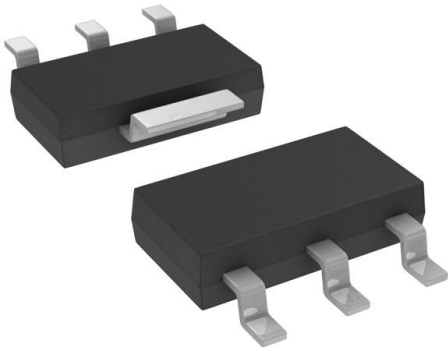


# NTF2955T1G Datasheet

[www.digi-electronics.com](http://www.digi-electronics.com)



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DiGi Electronics Part Number	NTF2955T1G-DG
Manufacturer	<a href="#">onsemi</a>
Manufacturer Product Number	NTF2955T1G
Description	MOSFET P-CH 60V 1.7A SOT223
Detailed Description	P-Channel 60 V 1.7A (Ta) 1W (Ta) Surface Mount SO T-223 (TO-261)



Tel: +00 852-30501935

RFQ Email: [Info@DiGi-Electronics.com](mailto:Info@DiGi-Electronics.com)

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## Purchase and inquiry

Manufacturer Product Number:

NTF2955T1G

Series:

-

FET Type:

P-Channel

Drain to Source Voltage (Vdss):

60 V

Drive Voltage (Max Rds On, Min Rds On):

10V

Vgs(th) (Max) @ Id:

4V @ 1mA

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 175°C (Tj)

Supplier Device Package:

SOT-223 (TO-261)

Base Product Number:

NTF2955

Manufacturer:

onsemi

Product Status:

Active

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

1.7A (Ta)

Rds On (Max) @ Id, Vgs:

185mOhm @ 2.4A, 10V

Gate Charge (Qg) (Max) @ Vgs:

14.3 nC @ 10 V

Input Capacitance (Ciss) (Max) @ Vds:

492 pF @ 25 V

Power Dissipation (Max):

1W (Ta)

Mounting Type:

Surface Mount

Package / Case:

TO-261-4, TO-261AA

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



# MOSFET – Power, Single, P-Channel, SOT-223

## -60 V, -2.6 A

## NTF2955, NVF2955

### Features

- Design for low  $R_{DS(on)}$
- Withstands High Energy in Avalanche and Commutation Modes
- AEC-Q101 Qualified – NVF2955
- These Devices are Pb-Free and are RoHS Compliant

### Applications

- Power Supplies
- PWM Motor Control
- Converters
- Power Management

### MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			$V_{DSS}$	-60	V
Gate-to-Source Voltage			$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Note 1)	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	-2.6	A
		$T_A = 85^\circ\text{C}$		-2.0	
Power Dissipation (Note 1)	Steady State	$T_A = 25^\circ\text{C}$	$P_D$	2.3	W
Continuous Drain Current (Note 2)	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	-1.7	A
		$T_A = 85^\circ\text{C}$		-1.3	
Power Dissipation (Note 2)		$T_A = 25^\circ\text{C}$	$P_D$	1.0	W
Pulsed Drain Current	$t_p = 10 \mu\text{s}$		$I_{DM}$	-17	A
Operating Junction and Storage Temperature			$T_J, T_{STG}$	-55 to 175	$^\circ\text{C}$
Single Pulse Drain-to-Source Avalanche Energy ( $V_{DD} = 25 \text{ V}, V_G = 10 \text{ V}, I_{PK} = 6.7 \text{ A}, L = 10 \text{ mH}, R_G = 25 \Omega$ )			EAS	225	mJ
Lead Temperature for Soldering Purposes (1/8" from case for 10 seconds)			$T_L$	260	$^\circ\text{C}$

