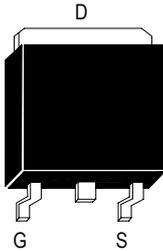


**30V, 180A  
N-CHANNEL POWER MOSFET**
**Features**

$R_{DS(ON)} < 2.5m\Omega @ V_{GS}=10V$   
 $R_{DS(ON)} < 6.0m\Omega @ V_{GS}=4.5V$   
 Advanced Trench Technology  
 Provide Excellent  $R_{DS(ON)}$  and Low Gate Charge  
 Lead free product is acquired

## Product Summary

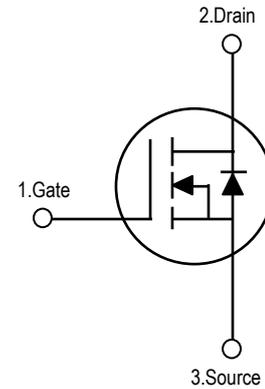
$V_{DS}$	30	V
$R_{DS(ON)}$ Max	2.5	m $\Omega$
$I_D$	180	A



TO-252



Marking


**ORDERING INFORMATION**

Order Number	Package	Pin Assignment			Packing	Reel Size	Reel	Per Carton
		1	2	3			Pcs	Pcs
HPD025N03STA	TO-252	G	D	S	Tape Reel	13 Inch	2500	25000

**Absolute Maximum Ratings** ( $T_C=25^\circ C$  unless otherwise specified)

Symbol	Parameter	Max.	Units
$V_{DSS}$	Drain-Source Voltage	30	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	
$I_D$	Continuous Drain Current	$T_C=25^\circ C$	180
		$T_C=100^\circ C$	98
$I_{DM}$	Pulsed Drain Current <small>note1</small>	600	A
$E_{AS}$	Single Pulsed Avalanche Energy <small>note2</small>	225	mJ
$P_D$	Power Dissipation	$T_C=25^\circ C$	108
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.4	$^\circ C/W$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +175	$^\circ C$

Electrical Characteristics (T<sub>C</sub>=25°C, unless otherwise specified)**Off Characteristic**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	--	--	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	--	--	±100	nA

**On Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.6	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance (note3)	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	--	2.€	GÍ	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	--	1.€	1.0	

**Dynamic Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V V <sub>GS</sub> =0V f=1.0MHz	--	3500	--	pF
C <sub>oss</sub>	Output Capacitance		--	500	--	
C <sub>rss</sub>	Reverse Transfer Capacitance		--	431	--	
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V I <sub>D</sub> =30A V <sub>GS</sub> =10V	--	38	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	9	--	
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		--	13	--	

Electrical Characteristics ( $T_C=25^\circ\text{C}$ , unless otherwise specified)**Switching Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15V$ $I_D=30A$ $R_{GEN}=3\Omega$ $V_{GS}=10V$	--	26	--	nS
$t_r$	Turn-on Rise Time		--	24	--	
$t_{d(off)}$	Turn-off Delay Time		--	91	--	
$t_f$	Turn-off Fall Time		--	39	--	

**Drain-Source Diode Characteristics and Maximum Ratings**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		--	--	150	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		--	--	600	
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A$	--	--	1.2	V
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=20A$ $di/dt=100A/\mu s$	--	42	--	nS
$Q_{rr}$	Body Diode Reverse Recovery Charge		--	39	--	nC

**Notes:**

- 1、Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- 2、EAS condition :  $T_J=25^\circ\text{C}$ ,  $V_{DD}=15V$ ,  $V_G=10V$ ,  $R_G=25\Omega$ ,  $L=0.5mH$ ,  $I_{AS}=30A$
- 3、Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$



