



## Description

### JMG N-channel MOSFET

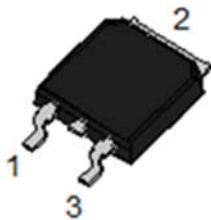
#### Features

- 100V,15A
- $R_{DS(ON)} < 75m\Omega$  (Max.) @  $V_{GS} = 10V$
- $R_{DS(ON)} < 300m\Omega$  (Max.) @  $V_{GS} = 4.5V$
- Low  $R_{DS(ON)}$ , Low Gate Charge
- Fast Switching
- Excellent Avalanche Characteristics

#### Application

- Motor Control and Drive
- Uninterruptible Power Supply (UPS)
- Battery Management

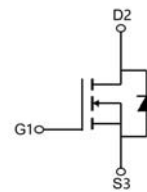
#### Package



TO-252(DPAK) top view



Marking and pin Assignment



Schematic Diagram

## Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	100	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C	15
		T <sub>C</sub> = 100°C	9
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	45	A
E <sub>AS</sub>	Single Pulsed Avalanche Energy <sup>note2</sup>	4.2	mJ
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25°C	17
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	7.4	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	62	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C



## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	100	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 25°C	-	-	1	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>GS</sub> = ±20V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1	2	3	V
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance <small>note3</small>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 5A	-	48	75	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 3A	-	100	150	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> = 5V, I <sub>D</sub> = 5A	-	8	-	S
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	429.4	-	pF
C <sub>oss</sub>	Output Capacitance		-	58.3	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	2.9	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = 50V, I <sub>D</sub> = 5A, V <sub>GS</sub> = 10V	-	7.6	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	1.4	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	2.4	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, I <sub>D</sub> = 5A, R <sub>G</sub> = 2Ω	-	15.6	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	4.2	-	ns
t <sub>d(off)</sub>	Turn-Off Delay Time		-	26.8	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	3.6	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	60	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>SD</sub> = 20A, T <sub>J</sub> = 25°C	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> = 0V, I <sub>S</sub> = 5A, di/dt = 100A/μs	-	36.1	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	50.4	-	nC

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. R<sub>G</sub> = 25Ω, L = 0.3mH, I<sub>AS</sub> = 5.3A, starting T<sub>J</sub> = 25°C.

