THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction−to−Case (Drain)	$R_{\theta JC}$	4.6	°C/W
Junction−to−TAB (Drain)	$R_{\theta JC-TAB}$	3.5	
Junction−to−Ambient − Steady State (Note 1)	$R_{\theta JA}$	78	
Junction−to−Ambient − Steady State (Note 2)	$R_{\theta JA}$	119	

1. Surface−mounted on FR4 board using 1 sq−in pad, 1 oz Cu.
2. Surface−mounted on FR4 board using the minimum recommended pad size.

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

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
OFF CHARACTERISTICS							
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 μA		30			V
Drain−to−Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$				25		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = 24 V	T_J = 25 °C			1	μA
			T_J = 125°C			10	
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		1.5		2.5	V
Negative Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$				5.6		mV/°C
Drain−to−Source On Resistance	$R_{DS(on)}$	V_{GS} = 10 V to 11.5 V	I_D = 30 A		12	15	mΩ
			I_D = 15 A		11.5		
		V_{GS} = 4.5 V	I_D = 30 A		21	25	
			I_D = 15 A		18.3		
Forward Transconductance	g_{FS}	V_{DS} = 15 V, I_D = 10 A			6.0		S
CHARGES AND CAPACITANCES							
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0 MHz, V_{DS} = 12 V			770		pF
Output Capacitance	C_{OSS}				181		
Reverse Transfer Capacitance	C_{RSS}				108		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 4.5 V, V_{DS} = 15 V; I_D = 30 A			6.0	6.6	nC
Threshold Gate Charge	$Q_{G(TH)}$				0.9		
Gate−to−Source Charge	Q_{GS}				2.5		
Gate−to−Drain Charge	Q_{GD}				3.1		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 11.5 V, V_{DS} = 15 V; I_D = 30 A			14.1		nC
SWITCHING CHARACTERISTICS (Note 4)							
Turn−On Delay Time	$t_{d(ON)}$	V_{GS} = 4.5 V, V_{DS} = 15 V, I_D = 15 A, R_G = 3.0 Ω			10.5		ns
Rise Time	t_r				21.4		
Turn−Off Delay Time	$t_{d(OFF)}$				11.4		
Fall Time	t_f				3.5		

3. Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.
4. Switching characteristics are independent of operating junction temperatures.

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

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
SWITCHING CHARACTERISTICS (Note 4)							
Turn−On Delay Time	$t_{d(ON)}$	V_{GS} = 11.5 V, V_{DS} = 15 V, I_D = 15 A, R_G = 3.0 Ω			6.3		ns
Rise Time	t_r				17.6		
Turn−Off Delay Time	$t_{d(OFF)}$				18.4		
Fall Time	t_f				2.3		
DRAIN−SOURCE DIODE CHARACTERISTICS							
Forward Diode Voltage	V_{SD}	V_{GS} = 0 V, I_S = 30 A	T_J = 25°C		1.0	1.2	V
			T_J = 125°C		0.92		
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, dIS/dt = 100 A/μs, I_S = 30 A			15.3		ns
Charge Time	t_a				8.7		
Discharge Time	t_b				6.6		
Reverse Recovery Charge	Q_{RR}				5.5		nC
PACKAGE PARASITIC VALUES							
Source Inductance	L_S	T_A = 25°C			2.49		nH
Drain Inductance, DPAK	L_D				0.0164		
Drain Inductance, IPAK	L_D				1.88		
Gate Inductance	L_G				3.46		
Gate Resistance	R_G				2.6		Ω

3. Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.
4. Switching characteristics are independent of operating junction temperatures.

