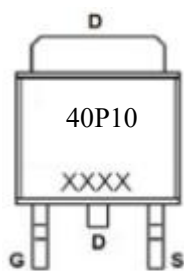
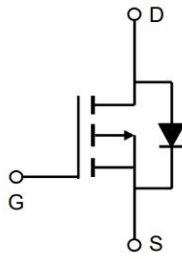


Features ➤ Super Low Gate Charge ➤ Green Device Available ➤ Excellent Cdv/dt effect decline ➤ Advanced high cell density Trench technology ➤ 100% EAS Guaranteed	Bvdss	Rdson	ID
	-100V	31mΩ	-40A
	Application ➤ PWM applications ➤ Load Switch ➤ Power management		



Package
  

Marking and pin assignment

TO-252top view

Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
	40P10	TO-252	2500

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-100	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current T _C = 25°C (Silicon limit)=25°C (Package limit) T _C =100°C (Silicon limit)	I _D	-40 -66 -21	A
Pulsed Drain Current (T _C = 25°C, t _p limited by T _{jmax})	I _{D pulse}	-135	A
Avalanche energy, single pulse (L=0.5mH, R _g =25Ω)	E _{AS}	95	mJ
Power Dissipation T _C = 25°C	P _{tot}	94	W
Operating junction and storage temperature	T _j , T _{stg}	-55+150	°C
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	T _{sold}	260	°C



Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Case	R_{thJC}	1.33	$^{\circ}C/W$
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}^*	129	$^{\circ}C/W$

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
40P10	TO-252	1	2	3	Tape Reel

Electrical Characteristics ($T_J=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Static Characteristic						
Drain-Source Breakdown Voltage	BV _{DSS}	-100	-	-	V	V _{GS} =0V , I _D =-250uA
Gate threshold voltage	V _{GS(th)}	-1.5	-2.0	-2.5	V	V _{DS} =V _{GS} ,I _D =-250uA
Zero gate voltage drain current	I _{DSS}	--	--	-1	uA	V _{DS} =-100V , V _{GS} =0V , T _J =25℃
		--	--	-50		V _{DS} =-100V , V _{GS} =0V , T _J =150℃
Gate-source leakage current	I _{GSS}	--	--	± 100	nA	V _{GS} =± 20,V _{DS} =0V
Drain-source on-state resistance	R _{DS(on)}	--	31	37	m Ω	V _{GS} =-10V, I _D =-22A
		--	66	83		T _J =25℃ ,T _J =150℃
		--	37	48		V _{GS} =-4.5V, I _D =-10A
Transconductance	g _{fs}	--	58	--	S	V _{DS} =-5V , I _D =-22A
Dynamic Characteristic						
Input Capacitance	C _{iss}	--	5805	--	pF	V _{DS} =-50V , V _{GS} =0V ,f=1MHz
Output Capacitance	C _{oss}	--	178	--		
Reverse Transfer Capacitance	C _{rss}	--	86	--		
Gate Total Charge	Q _g	--	100	--	nC	V _{DS} =-50V , V _{GS} =-10V , I _d =-22A,f=1MHz
Gate-Source charge	Q _{gs}	--	25	--		
Gate-Drain charge	Q _{gd}	--	16	--		
Turn-on delay time	T _{d(on)}	--	15	--	ns	V _{GS} =-10V, V _{DD} =-50V,
Rise time	T _r	--	44	--		



Turn-off delay time	$T_{d(off)}$	--	90	--		$R_{G_ext}=2.7\Omega$, $I_D=-22A$
Fall Time	T_f	--	76	--		
Gate resistance	R_g	--	3.8	--	Ω	$V_{GS}=0V, V_{DS}=0V, f=1MHz$
Body Diode Characteristic						
Body Diode Forward Voltage	V_{sd}	--	-0.87	-1.3	V	$V_{GS}=0V, I_{SD}=-22A$
Body Diode Forward Current	I_s	--	--	-40	A	$T_C = 25^\circ C$
Body Diode Reverse Recovery Time	T_{rr}	--	33	--	Ns	$I_{SD}=-22A$, $dI/dt=100A/\mu s$
Body Diode Reverse Recovery Charge	Q_{rr}	--	54	--	nC	

Notes: *The value of R_{thJA} is measured by placing the device in a still air box which is one cubic foot.