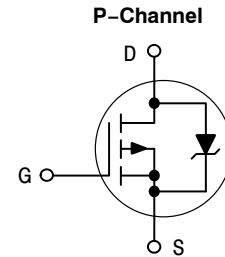
### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Unit
Junction-to-Tab (Drain) – Steady State (Note 2)	$R_{\theta JC}$	14	$^\circ\text{C/W}$
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	65	
Junction-to-Ambient – Steady State (Note 2)	$R_{\theta JA}$	150	

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. When surface mounted to an FR4 board using 1 in. pad size (Cu. area = 1.127 in<sup>2</sup> [1 oz] including traces)
2. When surface mounted to an FR4 board using the minimum recommended pad size (Cu. area = 0.341 in<sup>2</sup>)

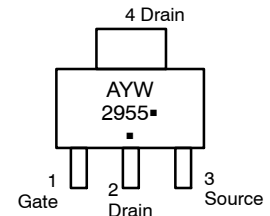
$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	$I_D$ MAX
-60 V	145 m $\Omega$ @ -10 V	-2.6 A



### MARKING DIAGRAM AND PIN ASSIGNMENT



**SOT-223  
CASE 318E  
STYLE 3**



- A = Assembly Location  
 Y = Year  
 W = Work Week  
 ■ = Pb-Free Package  
 (Note: Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
NTF2955T1G	SOT-223 (Pb-Free)	1000 /Tape & Reel
NVF2955T1G	SOT-223 (Pb-Free)	1000/ Tape & Reel

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

**NTF2955, NVF2955****ELECTRICAL CHARACTERISTICS** ( $T_J=25^\circ\text{C}$  unless otherwise stated)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
-----------	--------	----------------	-----	-----	-----	------

**OFF CHARACTERISTICS**

Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-60	-	-	V	
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$		-	66.4	-	mV/ $^\circ\text{C}$	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = 0\text{ V}, V_{DS} = -60\text{ V}$	$T_J = 25^\circ\text{C}$	-	-	-1.0	$\mu\text{A}$
			$T_J = 125^\circ\text{C}$	-	-	-50	
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	$\pm 100$	nA	

**ON CHARACTERISTICS** (Note 3)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -1.0\text{ mA}$	-2.0	-	-4.0	V
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -0.75\text{ A}$	-	145	170	m $\Omega$
		$V_{GS} = -10\text{ V}, I_D = -1.5\text{ A}$	-	150	180	
		$V_{GS} = -10\text{ V}, I_D = -2.4\text{ A}$	-	154	185	
Forward Transconductance	$g_{FS}$	$V_{GS} = -15\text{ V}, I_D = -0.75\text{ A}$	-	1.77		S

**CHARGES AND CAPACITANCES**

Input Capacitance	$C_{ISS}$	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = 25\text{ V}$	-	492	-	pF
Output Capacitance	$C_{OSS}$		-	165	-	
Reverse Transfer Capacitance	$C_{RSS}$		-	50	-	
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 10\text{ V}, V_{DS} = 30\text{ V}, I_D = 1.5\text{ A}$	-	14.3	-	nC
Threshold Gate Charge	$Q_{G(TH)}$		-	1.2	-	
Gate-to-Source Charge	$Q_{GS}$		-	2.3	-	
Gate-to-Drain Charge	$Q_{GD}$		-	5.2	-	

**SWITCHING CHARACTERISTICS** (Note 4)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 10\text{ V}, V_{DD} = 25\text{ V}, I_D = 1.5\text{ A}, R_G = 9.1\ \Omega, R_L = 25\ \Omega$	-	11	-	ns
Rise Time	$t_r$		-	7.6	-	
Turn-Off Delay Time	$t_{d(OFF)}$		-	65	-	
Fall Time	$t_f$		-	38	-	