TYPICAL PERFORMANCE CURVES

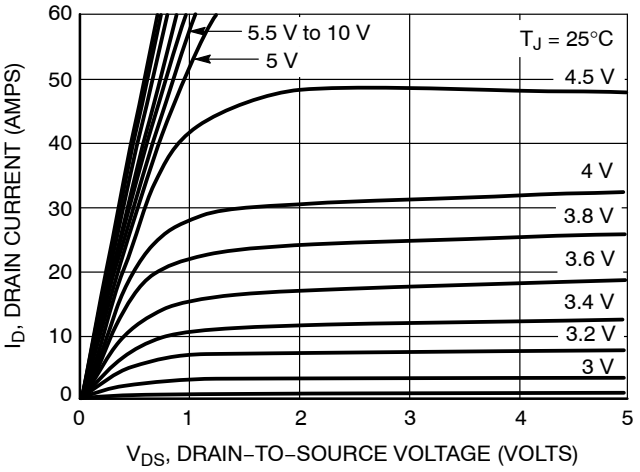


Figure 1. On−Region Characteristics

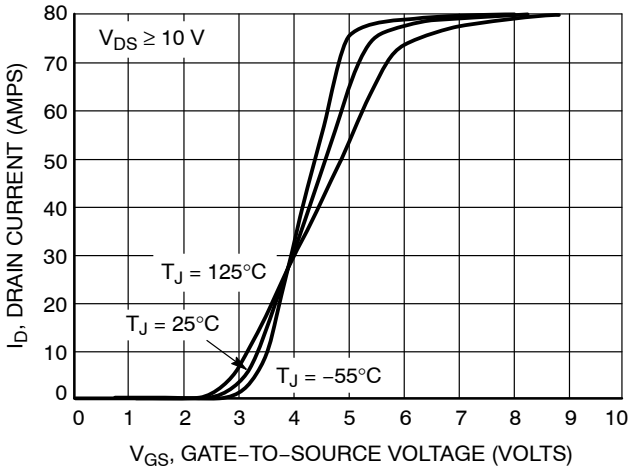


Figure 2. Transfer Characteristics

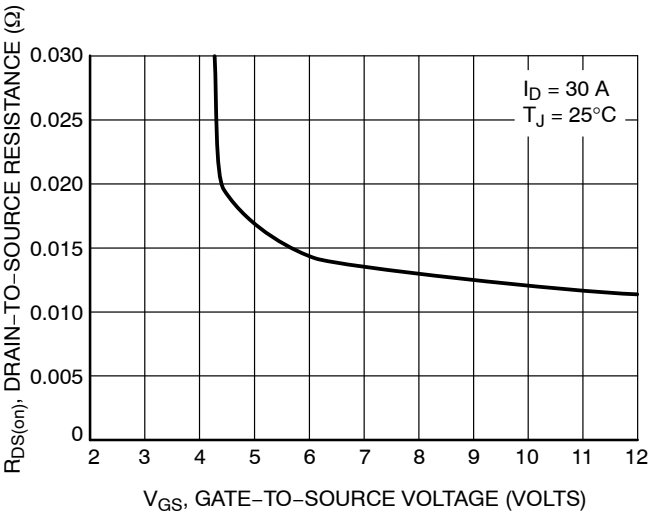


Figure 3. On−Resistance vs. Gate−to−Source Voltage

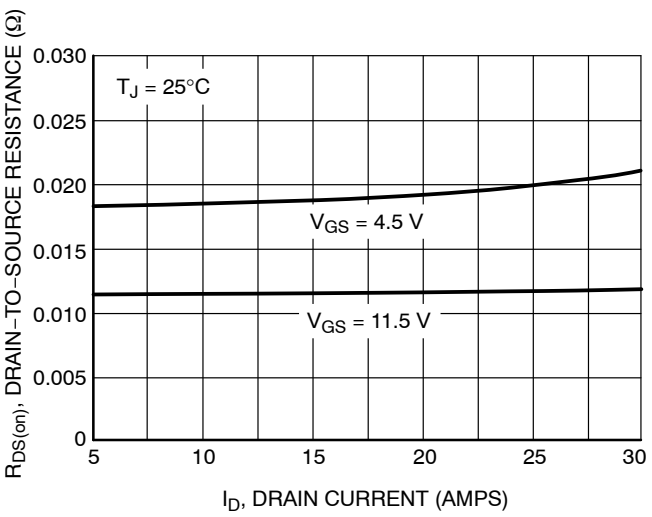


Figure 4. On−Resistance vs. Drain Current and Gate Voltage

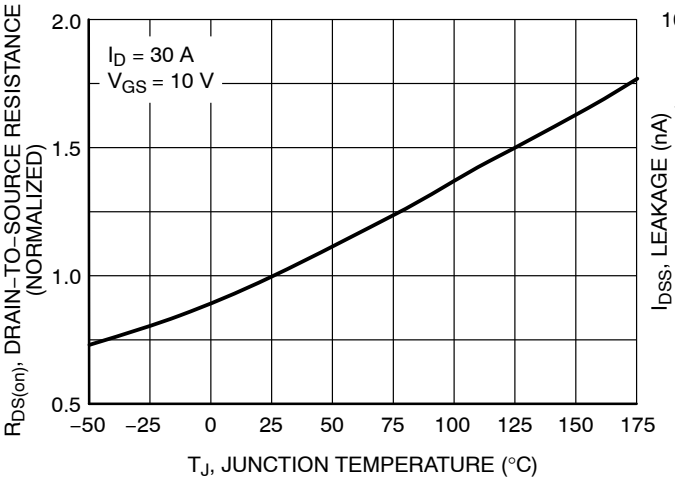


