

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology
- ★ 100% EAS Guaranteed

Product Summary

RoHS

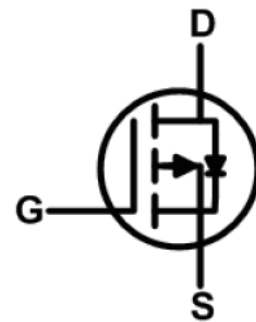
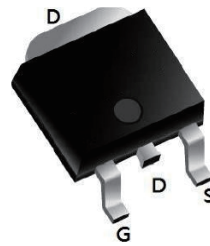
BVDSS	RDSON	ID
-100V	59mΩ	-25A

Description

The 25P10 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The 25P10 meet the RoHS and Green Product, requirement 100% EAS guaranteed with full function reliability approved.

TO252 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Max.	Unit	
V_{DSS}	Drain-Source Voltage	-100	V	
V_{GSS}	Gate-Source Voltage	±20	V	
I_D	Continuous Drain Current	$T_c = 25^\circ C$	-25	A
		$T_c = 100^\circ C$	-11	A
I_{DM}	Pulsed Drain Current <small>note1</small>	-72	A	
EAS	Single Pulsed Avalanche Energy <small>note2</small>	42	mJ	
P_D	Power Dissipation	$T_c = 25^\circ C$	102	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.22	$^\circ C/W$	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient 1	91	$^\circ C/W$	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 150	$^\circ C$	

Electrical Characteristics (T_J = 25 °C unless otherwise specified)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Units
Static Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-100	-	-	V
I _{GSS}	Gate-body Leakage current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -100V, V _{GS} = 0V	-	-	-1	μA
I _{DSS}			T _J = 100°C	-	-	
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1.5	-2	-2.5	V
R _{DS(on)}	Drain-Source On-Resistance ⁴	V _{GS} = -10V, I _D = -10A	-	59	70	mΩ
		V _{GS} = -4.5V, I _D = -6A	-	120	150	
g _{fs}	Forward Transconductance ⁴	V _{DS} = -10V, I _D = -10A	-	28	-	S
Dynamic Characteristics⁵						
C _{iss}	Input Capacitance	V _{DS} = -50V, V _{GS} = 0V, f = 1MHz	-	2859	-	pF
C _{oss}	Output Capacitance		-	93	-	
C _{rss}	Reverse Transfer Capacitance		-	68	-	
R _g	Gate Resistance	f = 1MHz	-	4.3	-	Ω
Switching Characteristics⁵						
Q _g	Total Gate Charge	V _{GS} = -10V, V _{DS} = -50V, I _D = -10A	-	53	-	nC
Q _{gs}	Gate-Source Charge		-	12	-	
Q _{gd}	Gate-Drain Charge		-	10	-	
t _{d(on)}	Turn-On Delay Time	V _{GS} = -10V, V _{DD} = -50V, R _G = 3Ω, I _D = -10A	-	8	-	ns
t _r	Rise Time		-	27	-	
t _{d(off)}	Turn-Off Delay Time		-	155	-	
t _f	Fall Time		-	77	-	
t _{rr}	Body Diode Reverse Recovery Time	I _F = -10A, dI/dt = 100A/μs	-	36	-	nC
Q _{rr}	Body Diode Reverse Recovery Charge		-	40	-	
Drain-Source Body Diode Characteristics						
V _{SD}	Diode Forward Voltage ⁴	I _S = -10A, V _{GS} = 0V	-	-0.9	-1.3	V
I _S	Continuous Source Current	-	-	-	25	A

Note :

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)} = 150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD} = -35V, V_{GS} = -10V, L = 0.5mH, I_{AS} = -23A
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test..