**DRAIN-SOURCE DIODE CHARACTERISTICS**

Forward Diode Voltage	$V_{SD}$	$V_{GS} = 0\text{ V}, I_S = 1.5\text{ A}$	$T_J = 25^\circ\text{C}$	-	-1.10	-1.30	V
			$T_J = 125^\circ\text{C}$	-	-0.9	-	
Reverse Recovery Time	$t_{RR}$	$V_{GS} = 0\text{ V}, di_S/dt = 100\text{ A}/\mu\text{s}, I_S = 1.5\text{ A}$	-	36	-	ns	
Charge Time	$t_a$		-	20	-		
Discharge Time	$t_b$		-	16	-		
Reverse Recovery Charge	$Q_{RR}$		-	0.139	-		nC

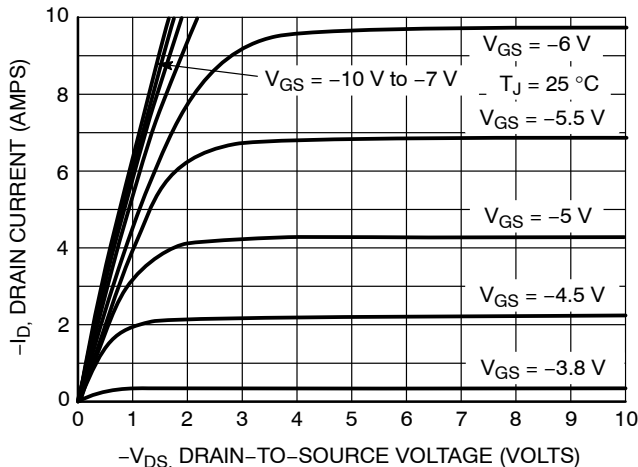
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

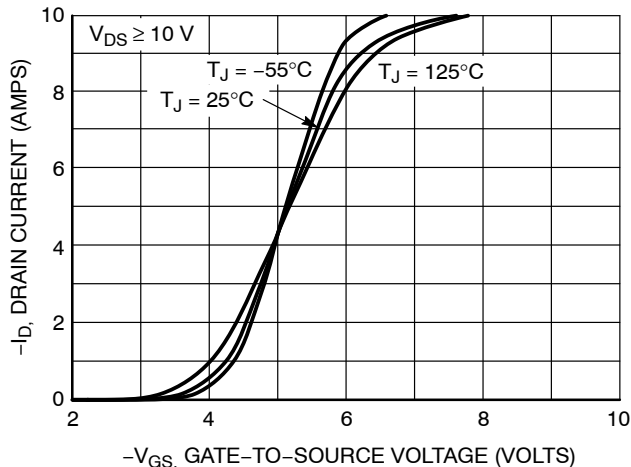
4. Switching characteristics are independent of operating junction temperatures.

**NTF2955, NVF2955**

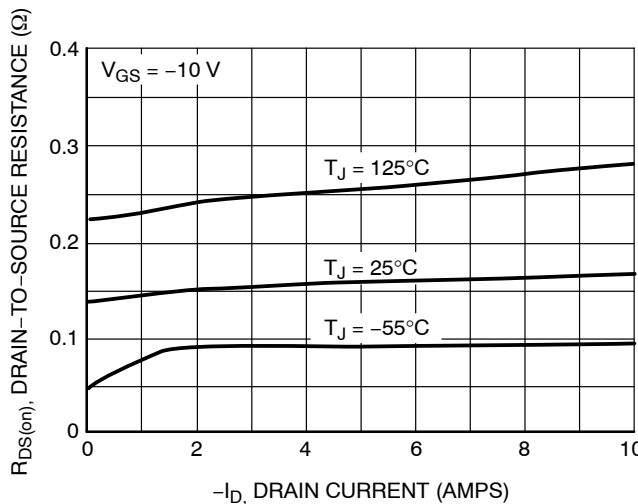
**TYPICAL PERFORMANCE CURVES** ( $T_J = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)