Figure 5. On−Resistance Variation with Temperature

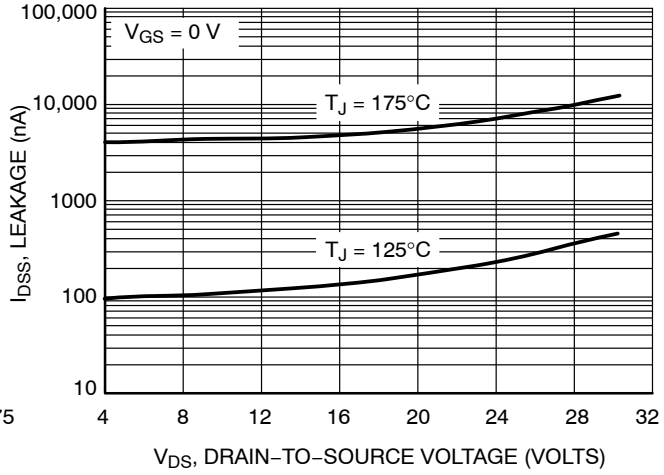


Figure 6. Drain−to−Source Leakage Current vs. Drain Voltage

TYPICAL PERFORMANCE CURVES

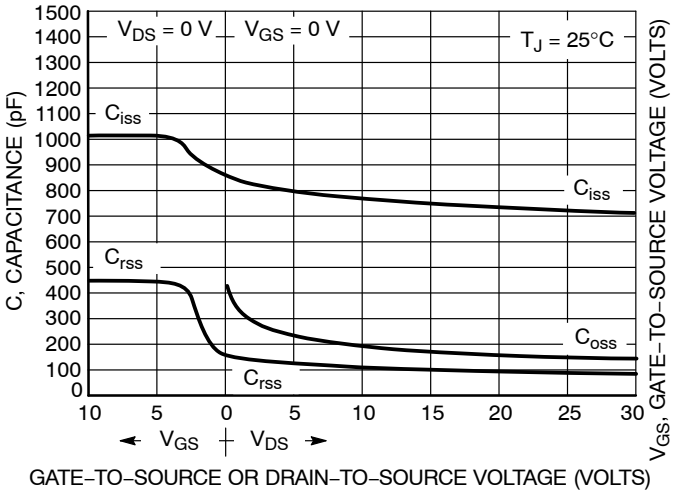


Figure 7. Capacitance Variation

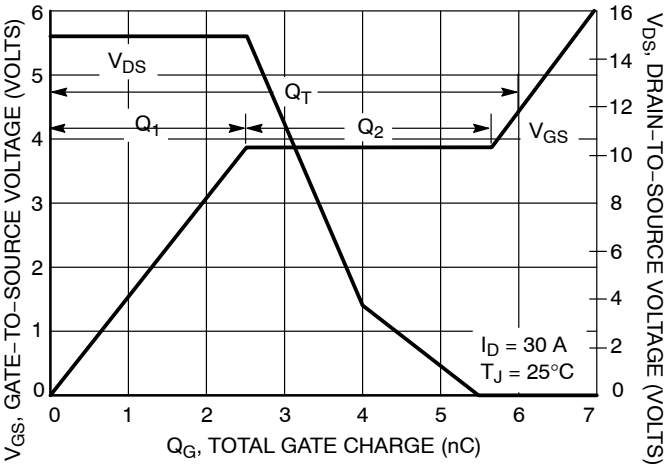


Figure 8. Gate–To–Source and Drain–To–Source Voltage vs. Total Charge

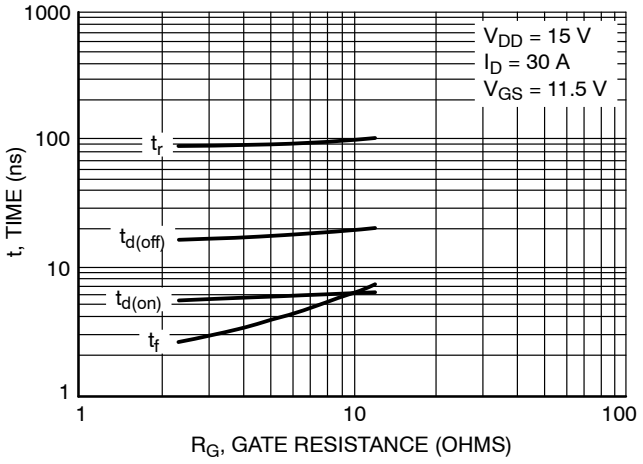