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%



## Typical Performance Characteristics

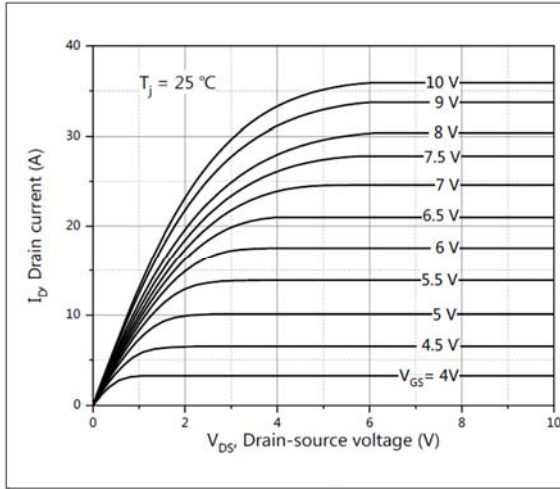


Figure 1, Typ. output characteristics

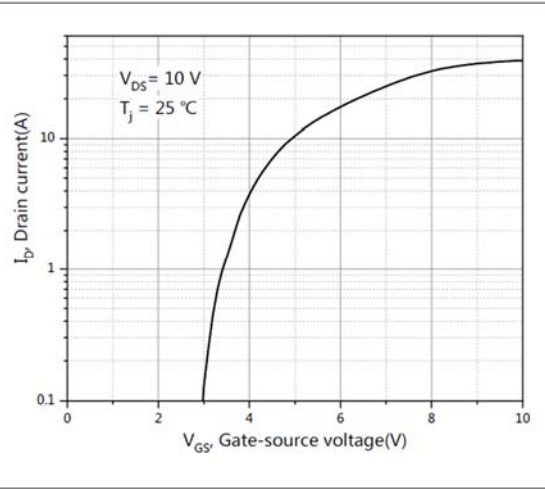


Figure 2, Typ. transfer characteristics

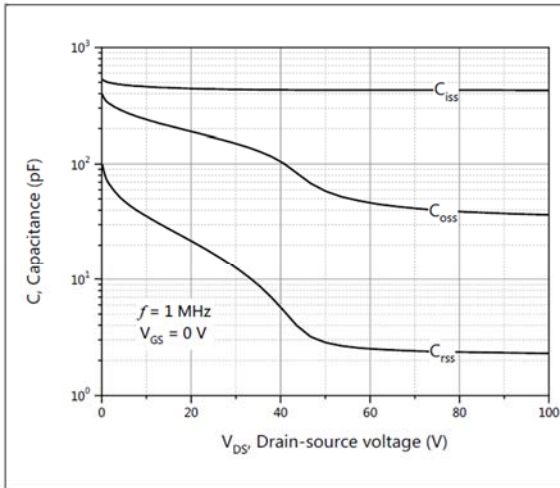


Figure 3, Typ. capacitances

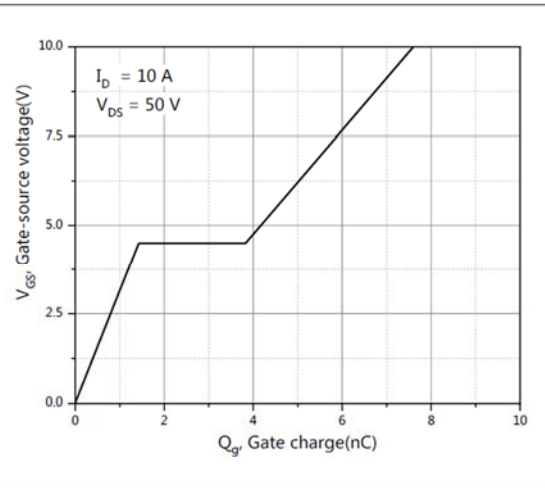


Figure 4, Typ. gate charge

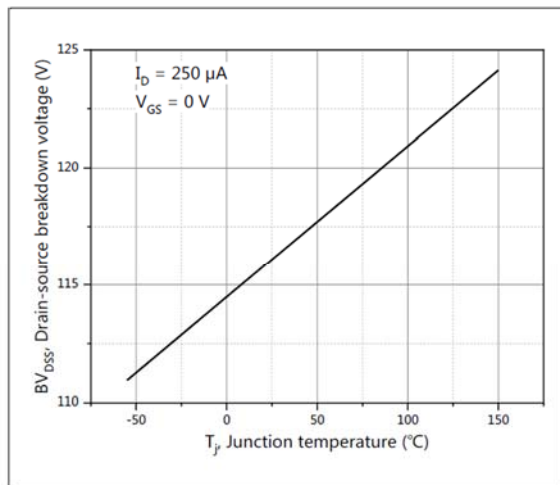