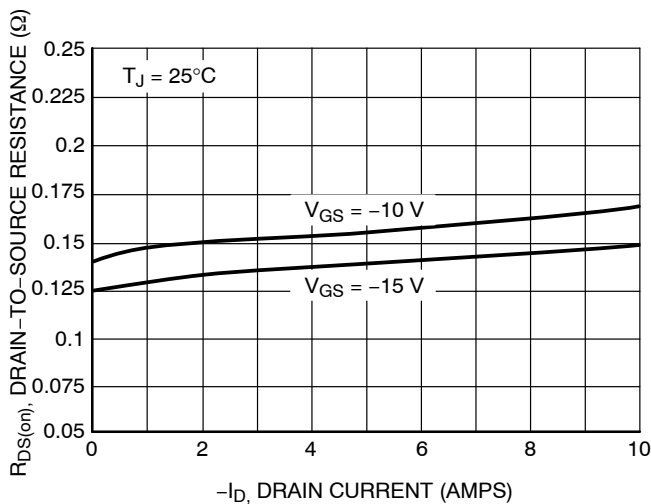
**Figure 1. On-Region Characteristics**



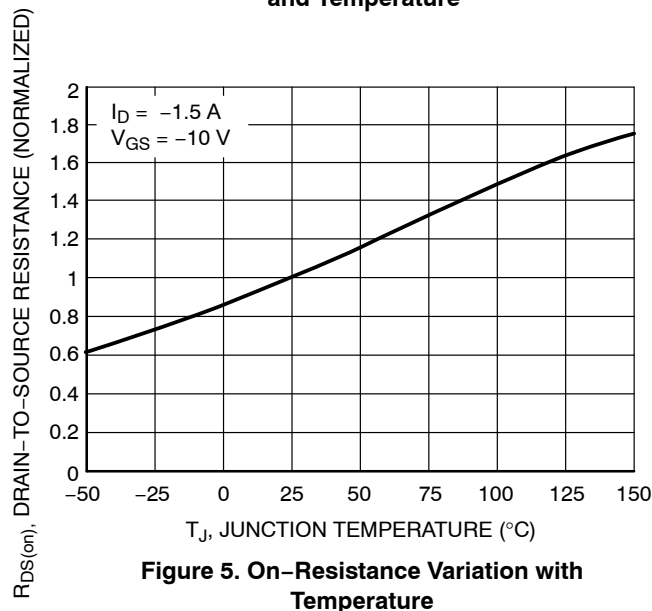
**Figure 2. Transfer Characteristics**



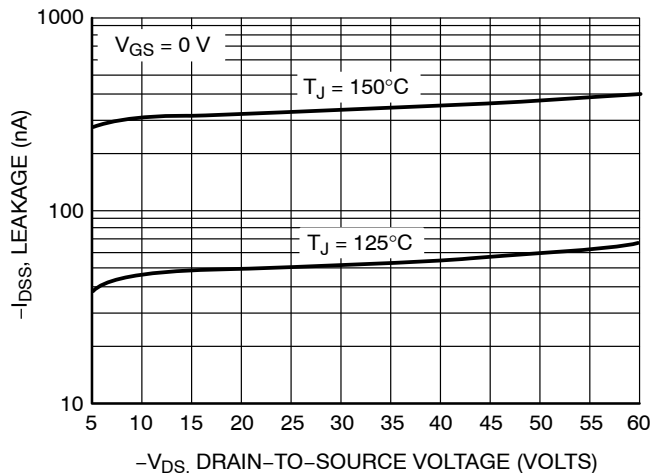
**Figure 3. On-Resistance versus Drain Current and Temperature**