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

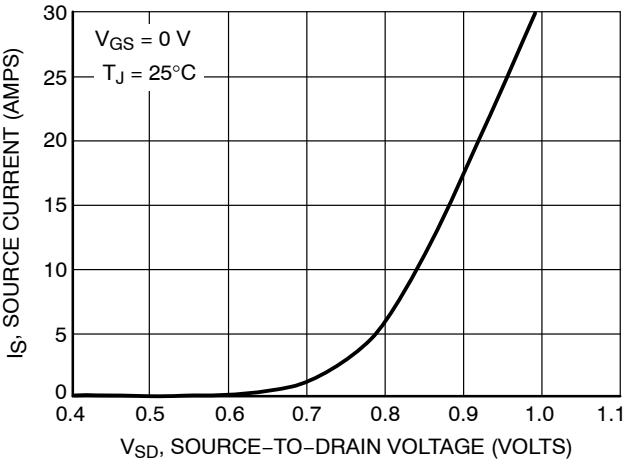


Figure 10. Diode Forward Voltage vs. Current

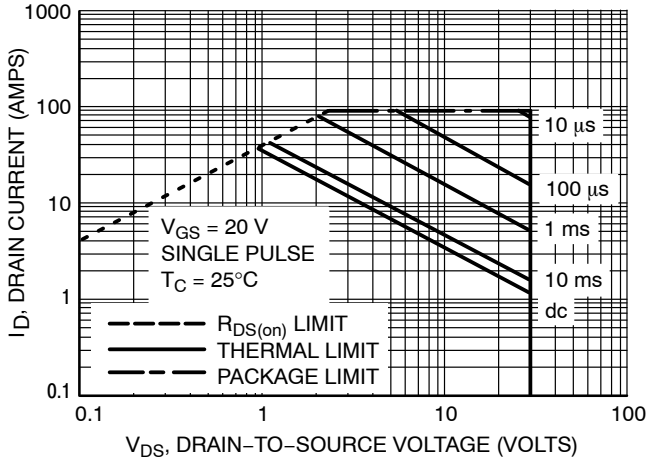


Figure 11. Maximum Rated Forward Biased Safe Operating Area

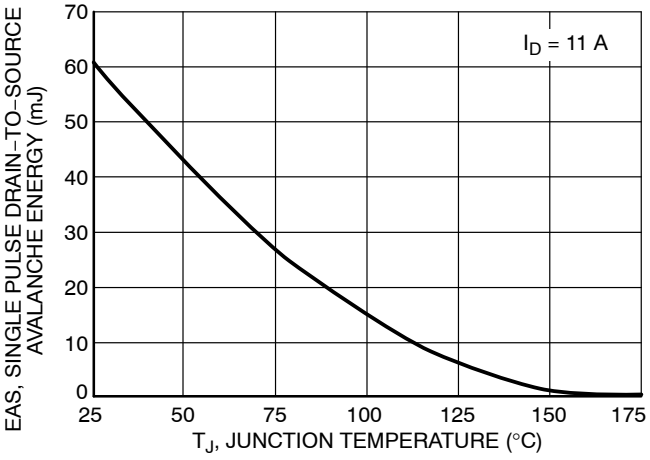


Figure 12. Maximum Avalanche Energy vs. Starting Junction Temperature

TYPICAL PERFORMANCE CURVES

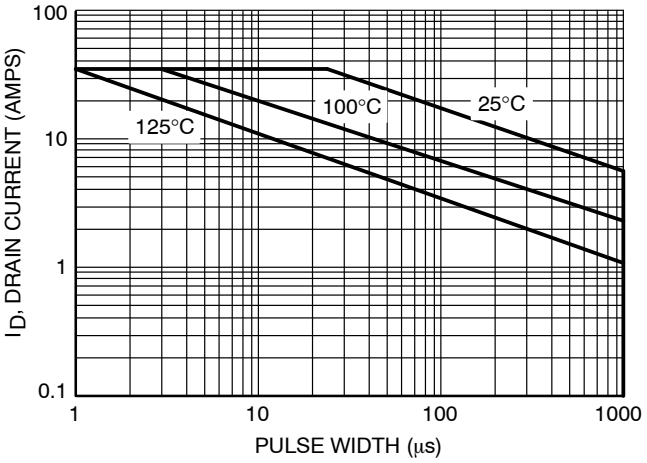