Figure 1: Output Characteristics

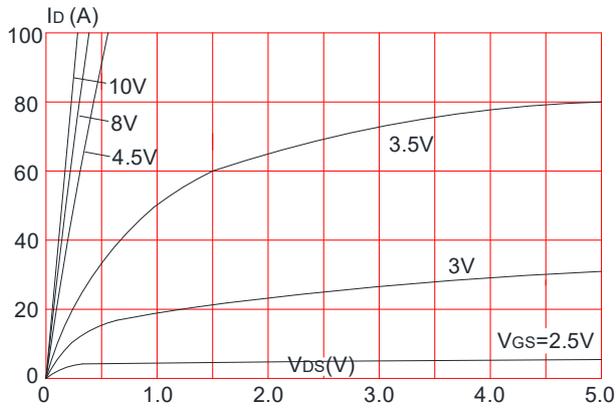


Figure 2: Typical Transfer Characteristics

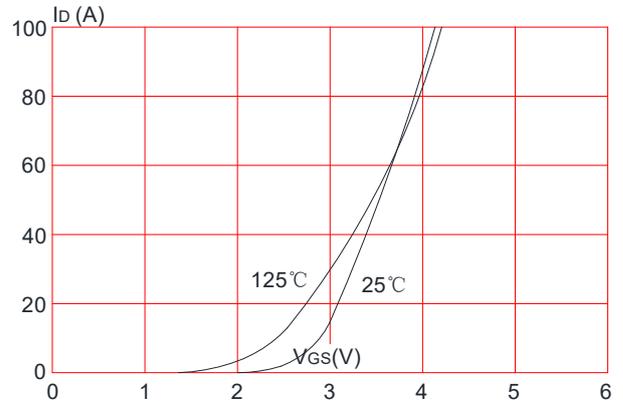


Figure 3: On-resistance vs. Drain Current

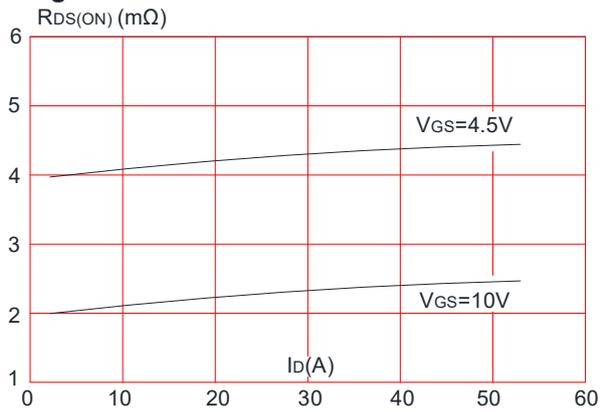


Figure 4: Body Diode Characteristics

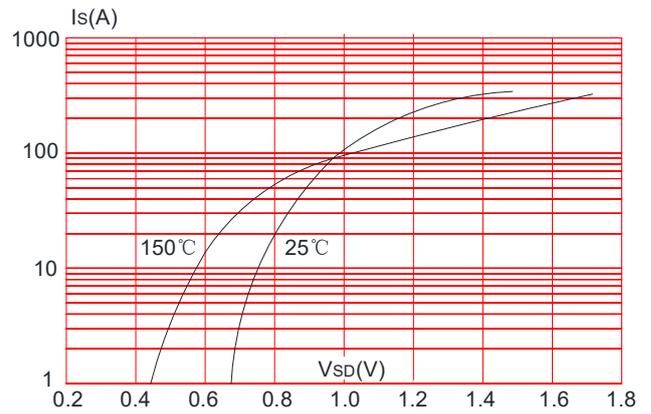


Figure 5: Gate Charge Characteristics

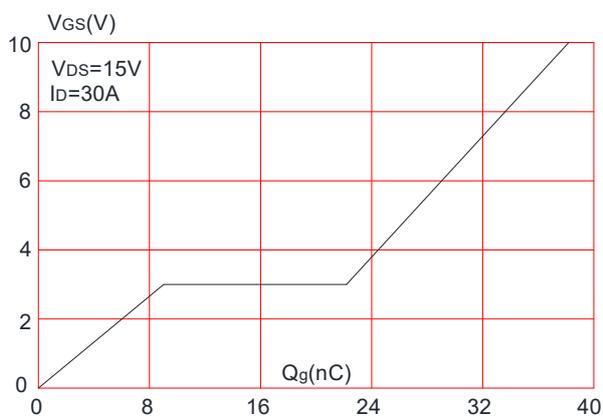


Figure 6: Capacitance Characteristics