P-Channel Typical Characteristics

Figure 1: Output Characteristics

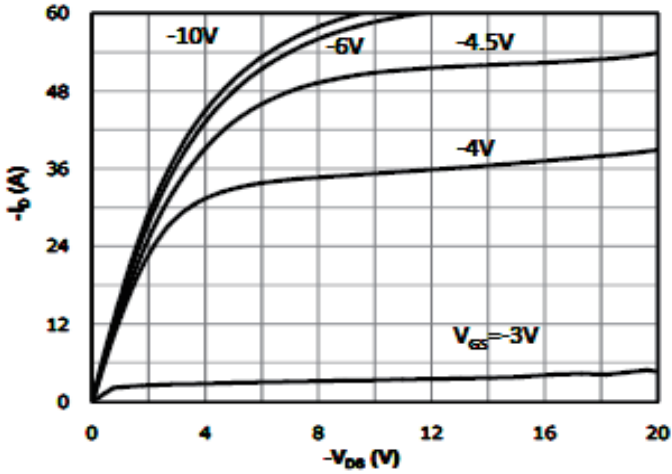


Figure 2: Transfer Characteristics

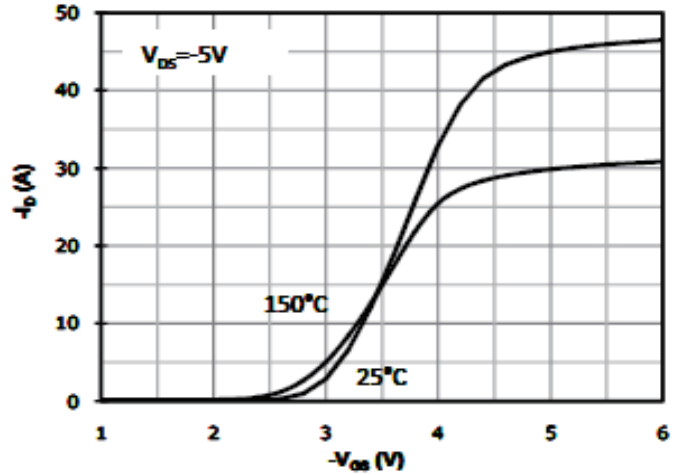


Figure 3: Rds(on) vs Drain Current

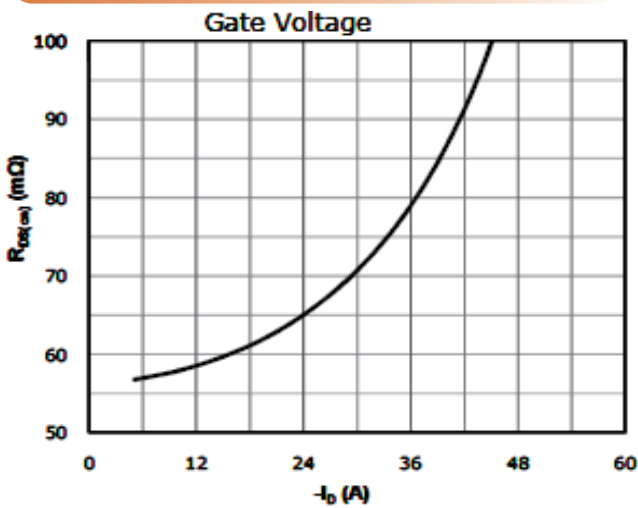


