Power MOSFET

3.0 A, 60 V, Logic Level, N–Channel SOT–223

Designed for low voltage, high speed switching applications in power supplies, converters and power motor controls and bridge circuits.

Features

- NVF Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC–Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

Applications

- Power Supplies
- Converters
- Power Motor Controls
- Bridge Circuits

MAXIMUM RATINGS (T_C = 25° C unless otherwise noted)

Rating	Symbol	Value	Unit			
Drain-to-Source Voltage	V _{DSS}	60	Vdc			
Drain-to-Gate Voltage (R_{GS} = 1.0 M Ω)	V _{DGR}	60	Vdc			
Gate–to–Source Voltage – Continuous – Non–repetitive (t _p ≤ 10 ms)	V _{GS}	± 15 ± 20	Vdc Vpk			
$ \begin{array}{l} \text{Drain Current} \\ - \text{ Continuous } @ \ T_A = 25^\circ\text{C} \ (\text{Note 1}) \\ - \text{ Continuous } @ \ T_A = 100^\circ\text{C} \ (\text{Note 2}) \\ - \text{ Single Pulse} \ (t_p \leq 10 \ \mu\text{s}) \end{array} $	I _D I _D I _{DM}	3.0 1.4 9.0	Adc Apk			
Total Power Dissipation @ $T_A = 25^{\circ}C$ (Note 1) Total Power Dissipation @ $T_A = 25^{\circ}C$ (Note 2) Derate above $25^{\circ}C$	P _D	2.1 1.3 0.014	Watts Watts W/°C			
Operating and Storage Temperature Range	T _J , T _{stg}	-55 to 175	°C			
$ Single Pulse Drain-to-Source Avalanche \\ Energy - Starting T_J = 25^\circ C \\ (V_{DD} = 25 \ Vdc, \ V_{GS} = 5.0 \ Vdc, \\ I_{L(pk)} = 7.0 \ Apk, \ L = 3.0 \ mH, \ V_{DS} = 60 \ Vdc) $	E _{AS}	74	mJ			
Thermal Resistance –Junction–to–Ambient (Note 1) –Junction–to–Ambient (Note 2)	R _{θJA} R _{θJA}	72.3 114	°C/W			
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	ΤL	260	°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.

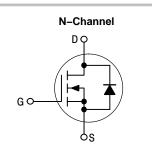
- 1. When surface mounted to an FR4 board using 1" pad size, 1 oz. (Cu. Area 1 in²).
- When surface mounted to an FR4 board using minimum recommended pad size, 2 oz. (Cu. Area 0.272 in²).



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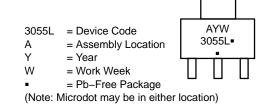
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3.0 A, 60 V R_{DS(on)} = 120 mΩ