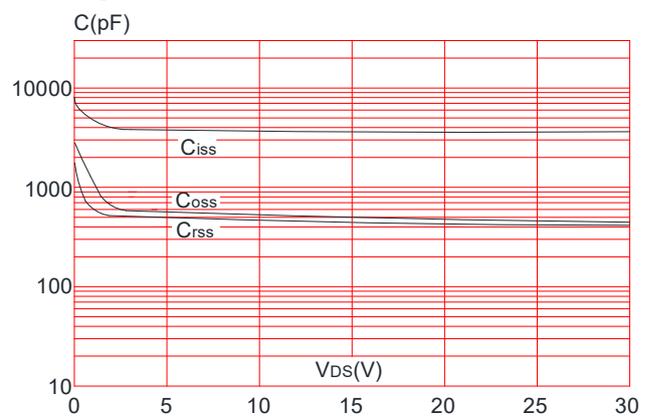


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

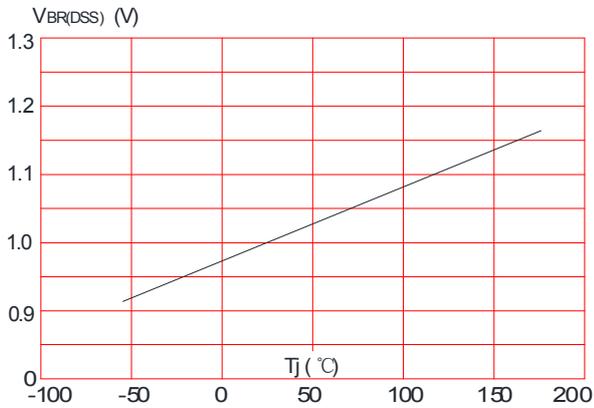


Figure 8: Normalized on Resistance vs. Junction Temperature

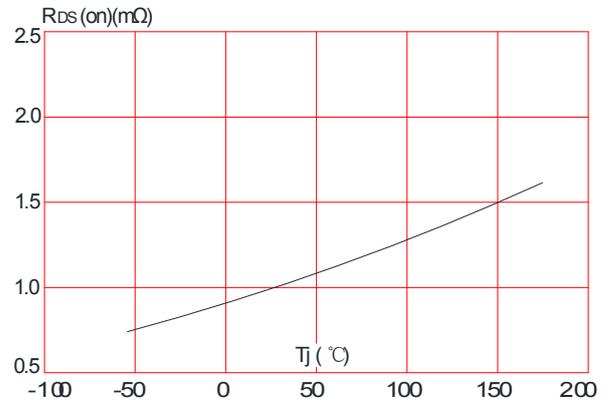


Figure 9: Maximum Safe Operating Area

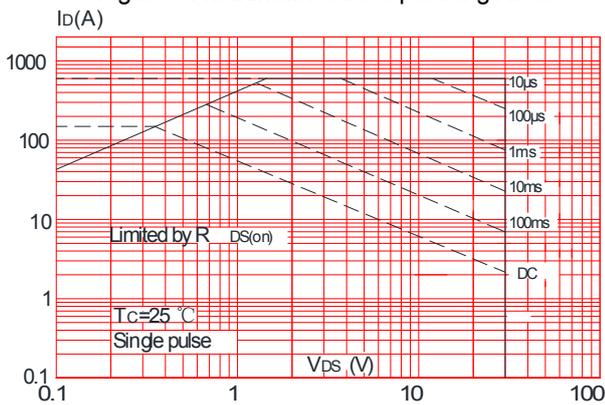


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

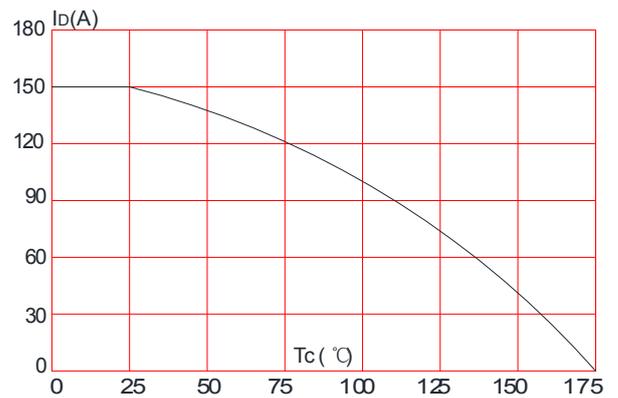
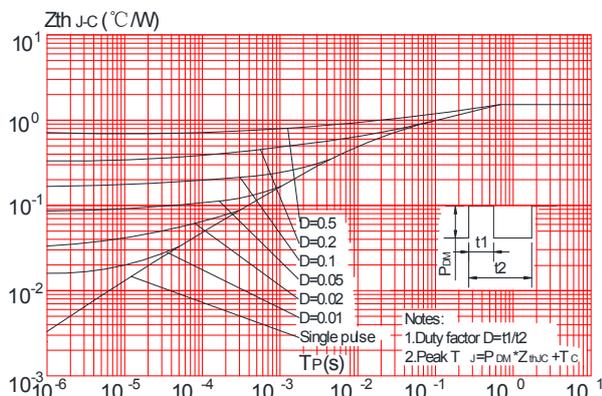