Figure 4: Rds(on) vs Gate Voltage

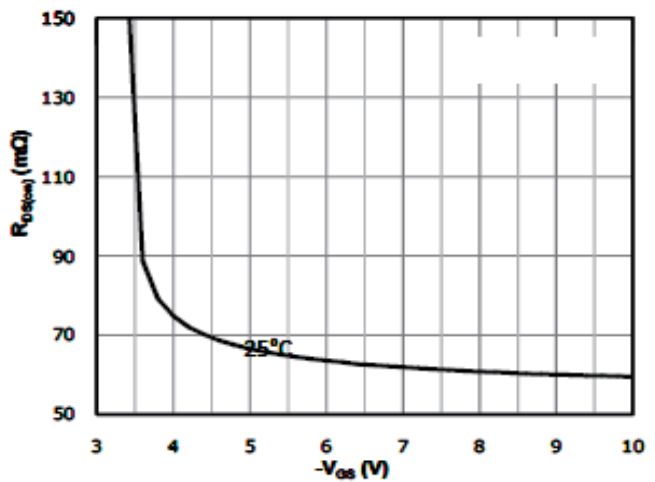


Figure 5: Rds(on) vs. Temperature

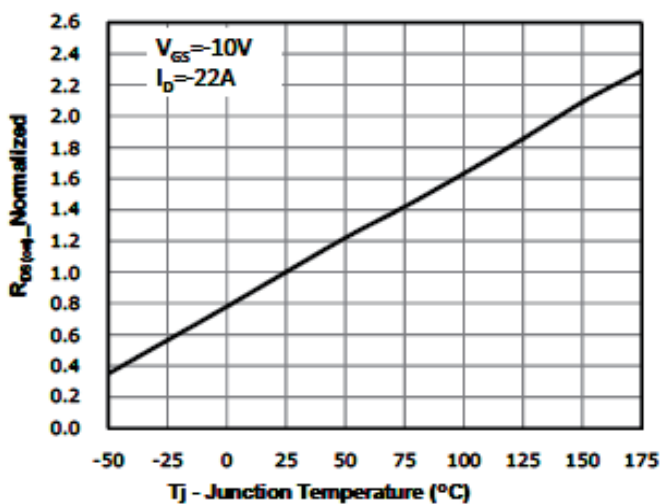
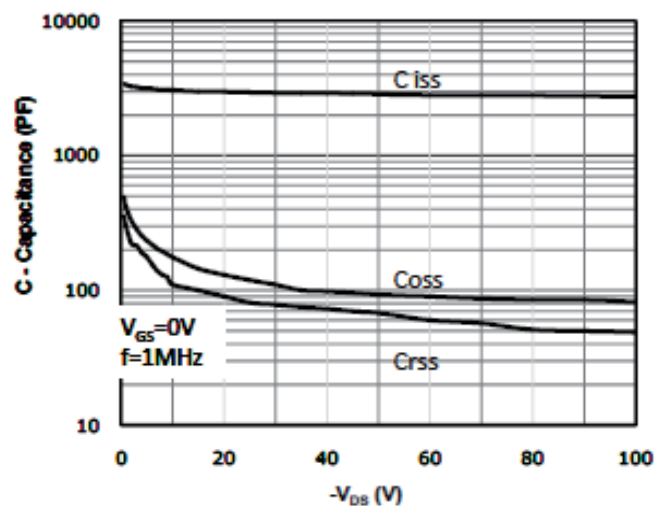
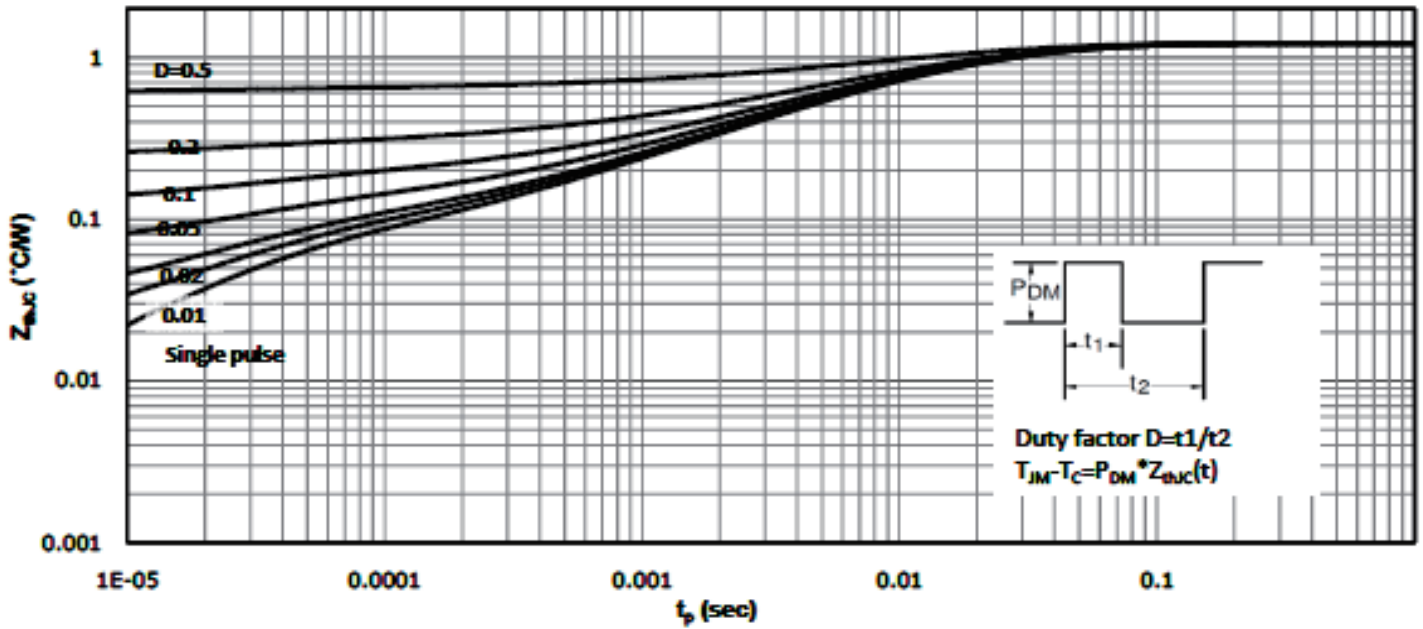