Typical Performance Characteristics

Fig 1: Output Characteristics

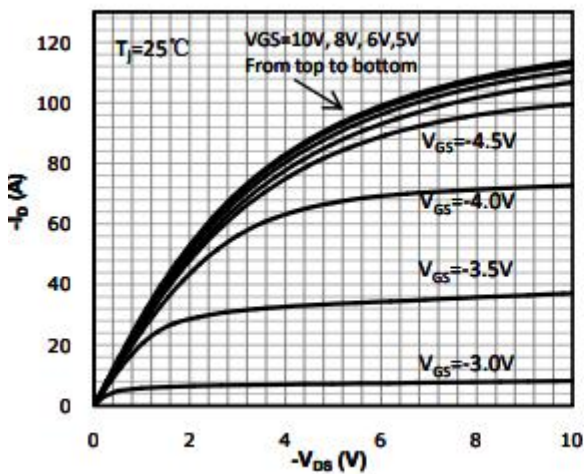


Fig 2: Transfer Characteristics

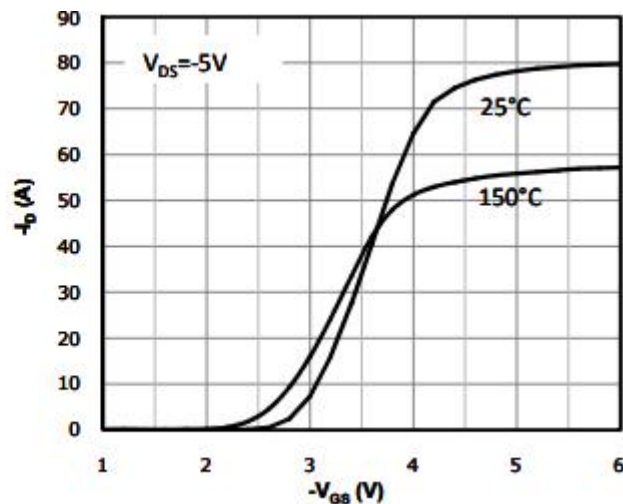


Fig 3: $R_{ds(on)}$ vs Drain Current and Gate Voltage

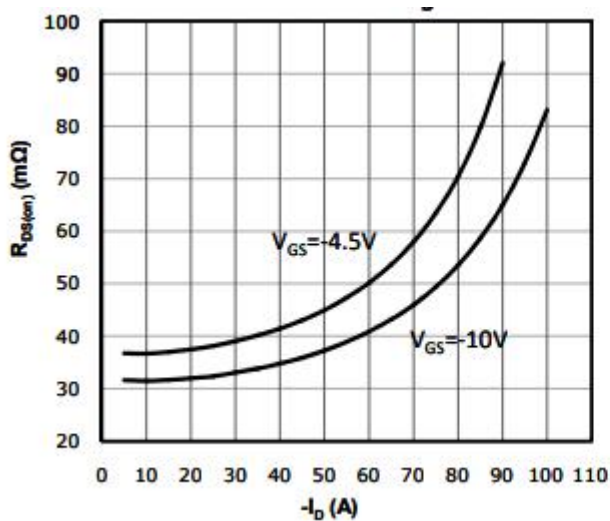