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

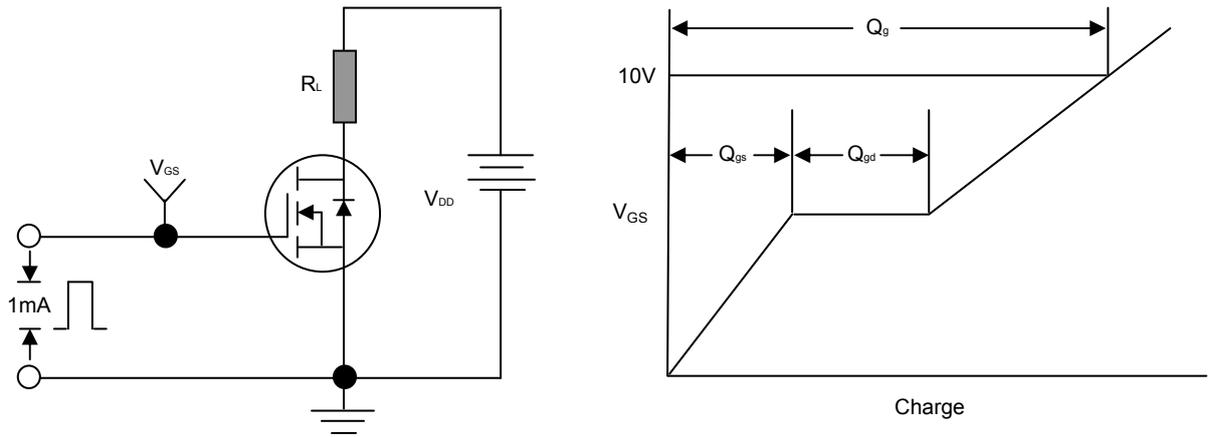


Fig-1: Gate Charge Test Circuit & Waveform