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 12: Max. Transient Thermal Impedance



Test Circuit & Waveform

Figure 7: Capacitance Characteristics

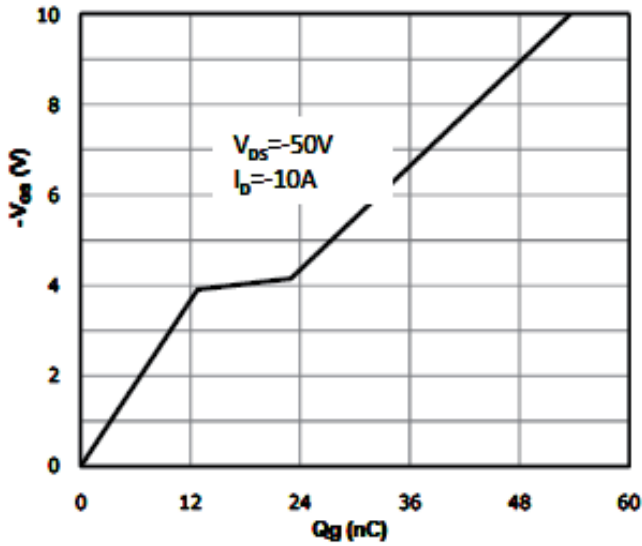


Figure 8: Gate Charge Characteristics

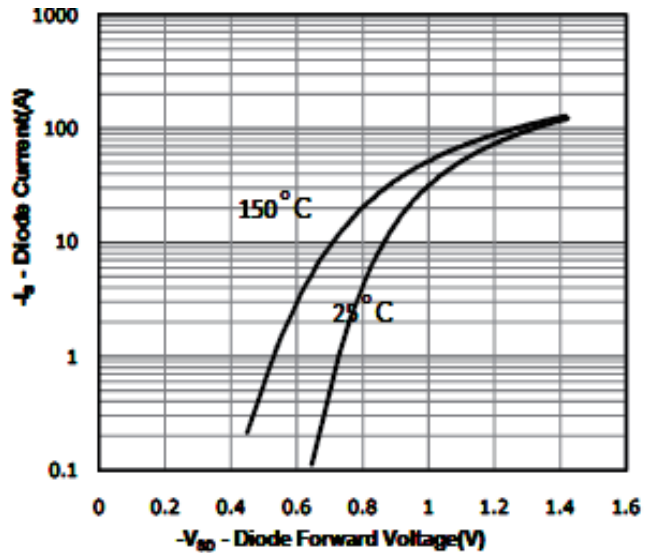


