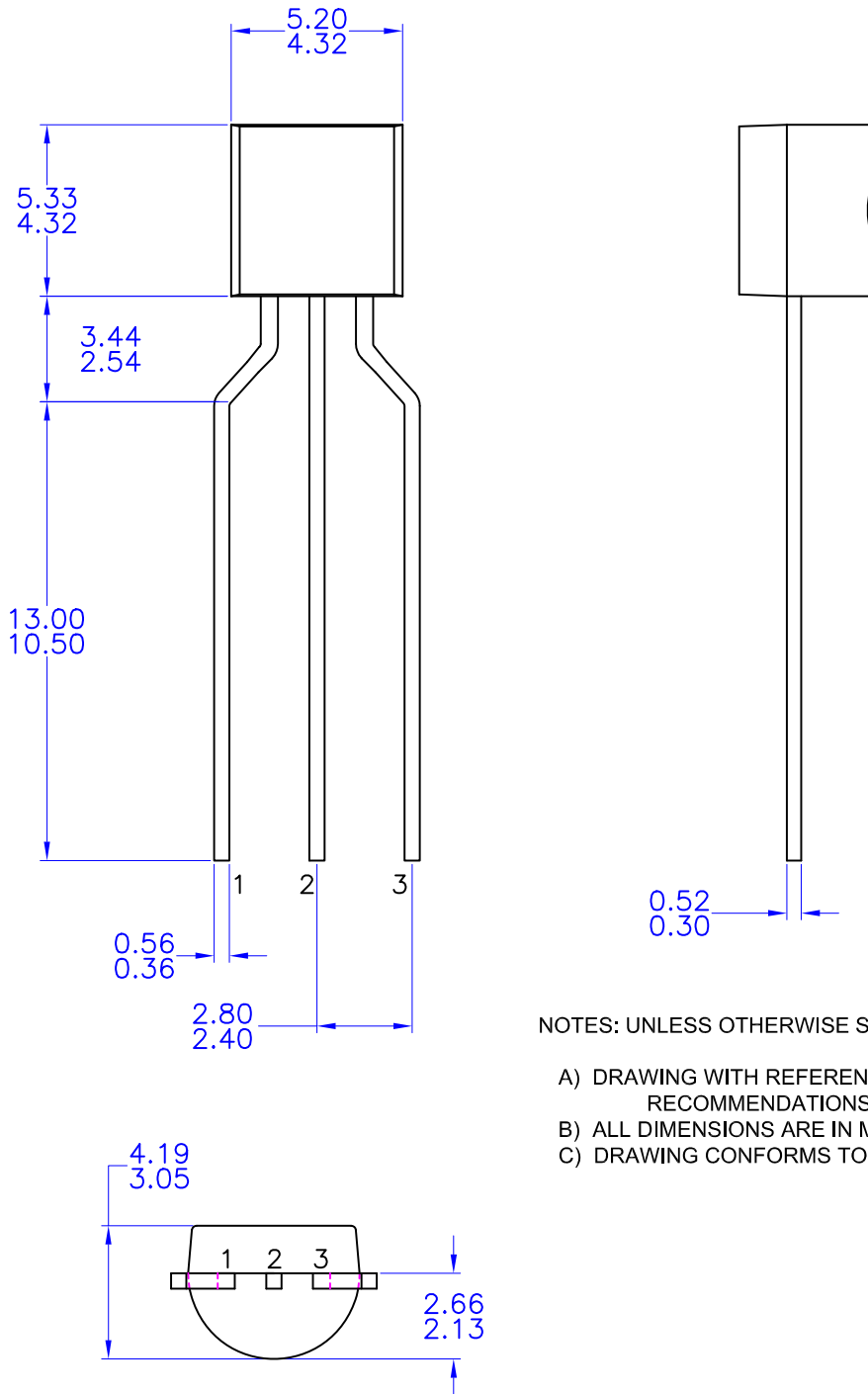
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TO-92 3 4.83x4.76 LEADFORMED
CASE 135AR
ISSUE O


DATE 30 SEP 2016



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