

MOSFET – Power, N-Channel

100 V, 32 A, 37 mΩ

NTD6414AN, NVD6414AN

Features

- Low $R_{DS(on)}$
- High Current Capability
- 100% Avalanche Tested
- NVD 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

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	100	V
Gate-to-Source Voltage – Continuous	V_{GS}	± 20	V
Continuous Drain Current $R_{\theta JC}$	I_D	$T_C = 25^\circ\text{C}$	32
		$T_C = 100^\circ\text{C}$	22
Power Dissipation $R_{\theta JC}$	P_D	100	W
Pulsed Drain Current	$t_p = 10 \mu\text{s}$	I_{DM}	117
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +175	$^\circ\text{C}$
Source Current (Body Diode)	I_S	32	A
Single Pulse Drain-to-Source Avalanche Energy ($V_{DD} = 50 \text{ Vdc}$, $V_{GS} = 10 \text{ Vdc}$, $I_{L(pk)} = 32 \text{ A}$, $L = 0.3 \text{ mH}$, $R_G = 25 \Omega$)	E_{AS}	154	mJ
Lead Temperature for Soldering Purposes, 1/8" from Case for 10 Seconds	T_L	260	$^\circ\text{C}$

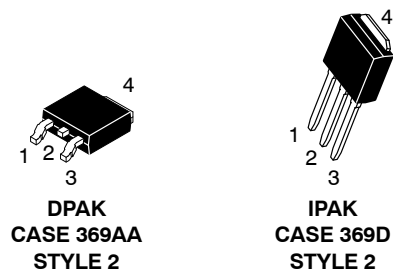
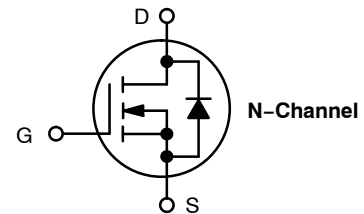
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL RESISTANCE RATINGS

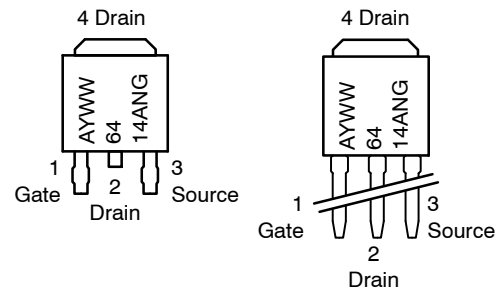
Parameter	Symbol	Max	Unit
Junction-to-Case (Drain) Steady State	$R_{\theta JC}$	1.5	$^\circ\text{C/W}$
Junction-to-Ambient (Note 1)	$R_{\theta JA}$	37	

1. Surface mounted on FR4 board using 1 sq in pad size, (Cu Area 1.127 sq in [1 oz] including traces).

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX (Note 1)
100 V	37 mΩ @ 10 V	32 A



MARKING DIAGRAM & PIN ASSIGNMENTS



- A = Assembly Location*
- Y = Year
- WW = Work Week
- 6414AN = Device Code
- G = Pb-Free Package

* The Assembly Location code (A) is front side optional. In cases where the Assembly Location is stamped in the package, the front side assembly code may be blank.

ORDERING INFORMATION

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

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 5.

NTD6414AN, NVD6414AN

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	100			V	
Drain-to-Source Breakdown Voltage Temperature Coefficient	V _{(BR)DSS} /T _J			107		mV/°C	
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V, V _{DS} = 100 V	T _J = 25°C			1.0	μA
			T _J = 125°C				100
Gate-to-Source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V				±100	nA

ON CHARACTERISTICS (Note 3)

Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250 μA	2.0		4.0	V
Negative Threshold Temperature Coefficient	V _{GS(TH)} /T _J			8.3		mV/°C
Drain-to-Source On-Resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 32 A		30	37	mΩ
Forward Transconductance	g _{FS}	V _{GS} = 5.0 V, I _D = 10 A		18		S