Fig 4: $R_{ds(on)}$ vs Gate Voltage

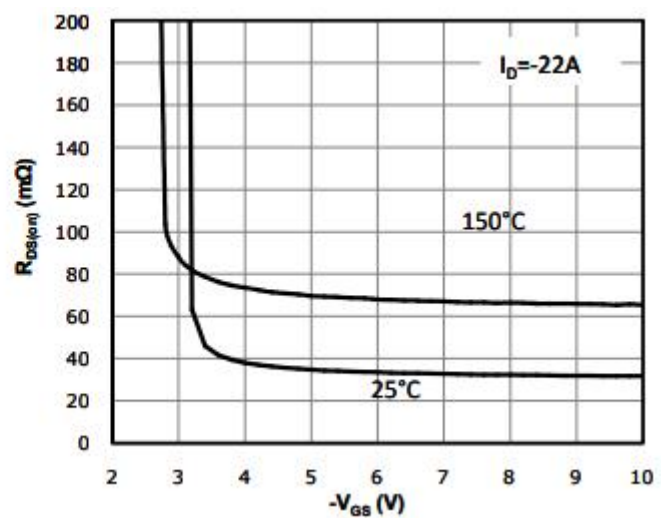


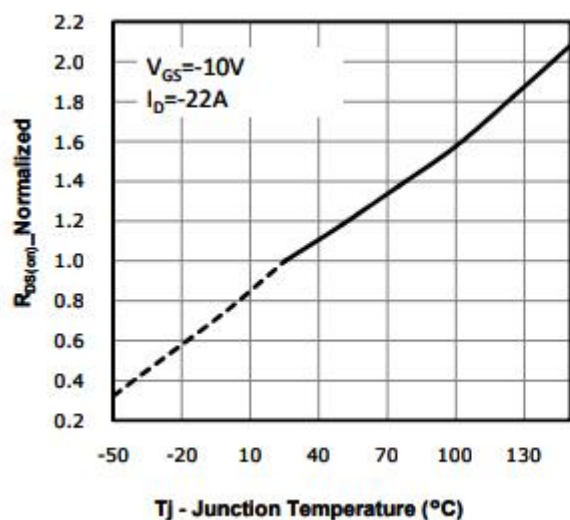
Fig 5: $R_{ds(on)}$ vs. Temperature


Fig 6: Capacitance Characteristics

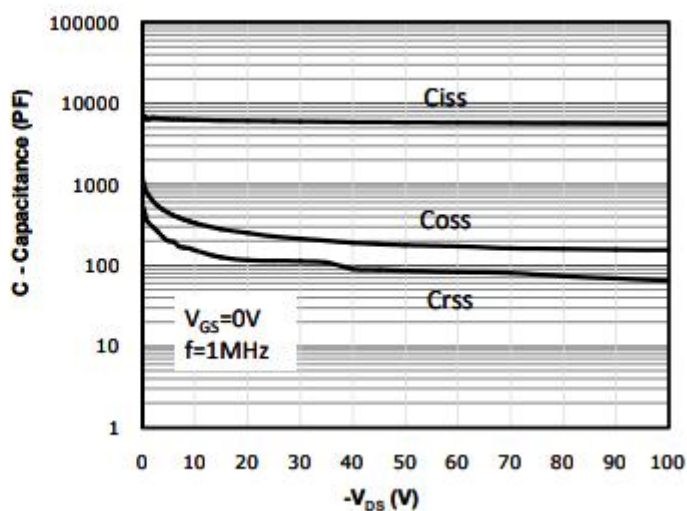
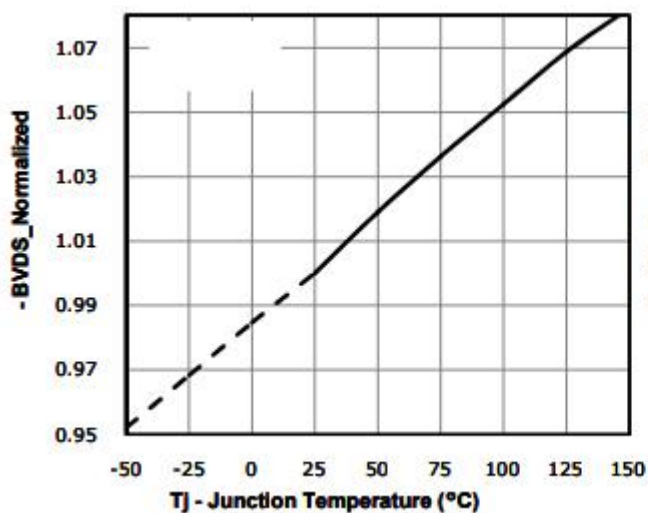
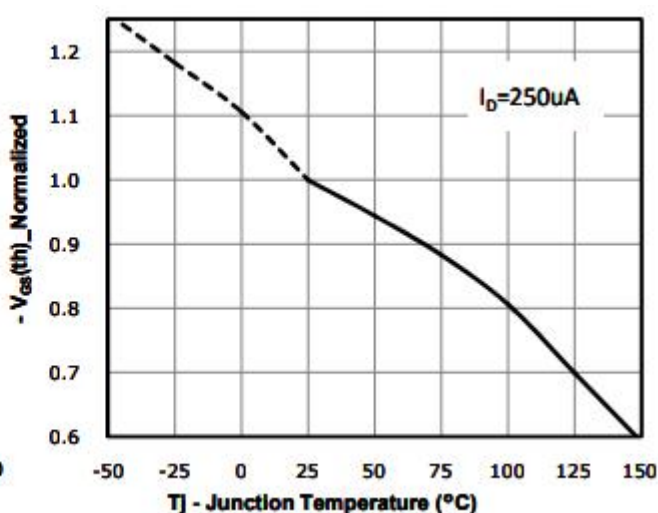

