15N10

General Description

The 15N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a wide variety of applications.

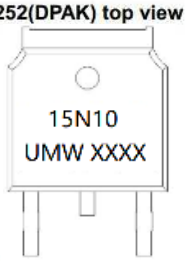
Features

- V_{DS} = 100V,ID =15A
  $R_{DS(ON)}$,95 mΩ (Typ) @ VGS =10V
  $R_{DS(ON)}$, 100mΩ (Typ) @ VGS =4.5V
- Low Total Gate Charge
- Low Reverse Transfer Capacitance
- Improved dv/dt Capability
- Fast Switching Speed

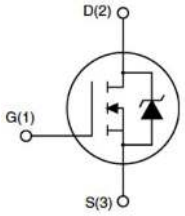
Application

- Uninterruptible Power Supply(UPS)
- Inverter System

TO-252(DPAK) top view



Marking and pin Assignment



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
15N10	15N10	TO-252	325mm	16mm	2500

Absolute Maximum Ratings(T_A=25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous	TC=25℃Note1	I_D	15	A
	TC=100℃		10	A
Drain Current-PulsedNote2		I_{DM}	60	A
Maximum Power Dissipation	TC=25℃	P_D	55	W
Storage Temperature Range		T_{STG}	-55 to +175	℃
Operating Junction Temperature Range		T_J	-55 to +175	℃

Thermal Resistance

Parameter	Symbol	Min.	Typ.	Max	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	-	2.72	-	℃/W

Electrical Characteristics(T_J=25℃ unless otherwise noted)

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_{DS}=250uA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V	-	-	1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA

ON CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	VGS(TH)	V_{DS}=V_{GS},I_{DS}=250uA	1.0	1.6	3.0	V
Drain-Source On-State Resistance	RDS(ON)	V_{GS}=10V,I_{DS}=10A	-	95	110	mΩ
		V_{GS}=4.5V,I_{DS}=5A	-	100	130	
Forward Transconductance	gFS	V_{GS}=5V,I_{DS}=4A	2	-	-	S

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C_{iss}	VDS =50V, VGS = 0V, f=1MHz	-	632	-	pF
Output Capacitance	C_{oss}		-	37	-	
Reverse Transfer Capacitance	C_{rss}		-	21	-	

SWITCHING CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	$T_{d(on)}$	V_{GS}=10V,V_{Ds}=50V, R_L=2.8Ω, R_{GEN}=6Ω, ID=10A	-	12.6	-	ns
Rise Time	t_r		-	6	-	
Turn-Off Delay Time	$T_{d(off)}$		-	32.5	-	
Fall Time	t_f		-	4.3	-	
Total Gate Charge at 10V	Q_g	V_{DS}=80V,I_{DS}=10A, V_{GS}=10V	-	19.2	-	nC
Gate to Source Gate Charge	Q_{gs}		-	3.4	-	
Gate to Drain“Miller”Charge	Q_{gd}		-	6.1	-	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{DS}=10A	-	-	1.2	V

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: T_J=25℃,VDD=50V,V_G=10V, RG=25Ω