CHARGES, CAPACITANCES AND GATE RESISTANCE

Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0 MHz, V _{DS} = 25 V		1450		pF
Output Capacitance	C _{OSS}			230		
Reverse Transfer Capacitance	C _{RSS}			95		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 10 V, V _{DS} = 80 V, I _D = 32 A		40		nC
Threshold Gate Charge	Q _{G(TH)}			1.7		
Gate-to-Source Charge	Q _{GS}			8.0		
Gate-to-Drain Charge	Q _{GD}			20		
Plateau Voltage	V _{GP}			5.9		
Gate Resistance	R _G			1.9		Ω

SWITCHING CHARACTERISTICS (Note 4)

Turn-On Delay Time	t _{d(on)}	V _{GS} = 10 V, V _{DD} = 80 V, I _D = 32 A, R _G = 6.1 Ω		11		ns
Rise Time	t _r			52		
Turn-Off Delay Time	t _{d(off)}			38		
Fall Time	t _f			48		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V _{SD}	V _{GS} = 0 V, I _S = 32 A	T _J = 25°C	0.87	1.2	V
			T _J = 125°C	0.76		
Reverse Recovery Time	t _{RR}	V _{GS} = 0 V, dI _S /dt = 100 A/μs, I _S = 32 A		68		ns
Charge Time	T _a			51		
Discharge Time	T _b			16		
Reverse Recovery Charge	Q _{RR}			195		

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.