Figure 9: Power Dissipation

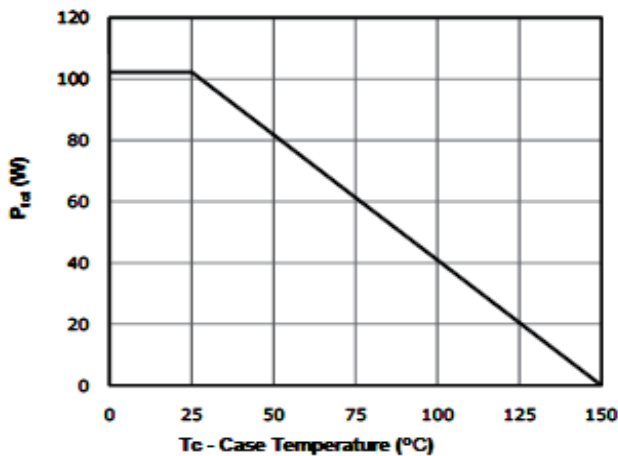


Figure 10: Safe Operating Area

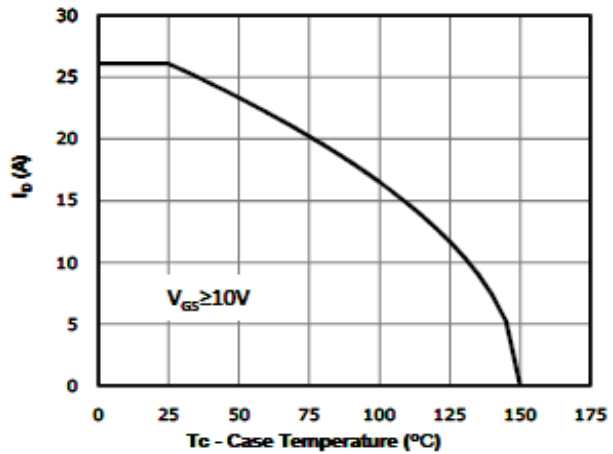
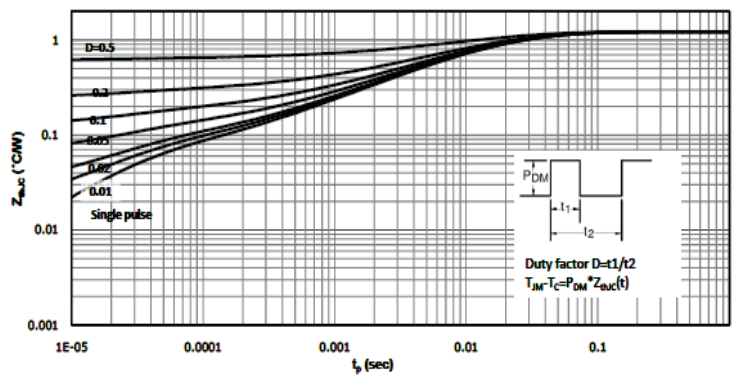
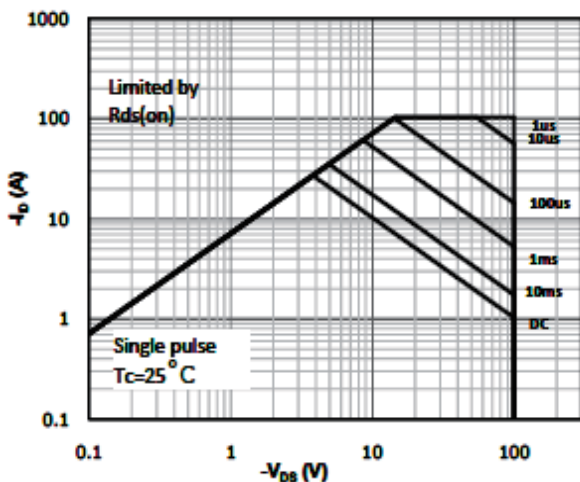
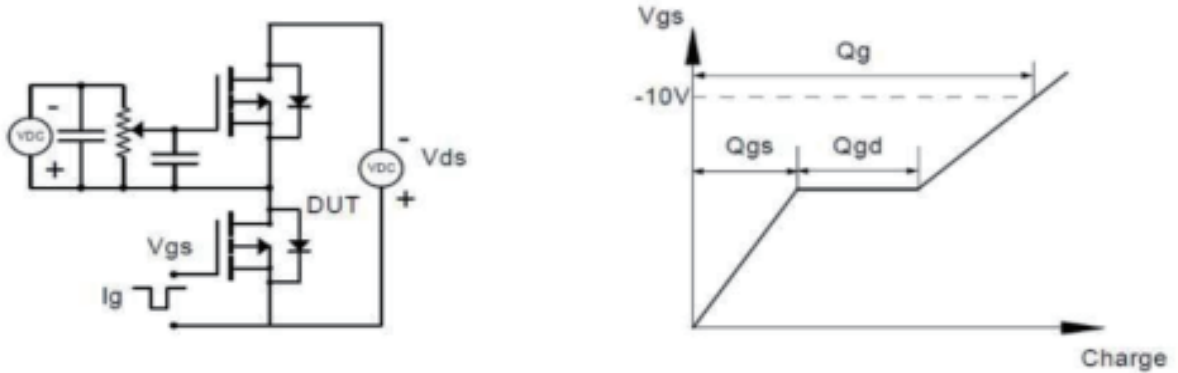