Figure 5, Drain-source breakdown voltage

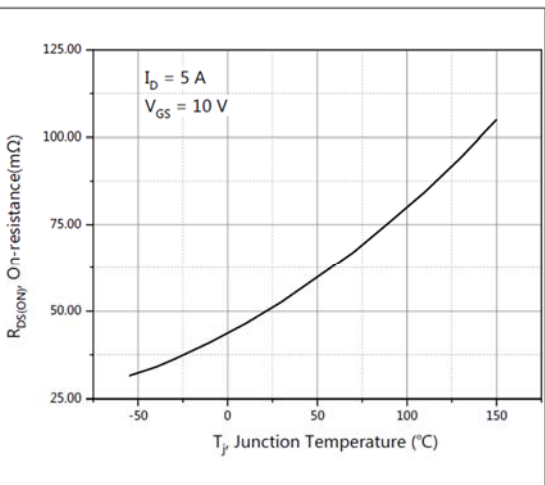


Figure 6, Drain-source on-state resistance

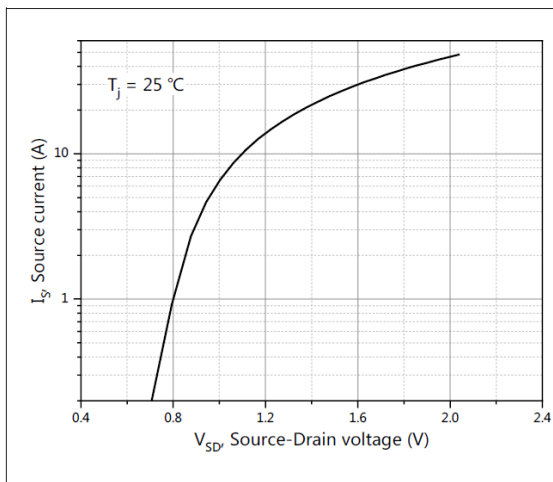


Figure 7, Forward characteristic of body diode

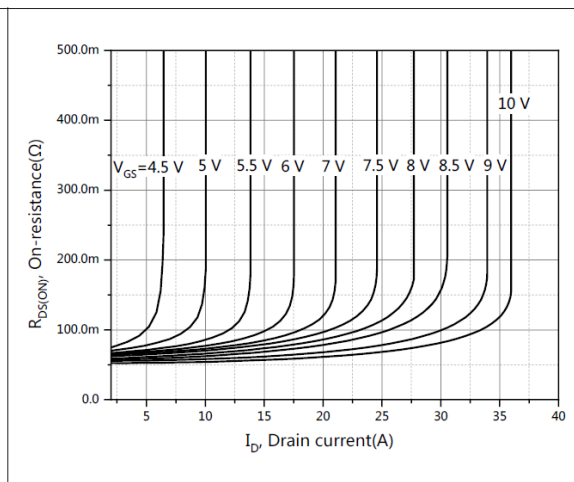


Figure 8, Drain-source on-state resistance

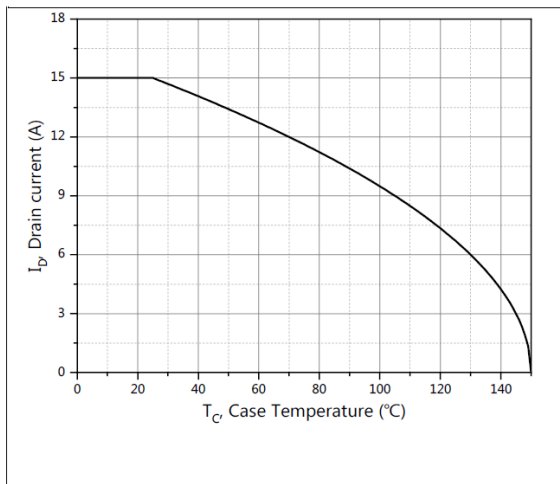


Figure 9, Drain current

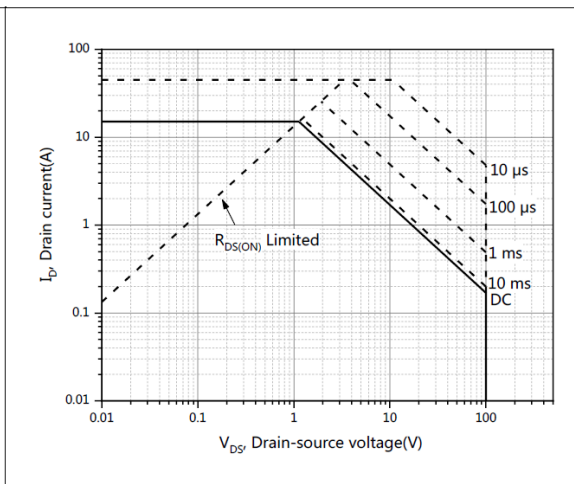