**Figure 4. On-Resistance versus Drain Current and Gate Voltage**



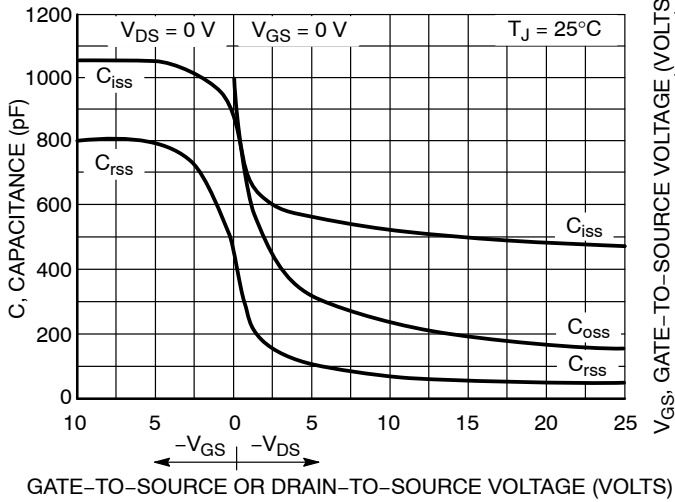
**Figure 5. On-Resistance Variation with Temperature**



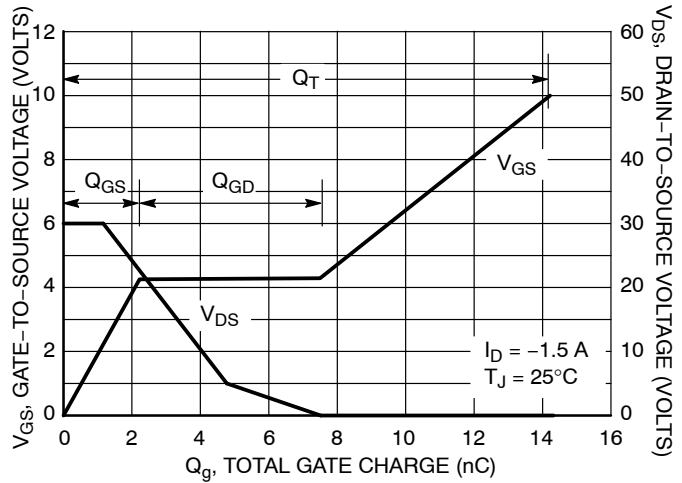
**Figure 6. Drain-to-Source Leakage Current versus Voltage**

**NTF2955, NVF2955**

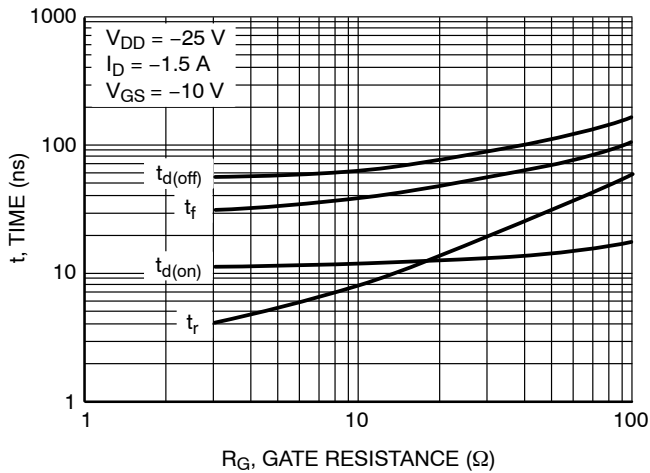
**TYPICAL PERFORMANCE CURVES** ( $T_J = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)