Figure 11: Normalized Maximum Transient

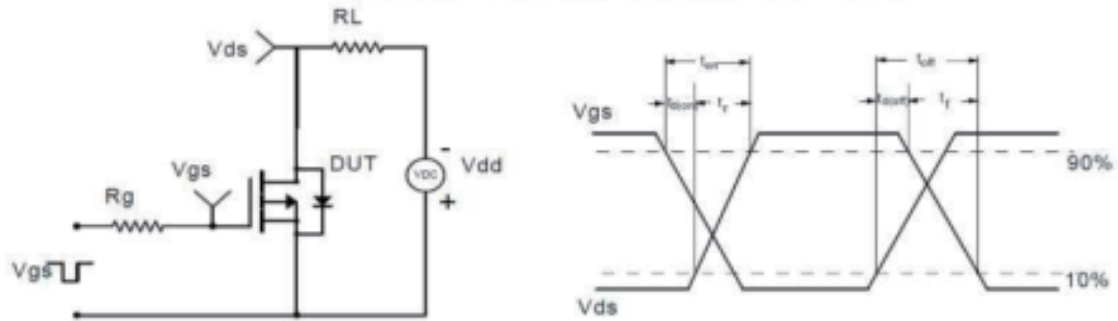


Test Circuit & Waveform

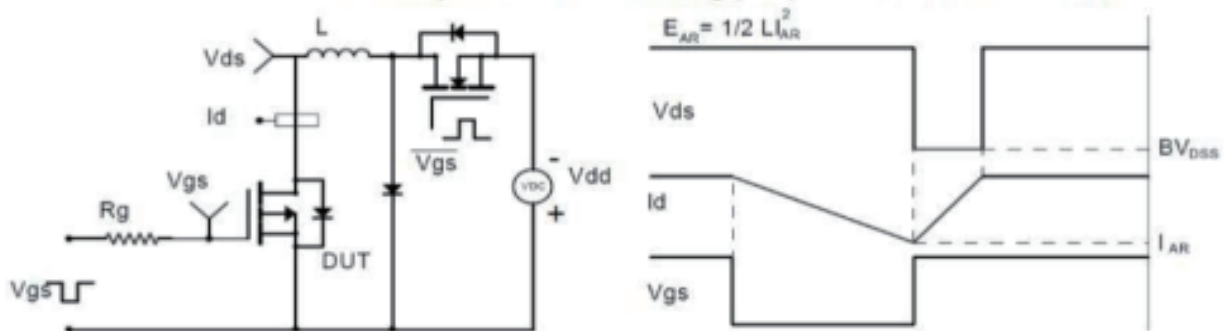
Gate Charge Test Circuit & Waveform



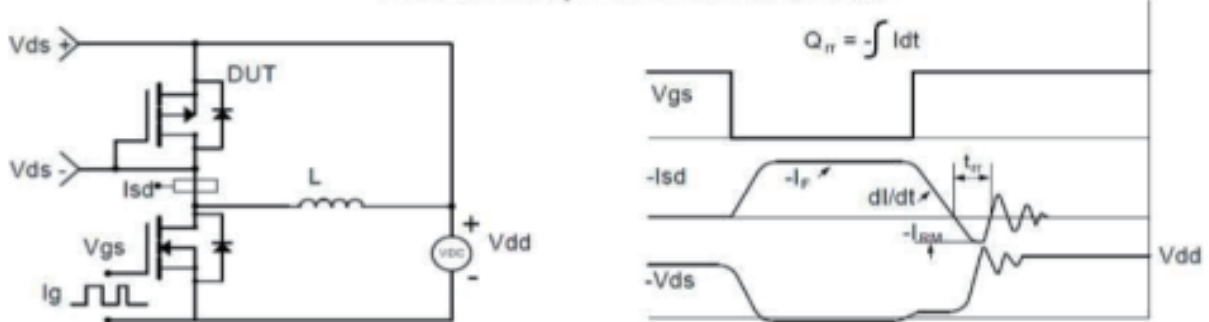
Resistive Switching Test Circuit & Waveforms