Figure 10, Safe operation area  $T_C=25\text{ }^{\circ}\text{C}$

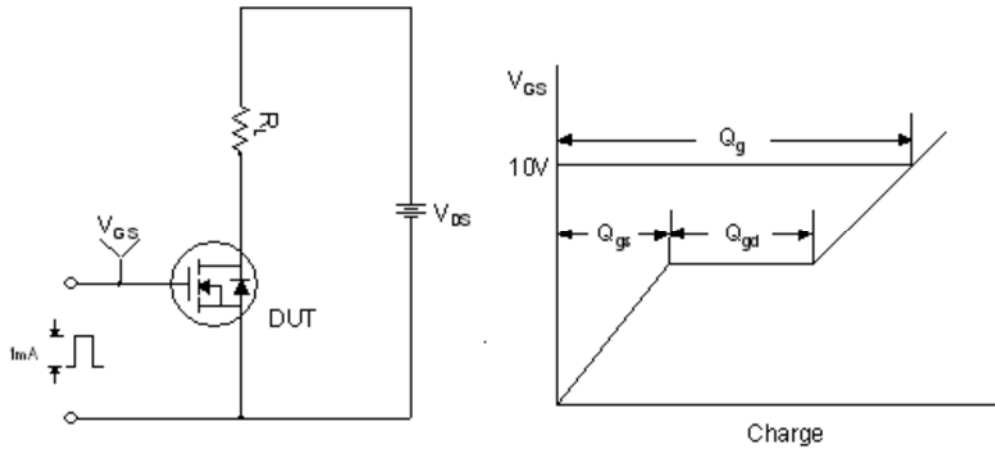


Figure 1. Gate Charge Test Circuit & Waveform

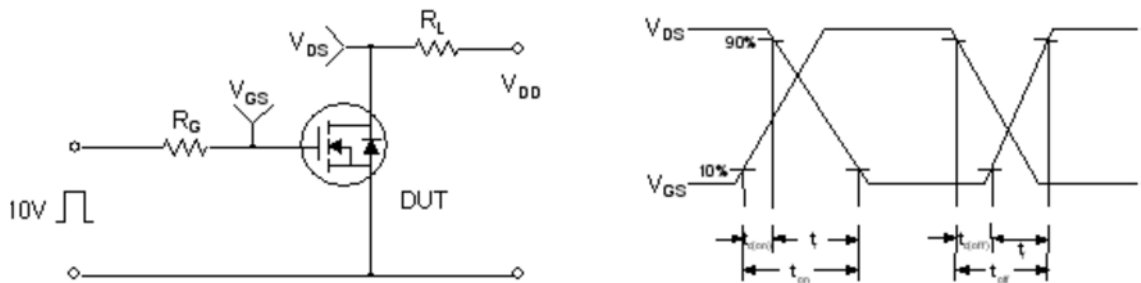


Figure 2. Resistive Switching Test Circuit & Waveforms

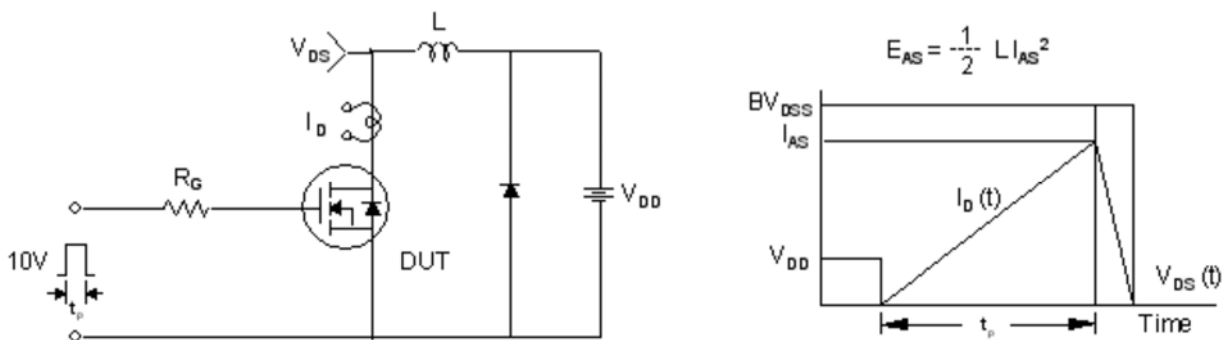


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

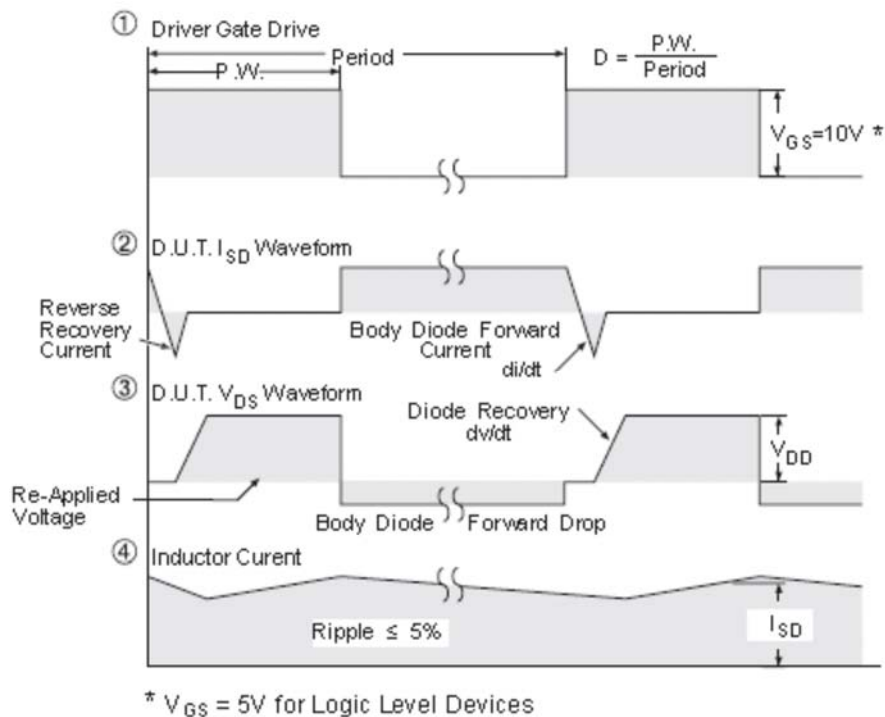
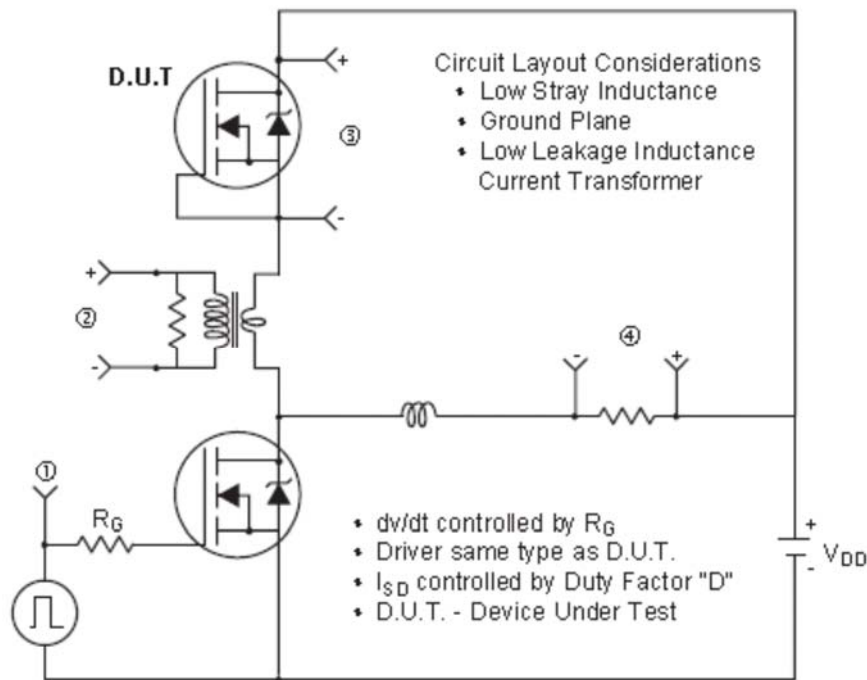