2. Surface mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces).

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

4. Switching characteristics are independent of operating junction temperatures.

NTD6414AN, NVD6414AN

TYPICAL CHARACTERISTICS

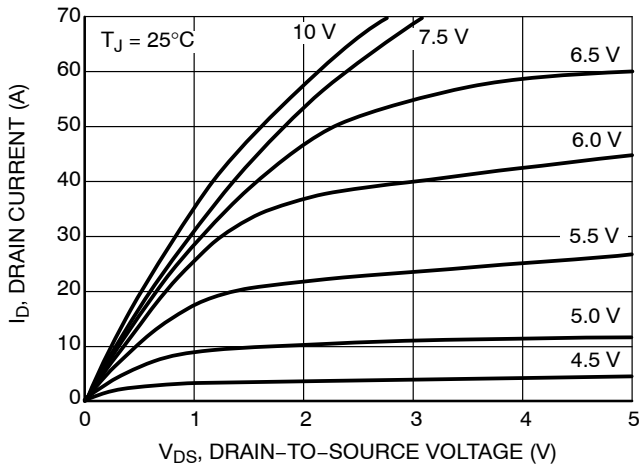


Figure 1. On-Region Characteristics

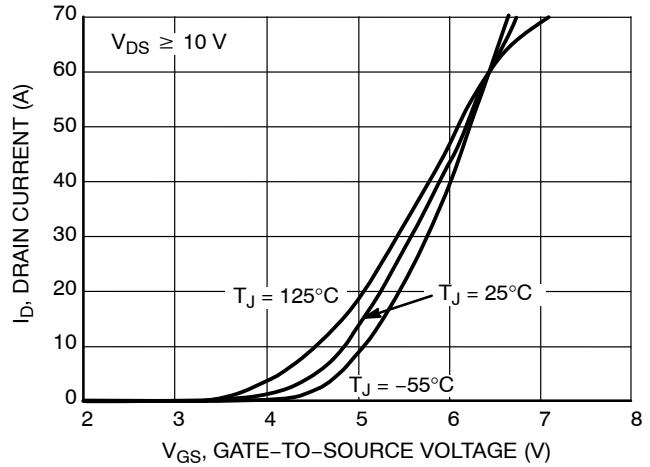


Figure 2. Transfer Characteristics

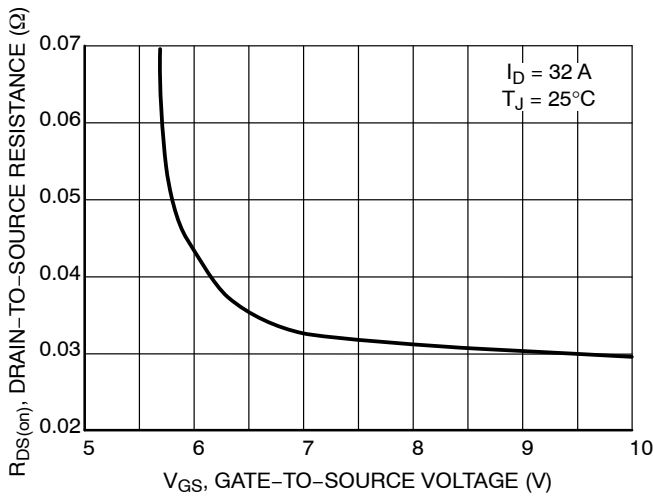


Figure 3. On-Region versus Gate Voltage

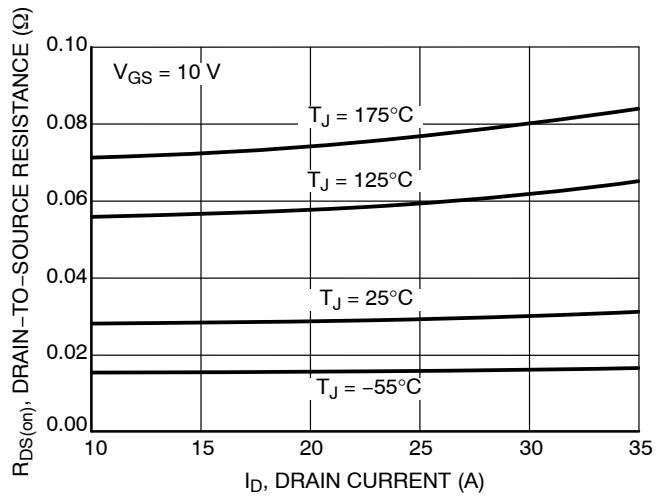


Figure 4. On-Resistance versus Drain Current and Gate Voltage

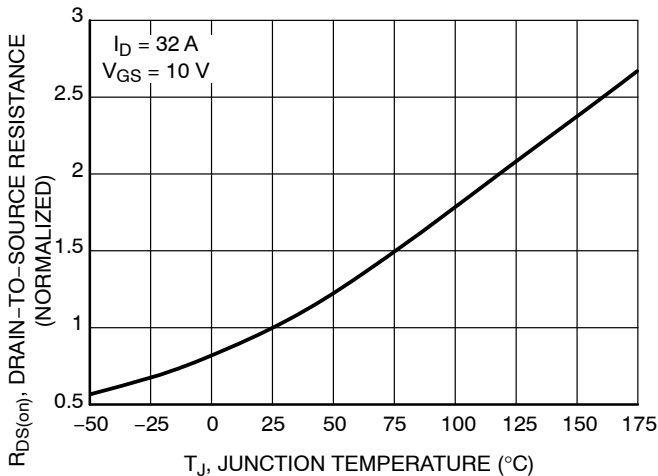