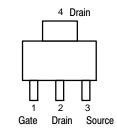




MARKING DIAGRAM



PIN ASSIGNMENT



ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

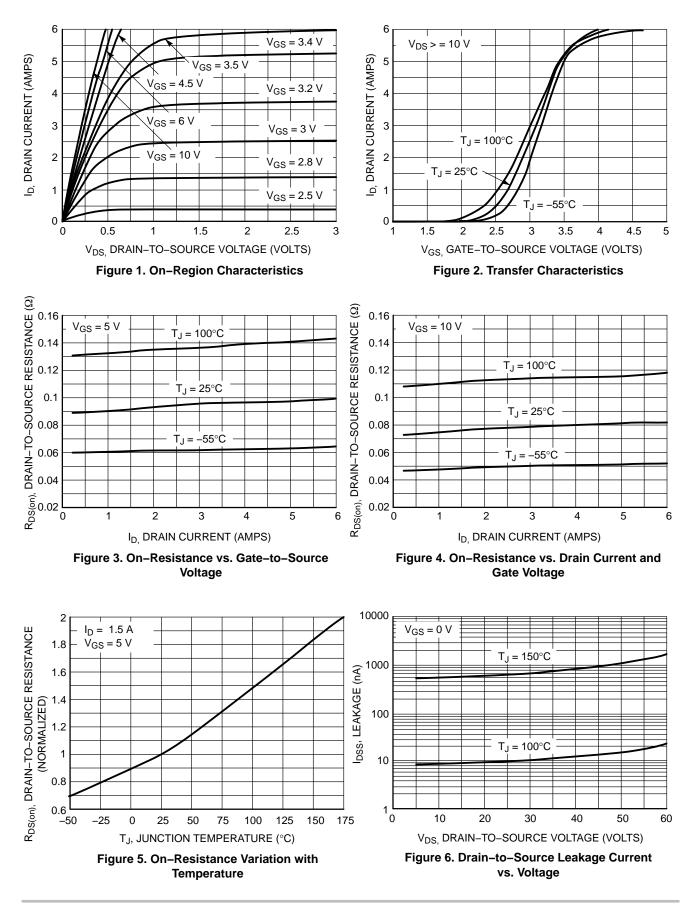
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Charact	Symbol	Min	Тур	Max	Unit	
OFF CHARACTERISTICS						
Drain–to–Source Breakdown Voltage (V _{GS} = 0 Vdc, I _D = 250 μAdc) Temperature Coefficient (Positive)	V _{(BR)DSS}	60 -	68 68		Vdc mV/°C	
Zero Gate Voltage Drain Current ($V_{DS} = 60 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}$) ($V_{DS} = 60 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, T_J = 1$					1.0 10	μAdc
Gate-Body Leakage Current (VGS	I _{GSS}	-	-	± 100	nAdc	
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage (Note 3) $(V_{DS} = V_{GS}, I_D = 250 \ \mu Adc)$ Threshold Temperature Coefficient (Negative)			1.0 _	1.68 4.6	2.0 _	Vdc mV/°C
Static Drain-to-Source On-Resistant (V _{GS} = 5.0 Vdc, I _D = 1.5 Adc)	R _{DS(on)}	-	92	120	mΩ	
$ Static Drain-to-Source On-Resistant \\ (V_{GS} = 5.0 \ Vdc, \ I_D = 3.0 \ Adc) \\ (V_{GS} = 5.0 \ Vdc, \ I_D = 1.5 \ Adc, \ T_J = 1.5 \ Adc,$	V _{DS(on)}	_	0.290 0.250	0.43 -	Vdc	
Forward Transconductance (Note 3)	9 _{fs}	-	5.7	-	Mhos	
OYNAMIC CHARACTERISTICS						
Input Capacitance		C _{iss}	-	313	440	pF
Output Capacitance	(V _{DS} = 25 Vdc, V _{GS} = 0 V, f = 1.0 MHz)	C _{oss}	-	112	160	
Transfer Capacitance	,	C _{rss}	-	40	60	
WITCHING CHARACTERISTICS (No	ote 4)					
Turn-On Delay Time		t _{d(on)}	-	11	25	ns
Rise Time	(V _{DD} = 30 Vdc, I _D = 3.0 Adc, V _{GS} = 5.0 Vdc,	t _r	-	35	70	
Turn–Off Delay Time	$R_{G} = 9.1 \Omega$ (Note 3)	t _{d(off)}	-	22	45	
Fall Time		t _f	-	27	60	1
Gate Charge	(V _{DS} = 48 Vdc, I _D = 3.0 Adc, V _{GS} = 5.0 Vdc) (Note 3)	Q _T	-	7.6	15	nC
		Q ₁	-	1.4	-	-
		Q ₂	-	4.0	-	
SOURCE-DRAIN DIODE CHARACTE	RISTICS					
Forward On-Voltage		V _{SD}		0.87 0.72	1.0 -	Vdc
Reverse Recovery Time		t _{rr}	-	35	-	ns
	(I _S = 3.0 Adc, V _{GS} = 0 Vdc, dI _S /dt = 100 A/µs) (Note 3)	ta	-	21	-	1
		t _b	-	14	-	1
Reverse Recovery Stored Charge	Q _{RR}	-	0.044	_	μC	