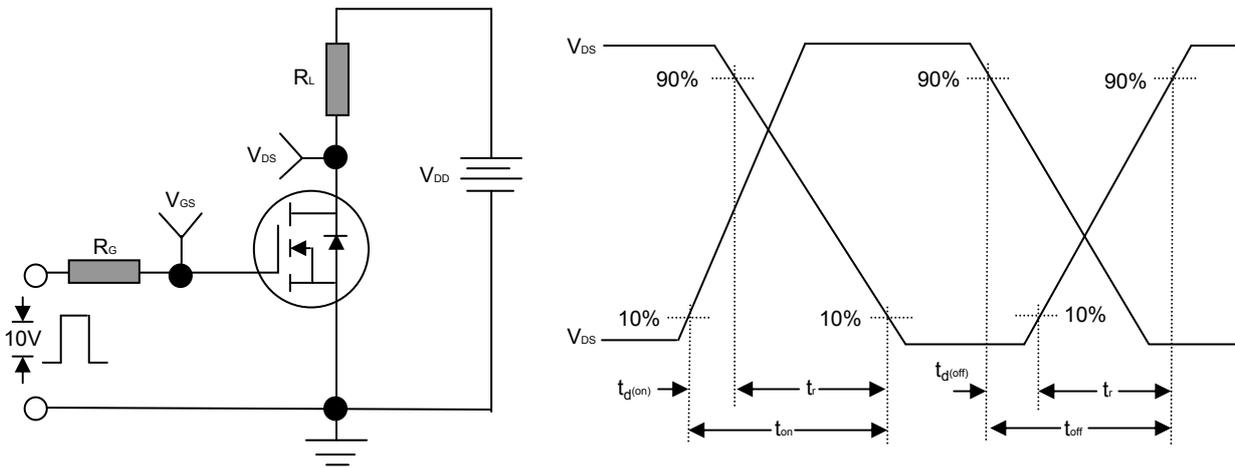


Fig-2: Resistive Switching Test Circuit & Waveforms

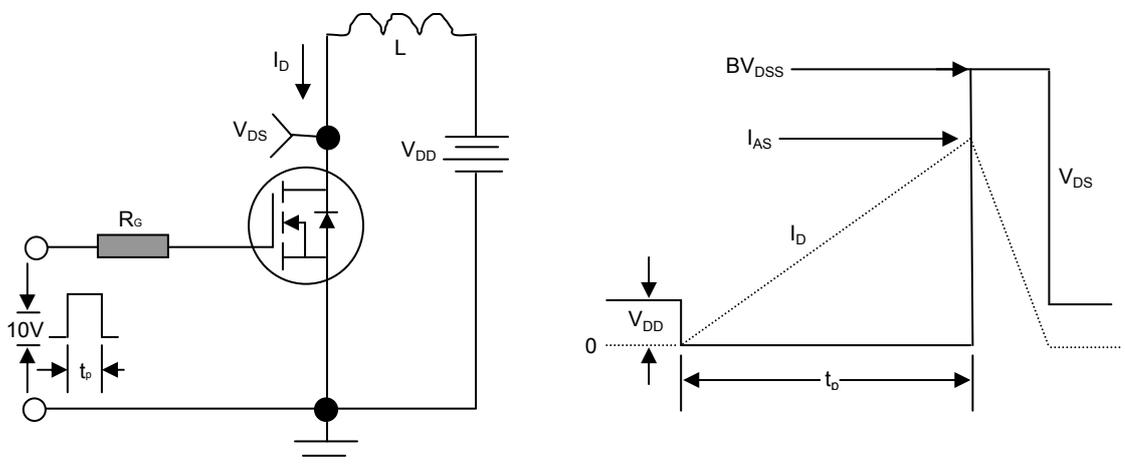
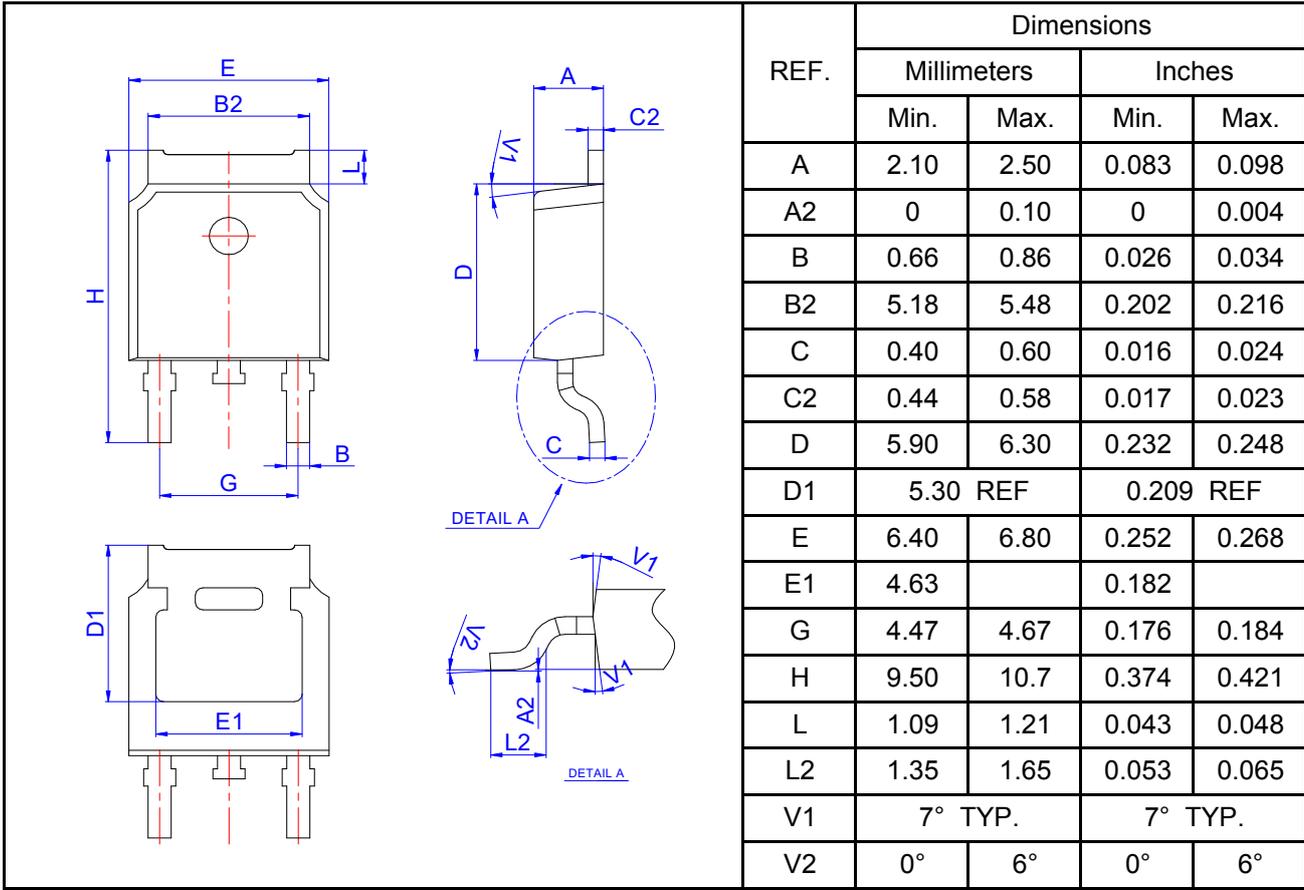