Figure 5. On-Resistance Variation with Temperature

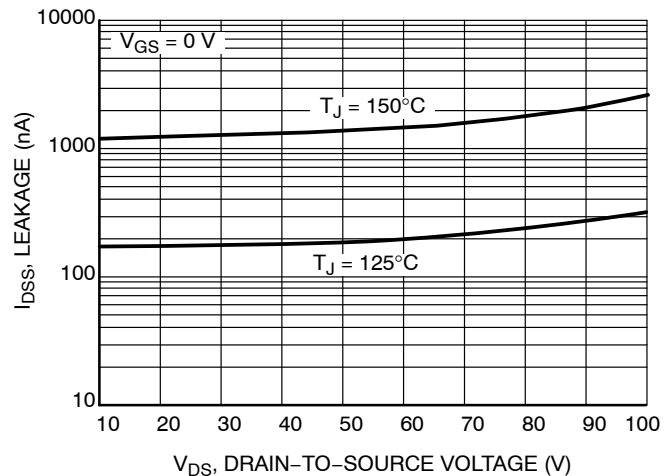


Figure 6. Drain-to-Source Leakage Current versus Voltage

NTD6414AN, NVD6414AN

TYPICAL CHARACTERISTICS

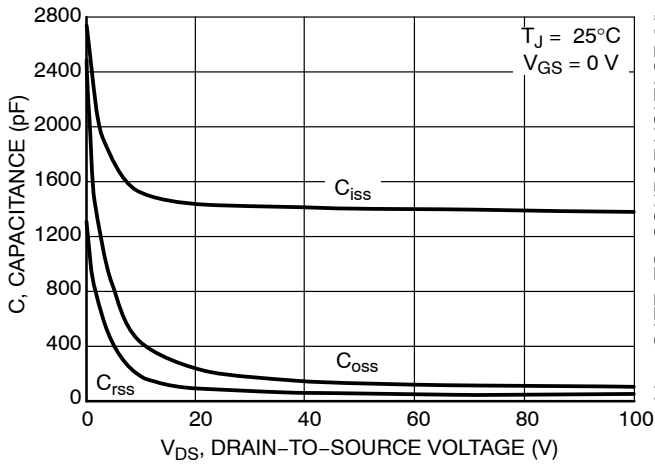


Figure 7. Capacitance Variation

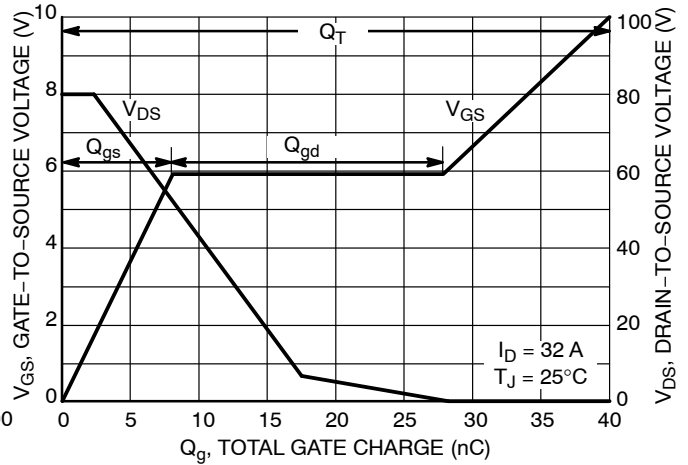


Figure 8. Gate-to-Source Voltage and Drain-to-Source Voltage versus Total Charge

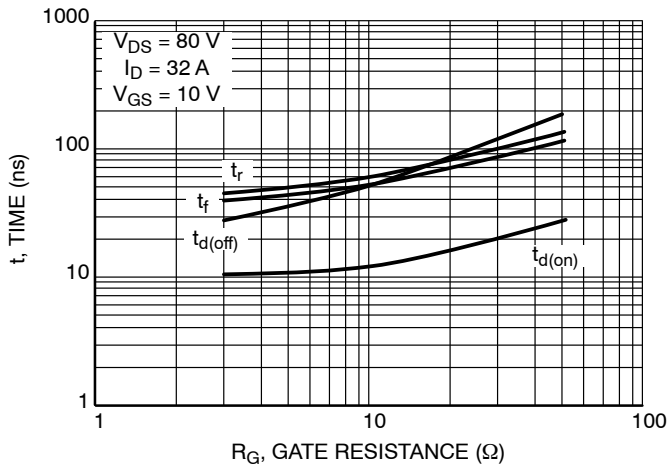


Figure 9. Resistive Switching Time Variation versus Gate Resistance

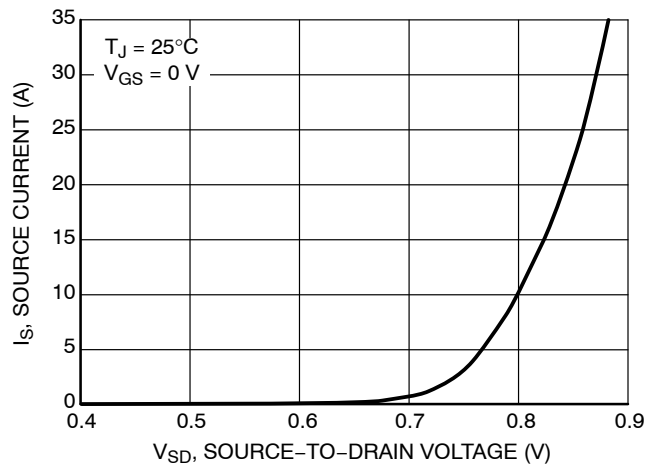


Figure 10. Diode Forward Voltage versus Current