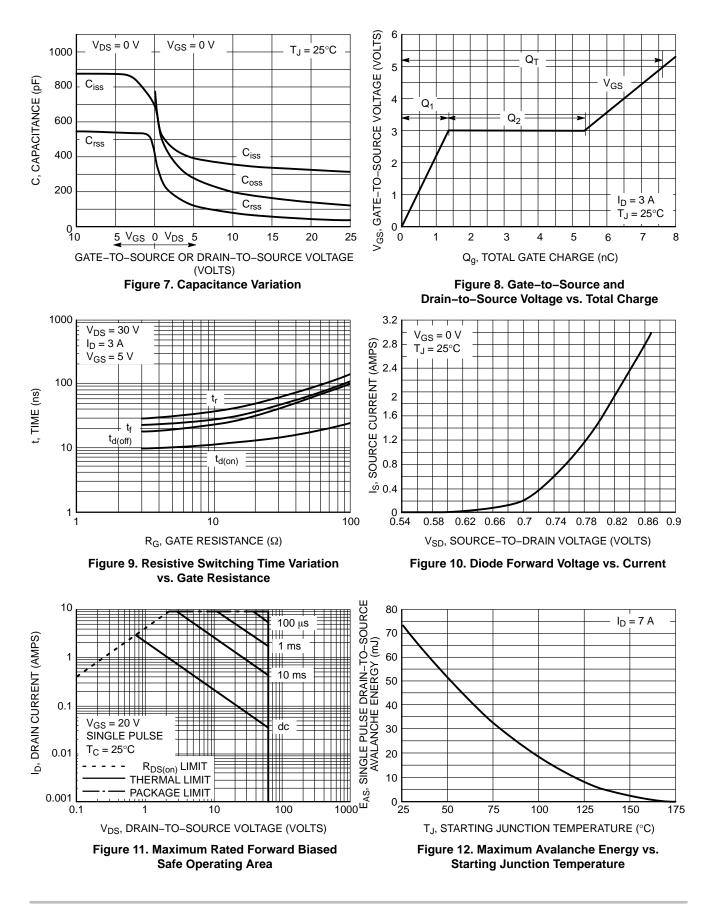
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
Switching characteristics are independent of operating junction temperatures.

TYPICAL ELECTRICAL CHARACTERISTICS



TYPICAL ELECTRICAL CHARACTERISTICS



TYPICAL ELECTRICAL CHARACTERISTICS

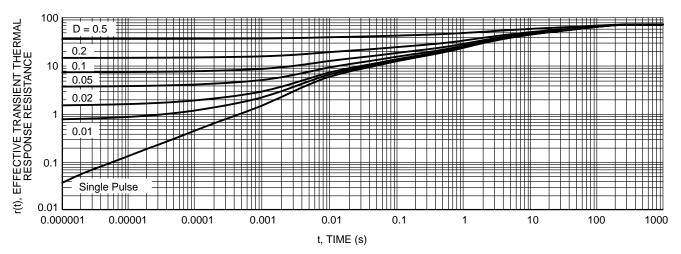


Figure 13. Thermal Response

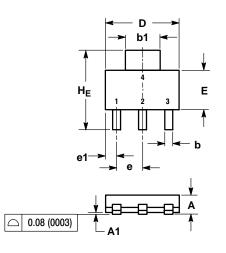
ORDERING INFORMATION

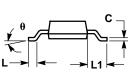
Device	Package	Shipping [†]
NTF3055L108T1G	SOT-223 (TO-261) (Pb-Free)	1000 / Tape & Reel
NVF3055L108T1G	SOT-223 (TO-261) (Pb-Free)	1000 / Tape & Reel

+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.

PACKAGE DIMENSIONS

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



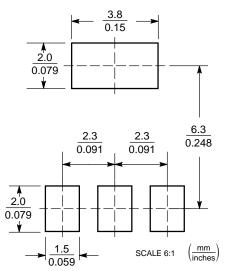


NOTES: 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994. 2. CONTROLLING DIMENSION: INCH.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
Α	1.50	1.63	1.75	0.060	0.064	0.068
A1	0.02	0.06	0.10	0.001	0.002	0.004
b	0.60	0.75	0.89	0.024	0.030	0.035
b1	2.90	3.06	3.20	0.115	0.121	0.126
С	0.24	0.29	0.35	0.009	0.012	0.014
D	6.30	6.50	6.70	0.249	0.256	0.263
Е	3.30	3.50	3.70	0.130	0.138	0.145
е	2.20	2.30	2.40	0.087	0.091	0.094
e1	0.85	0.94	1.05	0.033	0.037	0.041
L	0.20			0.008		
L1	1.50	1.75	2.00	0.060	0.069	0.078
HE	6.70	7.00	7.30	0.264	0.276	0.287
θ		-			-	
STYLE 3:						
	1. Gate 2. Drian		10°	0°		10°
	3. SOURCE					

4. DRAIN





*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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