Figure 13. Avalanche Characteristics

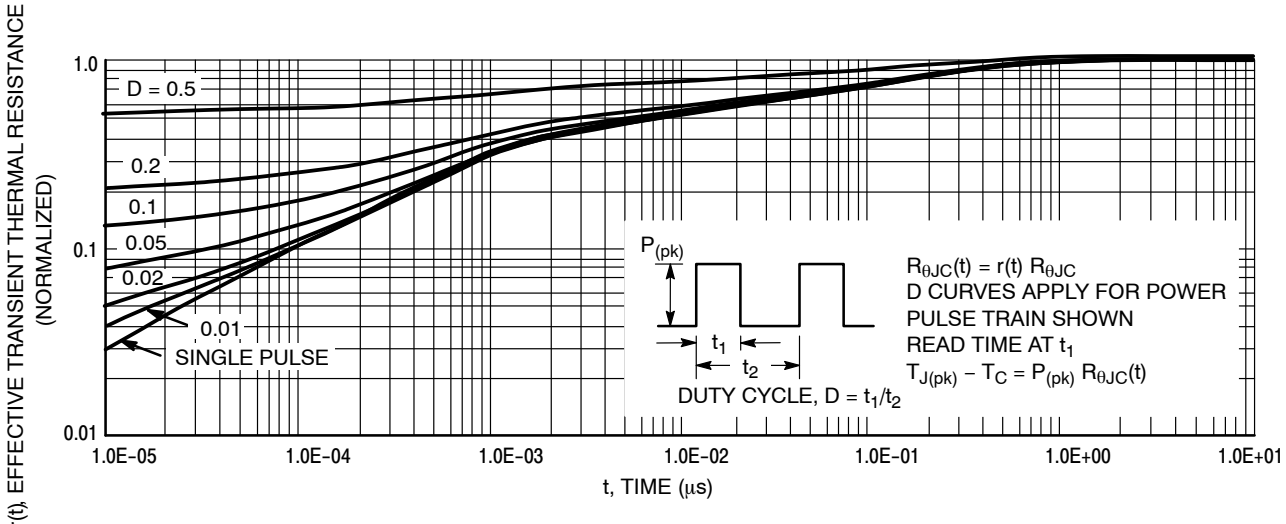


Figure 14. Thermal Response

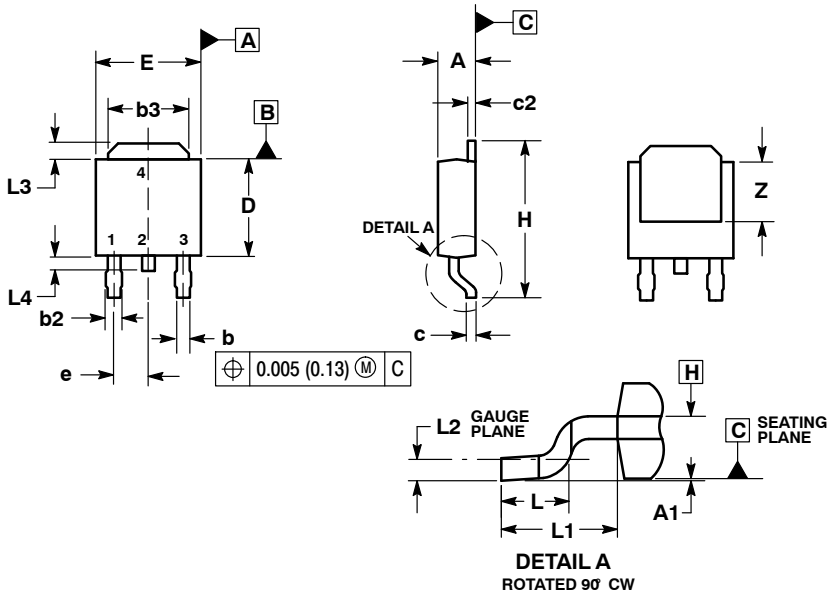
ORDERING INFORMATION

Device	Package	Shipping†
NTD4815NT4G	DPAK (Pb−Free)	2500 / Tape & Reel
NTD4815NT4H	DPAK (Pb−Free, Halide−Free)	2500 / Tape & Reel
NTD4815N−1G	IPAK (Pb−Free)	75 Units / Rail
NTD4815N−35G	IPAK Trimmed Lead (3.5 ± 0.15 mm) (Pb−Free)	75 Units / Rail