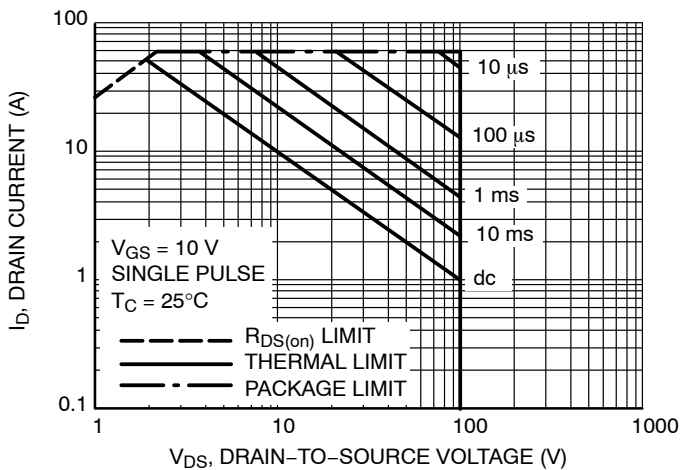


Figure 11. Maximum Rated Forward Biased Safe Operating Area

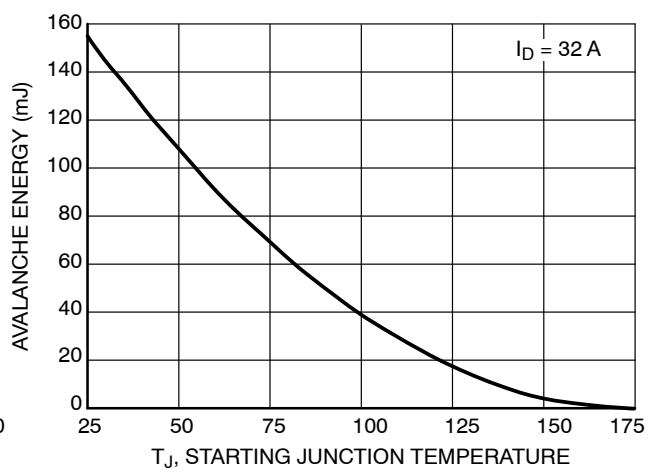


Figure 12. Maximum Avalanche Energy versus Starting Junction Temperature

NTD6414AN, NVD6414AN

TYPICAL CHARACTERISTICS

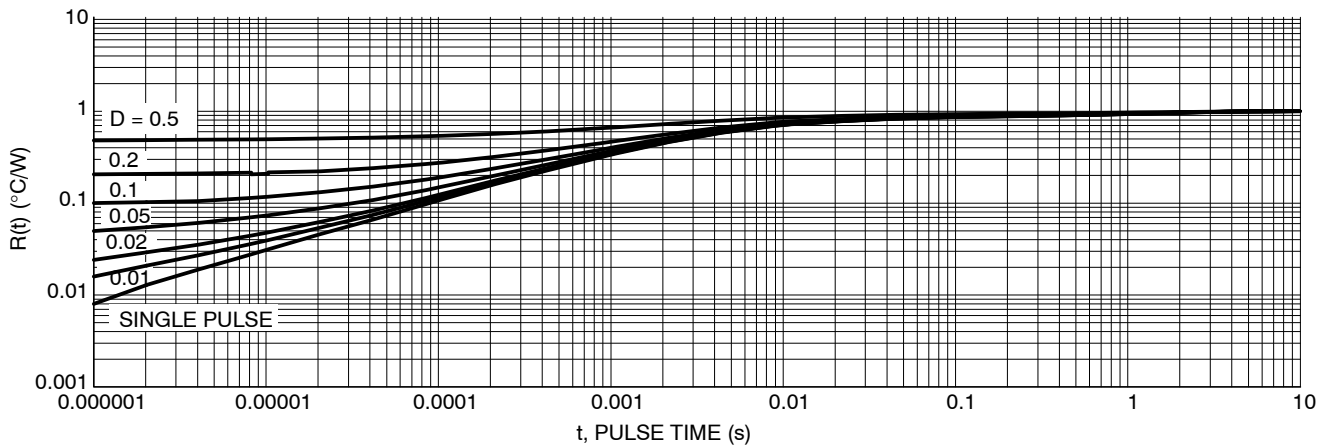


Figure 13. Thermal Response

ORDERING INFORMATION

Device	Package	Shipping†
NTD6414ANT4G	DPAK (Pb-Free)	2500 / Tape & Reel

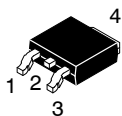
DISCONTINUED (Note 5)

NTD6414AN-1G	IPAK (Pb-Free)	75 Units / Rail
NVD6414ANT4G*	DPAK (Pb-Free)	2500 / Tape & Reel

†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.