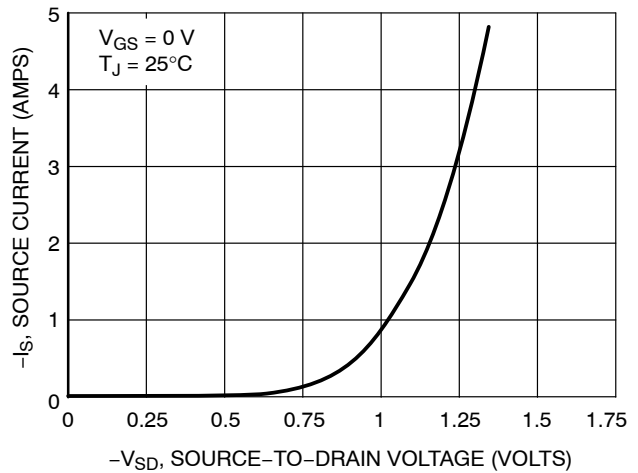
**Figure 7. Capacitance Variation**



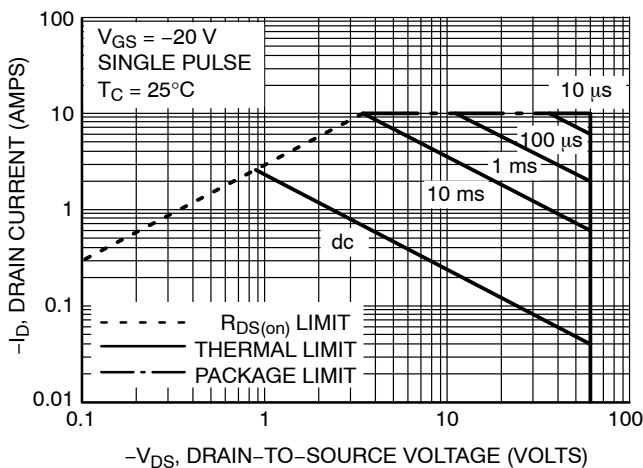
**Figure 8. Gate-to-Source and Drain-to-Source Voltage versus Total Charge**



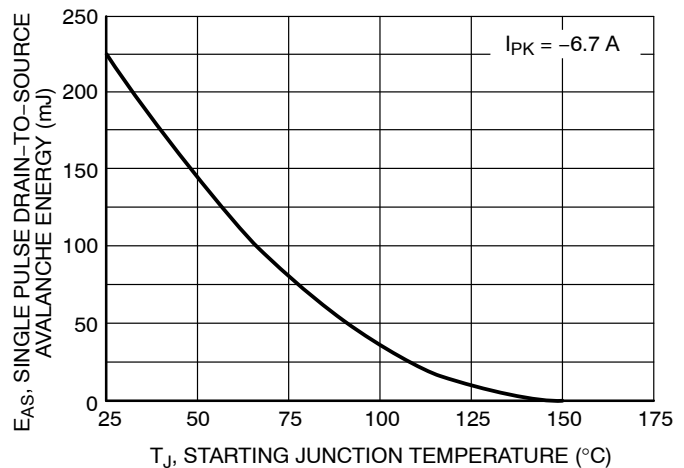
**Figure 9. Resistive Switching Time Variation versus Gate Resistance**