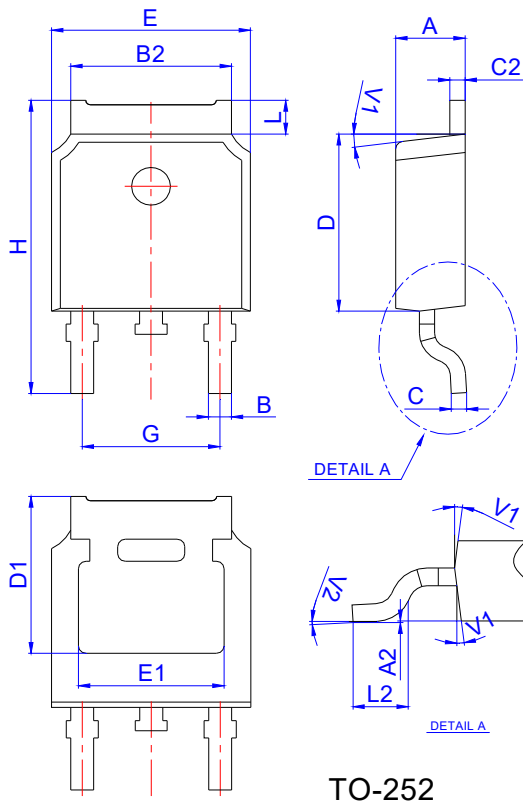


Figure 4. Peak Diode Recovery  $dv/dt$  Test Circuit & Waveforms (For N-channel)

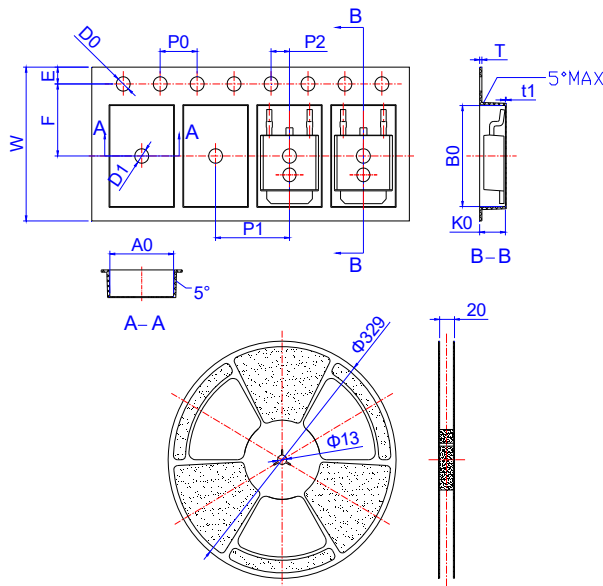


## Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

## Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583


OUTLINE	REEL (PCS)	PER CARTON (PCS)	TAPE & REEL
TAPING	2,500	25,000	13inch



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