Typical Performance Characteristics

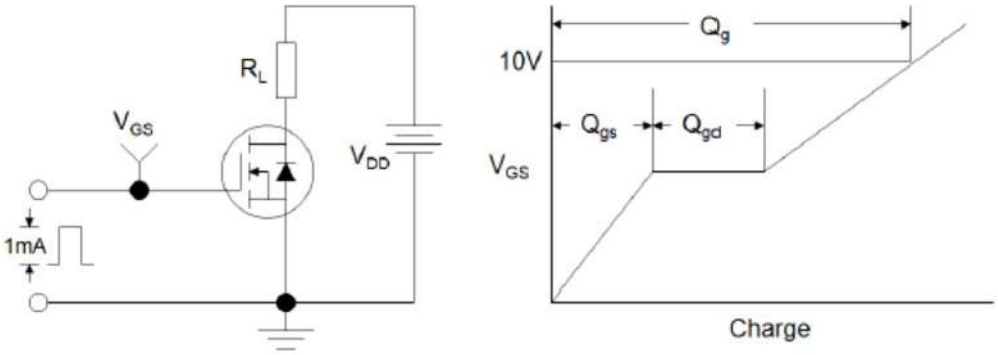


Figure1:Gate Charge Test Circuit & Waveform

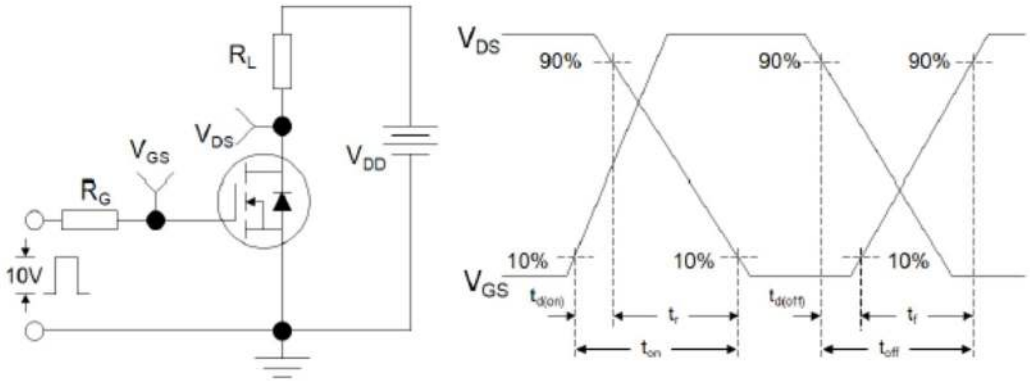


Figure 2: Resistive Switching Test Circuit & Waveforms

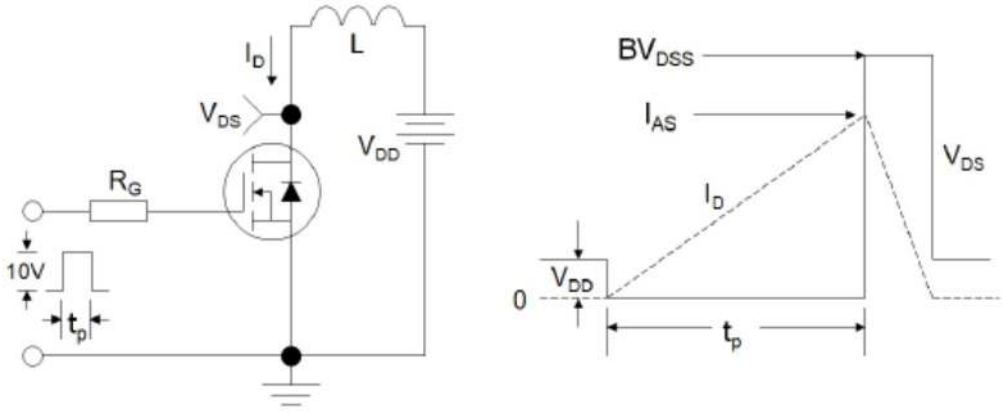


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

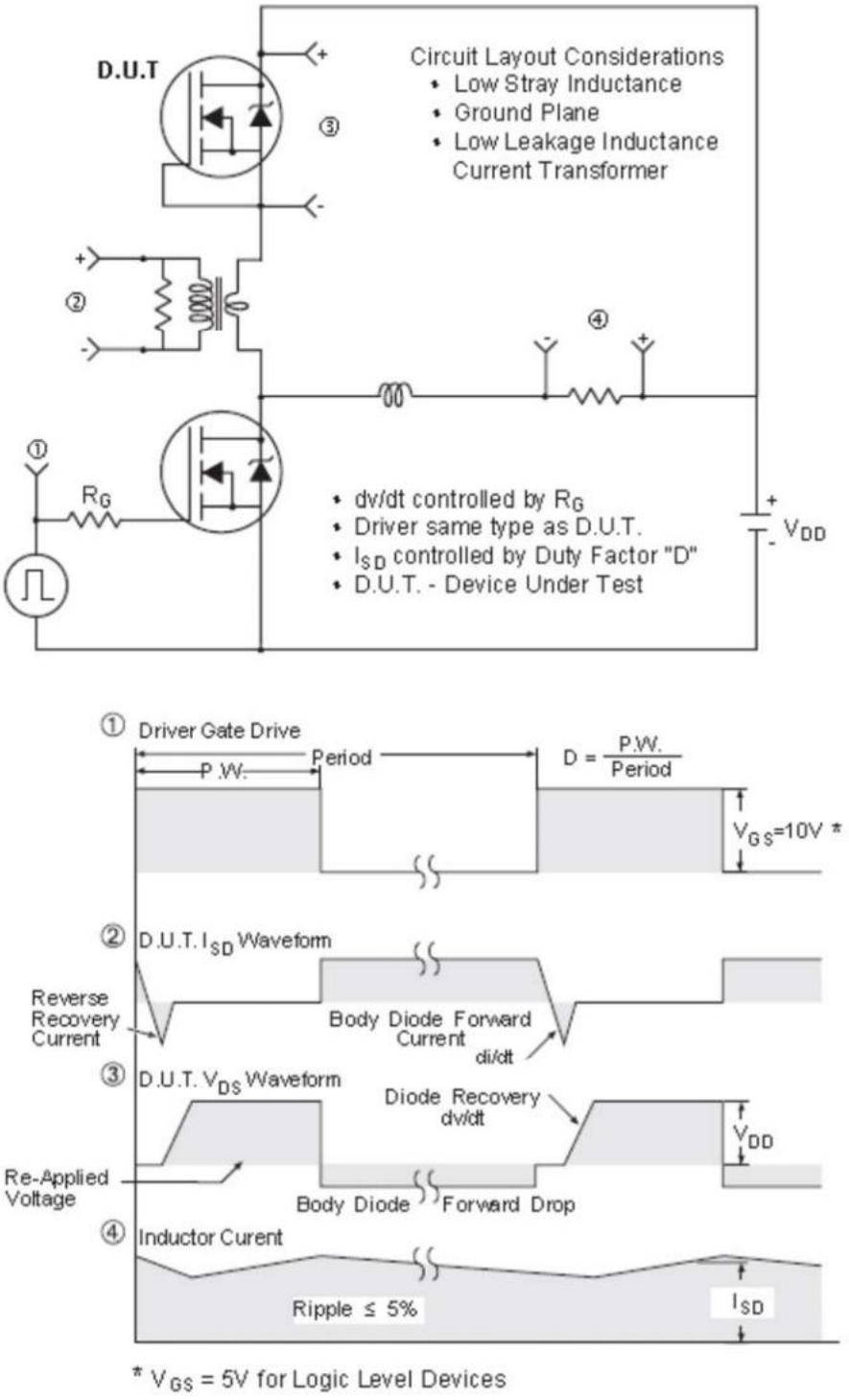