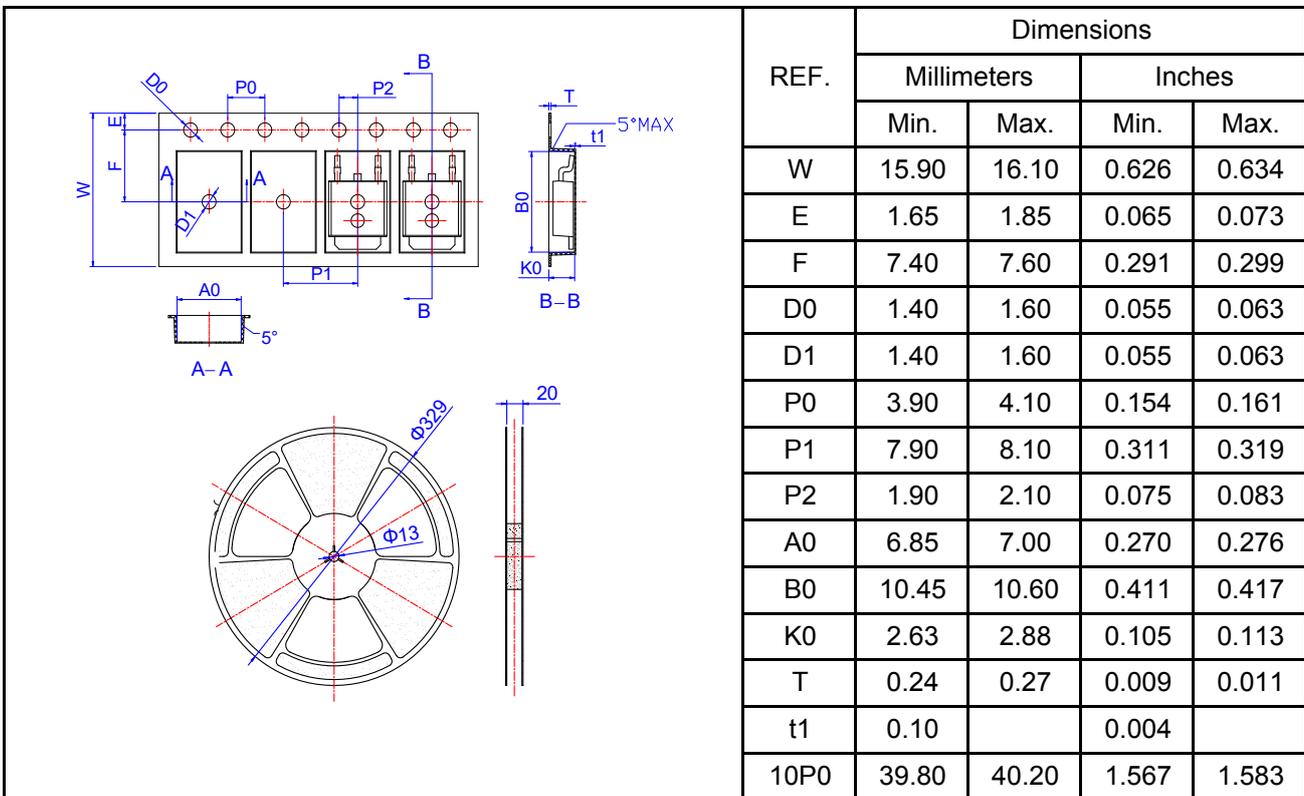
Fig-3: Unclamped Inductive Switching Test Circuit & Waveforms



## TO-252 (DPAK) PACKAGE MECHANICAL DATA (mm & inch)



## TO-252 Reel Specification





Manufacturers version information  
2020-04-18 . HAOHAI™ Product Data-1.0  
2021-08-18 . HAOHAI™ Product Data-1.1



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