†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

DPAK (SINGLE GUAGE)
CASE 369AA−01
ISSUE B

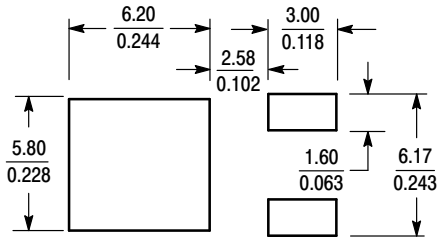


NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3 and Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.030	0.045	0.76	1.14
b3	0.180	0.215	4.57	5.46
c	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
E	0.250	0.265	6.35	6.73
e	0.090 BSC		2.29 BSC	
H	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.108 REF		2.74 REF	
L2	0.020 BSC		0.51 BSC	
L3	0.035	0.050	0.89	1.27
L4	−−−	0.040	−−−	1.01
Z	0.155	−−−	3.93	−−−

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

SOLDERING FOOTPRINT*

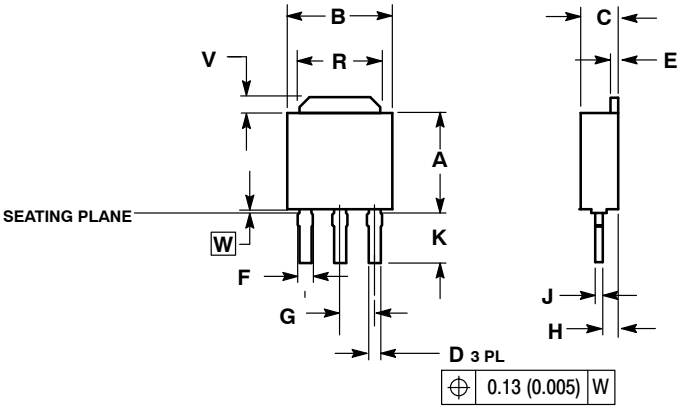


SCALE 3:1 (mm / inches)

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

PACKAGE DIMENSIONS

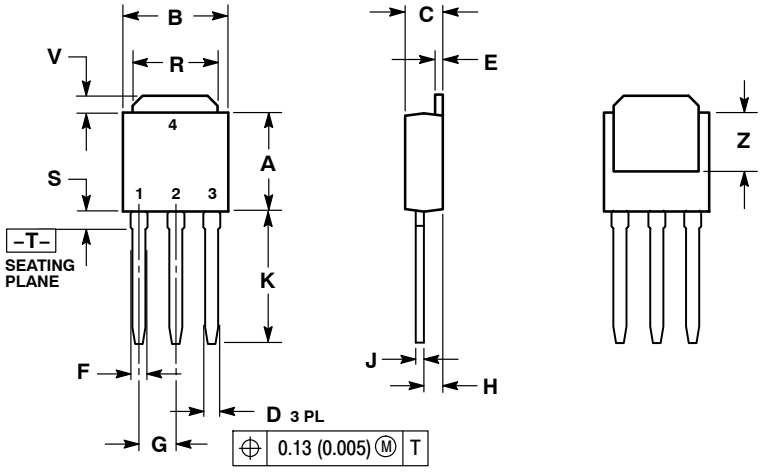
3 IPAK, STRAIGHT LEAD
CASE 369AC−01
ISSUE O



NOTES:
1.. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2.. CONTROLLING DIMENSION: INCH.
3. SEATING PLANE IS ON TOP OF DAMBAR POSITION.
4. DIMENSION A DOES NOT INCLUDE DAMBAR POSITION OR MOLD GATE.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.235	0.245	5.97	6.22
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.018	0.023	0.46	0.58
F	0.037	0.043	0.94	1.09
G	0.090 BSC		2.29 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.134	0.142	3.40	3.60
R	0.180	0.215	4.57	5.46
V	0.035	0.050	0.89	1.27
W	0.000	0.010	0.000	0.25

IPAK (STRAIGHT LEAD DPAK)
CASE 369D−01
ISSUE B



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.235	0.245	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
G	0.090 BSC		2.29 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.350	0.380	8.89	9.65
R	0.180	0.215	4.45	5.45
S	0.025	0.040	0.63	1.01
V	0.035	0.050	0.89	1.27
Z	0.155	−−−	3.93	−−−

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

PUBLICATION ORDERING INFORMATION

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