**Figure 10. Diode Forward Voltage versus Current**



**Figure 11. Maximum Rated Forward Biased Safe Operating Area**



**Figure 12. Maximum Avalanche Energy versus Starting Junction Temperature**

### NTF2955, NVF2955

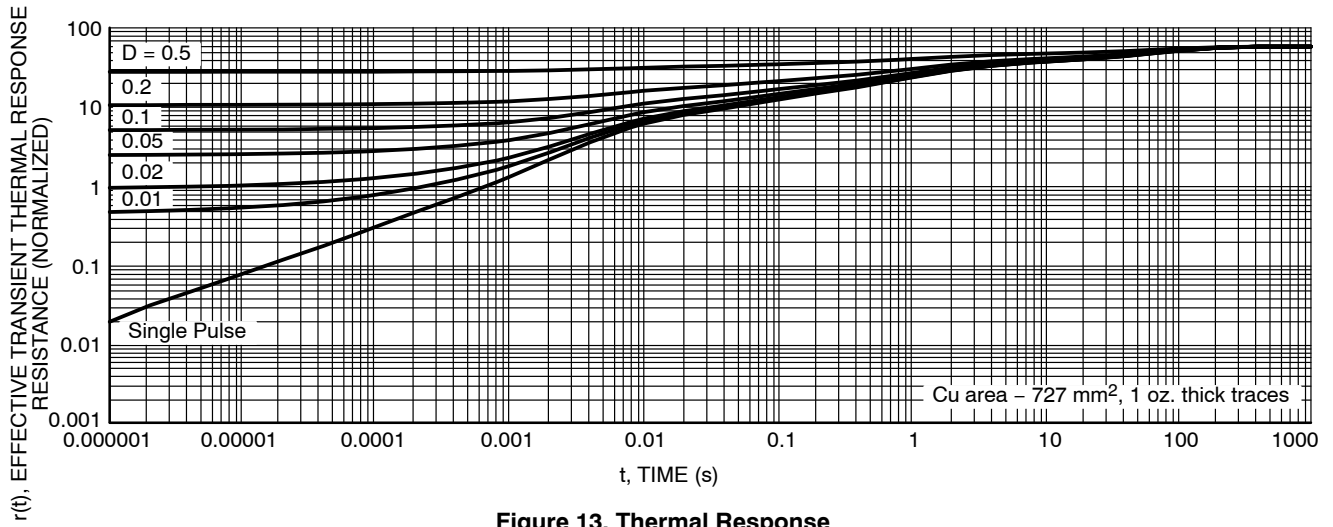


Figure 13. Thermal Response



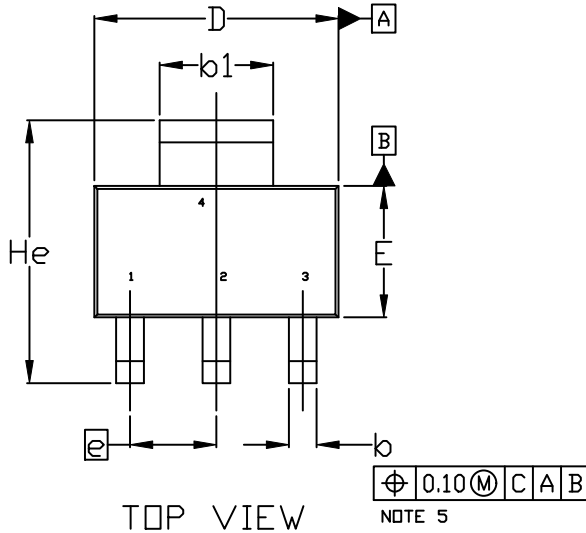
**MECHANICAL CASE OUTLINE**  
**PACKAGE DIMENSIONS**



SCALE 1:1

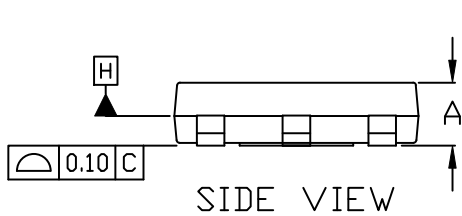
**SOT-223 (TO-261)**  
**CASE 318E-04**  
**ISSUE R**

DATE 02 OCT 2018

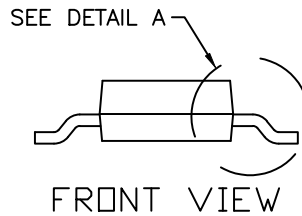


TOP VIEW

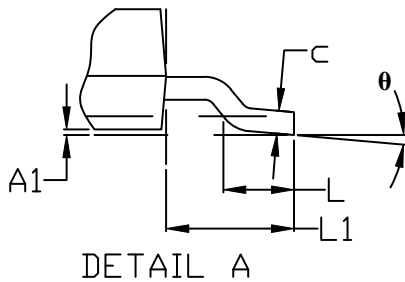
$\oplus 0.10 \text{ (M)} \text{ C A B}$   
NOTE 5