*NVD Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

5. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on www.onsemi.com.



DPAK-3 6.10x6.54x2.28, 2.29P
CASE 369AA
ISSUE C

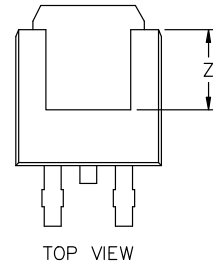
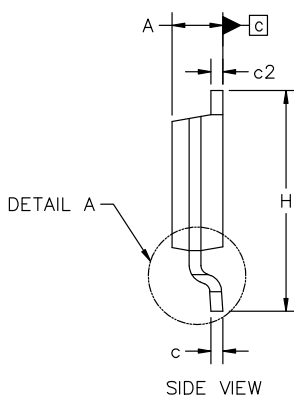
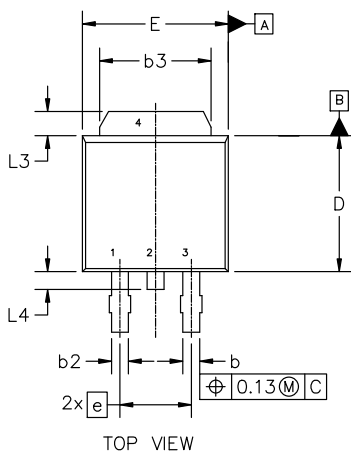
DATE 14 MAY 2026

SCALE 1:1

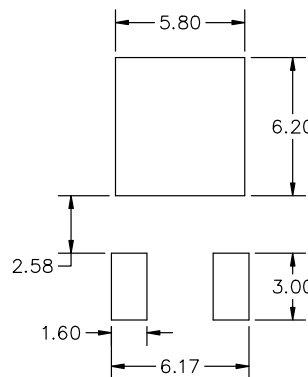
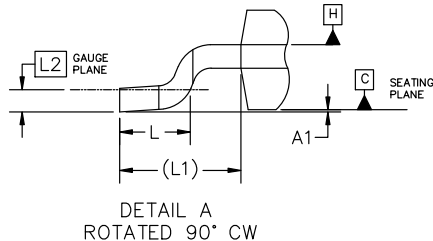
NOTES

1. DIMENSION AND TOLERANCING PER ASME Y14.5 2018
2. CONTROLLING DIMENSION: MILLIMETERS
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSION b3, L3, AND Z
4. DIMENSION D AND E DO NOT INCLUDED MOLD FLASH, PROTRUSION, OR BURRS.
5. DIMENSION D AND E ARE DETERMINED AT OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H

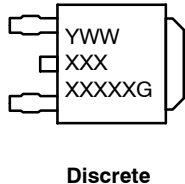
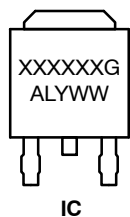
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	2.18	2.28	2.38
A1	0.00	---	0.13
b	0.63	0.76	0.89
b2	0.76	0.95	1.14
b3	4.57	5.02	5.46
c	0.46	0.54	0.61
c2	0.46	0.54	0.61
D	5.97	6.10	6.22
E	6.35	6.54	6.73
e	2.29 BSC		
H	9.40	9.91	10.41
L	1.40	1.59	1.78
L1	2.74 REF		
L2	0.51 BSC		
L3	0.89	---	1.27
L4	---	---	1.01
Z	3.93	---	---



RECOMMENDED MOUNTING FOOTPRINT



GENERIC MARKING DIAGRAM*



- XXXXXX = Device Code
- A = Assembly Location
- L = Wafer Lot
- Y = Year
- WW = Work Week
- G = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.

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DESCRIPTION:	DPAK-3 6.10x6.54x2.28, 2.29P	PAGE 1 OF 1

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