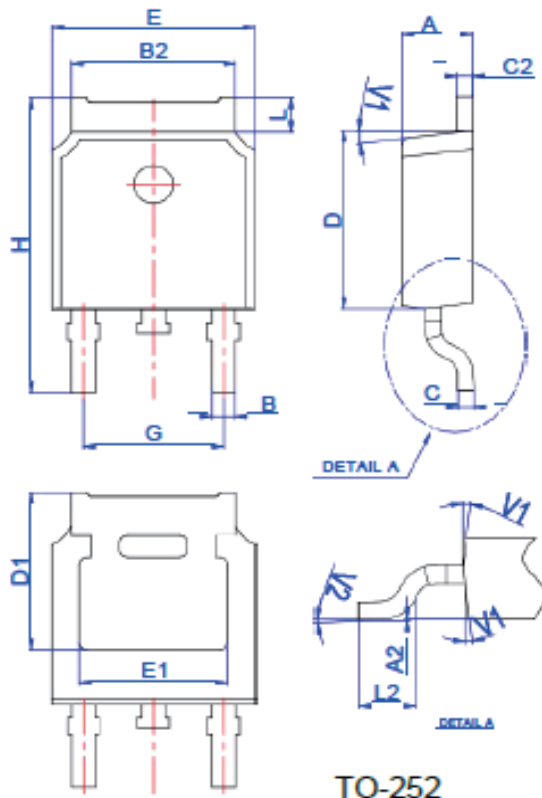
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

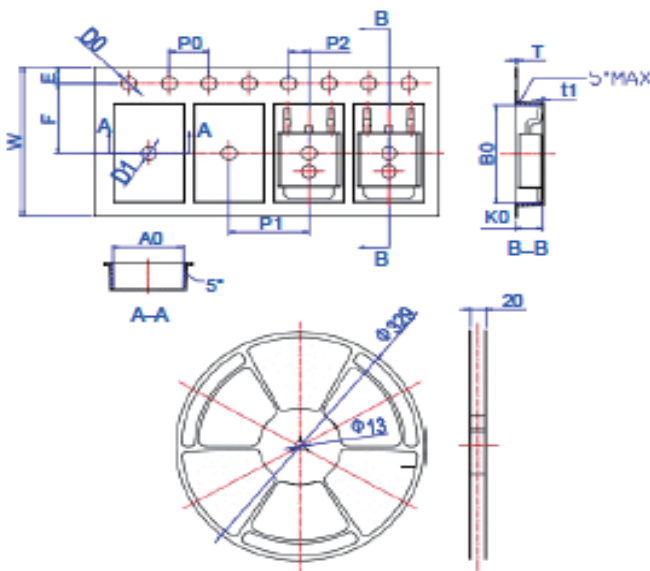


Package Mechanical Data-TO-252



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 Specification-TO-252-4R



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