SIDE VIEW



FRONT VIEW

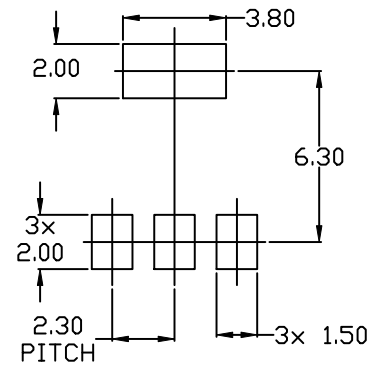


DETAIL A

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS D & E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.200MM PER SIDE.
4. DATUMS A AND B ARE DETERMINED AT DATUM H.
5. A1 IS DEFINED AS THE VERTICAL DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT OF THE PACKAGE BODY.
6. POSITIONAL TOLERANCE APPLIES TO DIMENSIONS b AND b1.

MILLIMETERS			
DIM	MIN.	NOM.	MAX.
A	1.50	1.63	1.75
A1	0.02	0.06	0.10
b	0.60	0.75	0.89
b1	2.90	3.06	3.20
c	0.24	0.29	0.35
D	6.30	6.50	6.70
E	3.30	3.50	3.70
e	2.30 BSC		
L	0.20	---	---
L1	1.50	1.75	2.00
He	6.70	7.00	7.30
$\theta$	0°	---	10°



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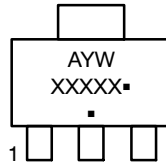


**SOT-223 (TO-261)**  
**CASE 318E-04**  
**ISSUE R**

DATE 02 OCT 2018

- |   |  |  |  |  |
|---|--|--|--|--|
| <p><b>STYLE 1:</b><br/>                 PIN 1. BASE<br/>                 2. COLLECTOR<br/>                 3. EMITTER<br/>                 4. COLLECTOR</p> | <p><b>STYLE 2:</b><br/>                 PIN 1. ANODE<br/>                 2. CATHODE<br/>                 3. NC<br/>                 4. CATHODE</p>        | <p><b>STYLE 3:</b><br/>                 PIN 1. GATE<br/>                 2. DRAIN<br/>                 3. SOURCE<br/>                 4. DRAIN</p>           | <p><b>STYLE 4:</b><br/>                 PIN 1. SOURCE<br/>                 2. DRAIN<br/>                 3. GATE<br/>                 4. DRAIN</p>   | <p><b>STYLE 5:</b><br/>                 PIN 1. DRAIN<br/>                 2. GATE<br/>                 3. SOURCE<br/>                 4. GATE</p>    |
| <p><b>STYLE 6:</b><br/>                 PIN 1. RETURN<br/>                 2. INPUT<br/>                 3. OUTPUT<br/>                 4. INPUT</p>        | <p><b>STYLE 7:</b><br/>                 PIN 1. ANODE 1<br/>                 2. CATHODE<br/>                 3. ANODE 2<br/>                 4. CATHODE</p> | <p><b>STYLE 8:</b><br/>                 CANCELLED</p>  | <p><b>STYLE 9:</b><br/>                 PIN 1. INPUT<br/>                 2. GROUND<br/>                 3. LOGIC<br/>                 4. GROUND</p> | <p><b>STYLE 10:</b><br/>                 PIN 1. CATHODE<br/>                 2. ANODE<br/>                 3. GATE<br/>                 4. ANODE</p> |
| <p><b>STYLE 11:</b><br/>                 PIN 1. MT 1<br/>                 2. MT 2<br/>                 3. GATE<br/>                 4. MT 2</p>             | <p><b>STYLE 12:</b><br/>                 PIN 1. INPUT<br/>                 2. OUTPUT<br/>                 3. NC<br/>                 4. OUTPUT</p>         | <p><b>STYLE 13:</b><br/>                 PIN 1. GATE<br/>                 2. COLLECTOR<br/>                 3. EMITTER<br/>                 4. COLLECTOR</p> |  |  |

**GENERIC MARKING DIAGRAM\***



- A = Assembly Location
- Y = Year
- W = Work Week
- XXXXX = Specific Device Code
- = Pb-Free Package

(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

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