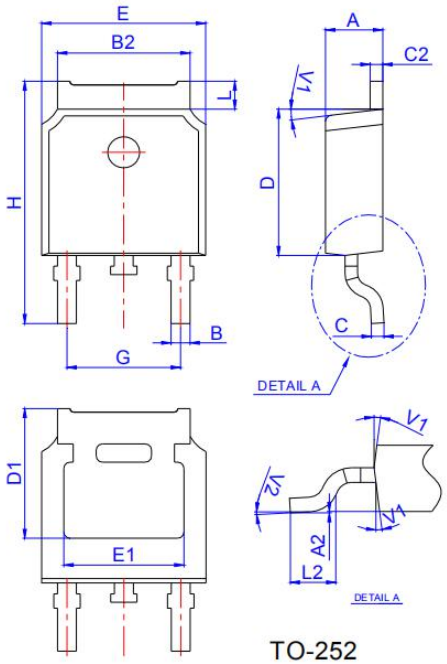


Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

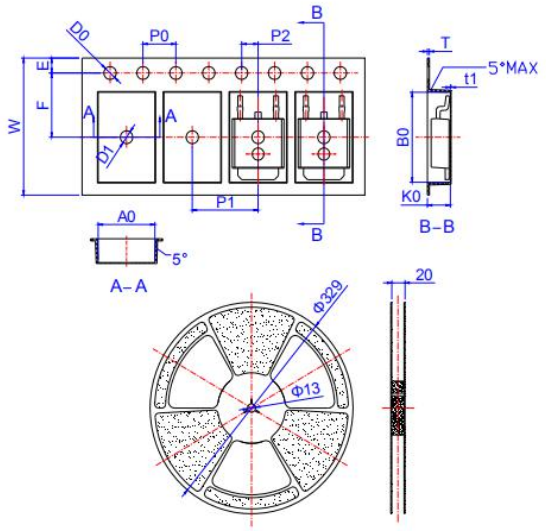
Package Mechanical Data



TO-252

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 Spectification-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

		SCALE	
		4:1	mm 0 30 THIRD ANGLE PROJECTION
		SHEET	
DWG NO: TO-252-01-A1	TITLE TO-252	1 OF 1	