Fig 7: BV_{DS} vs. Temperature

Fig 8: $V_{GS(th)}$ vs. Temperature


Fig 9: Gate Charge Characteristics

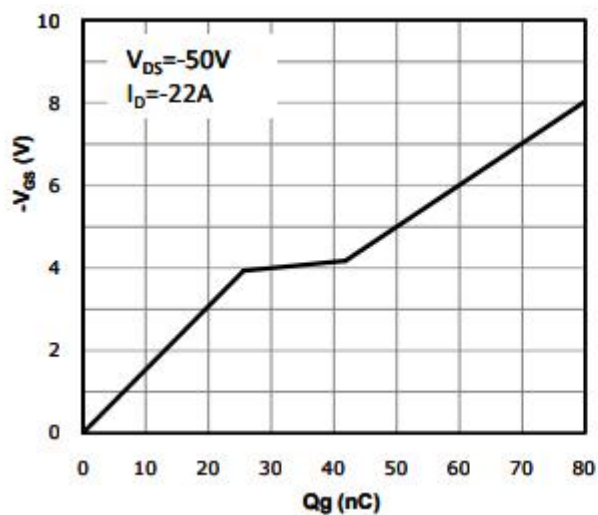


Fig 10: Body-diode Forward Characteristics

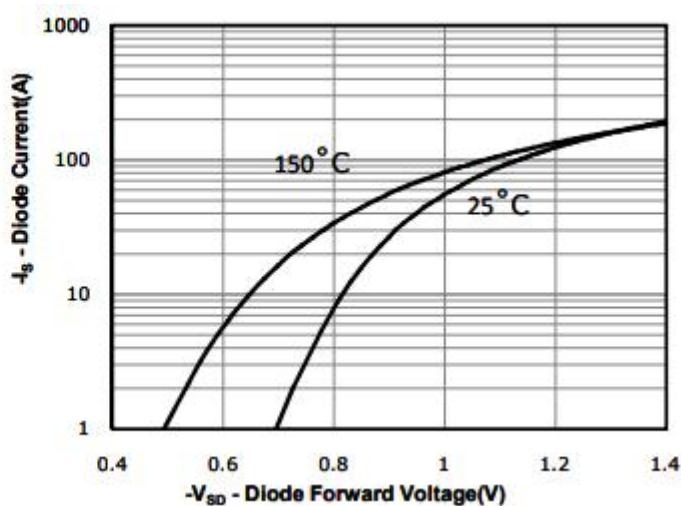


Fig 11: Power Dissipation

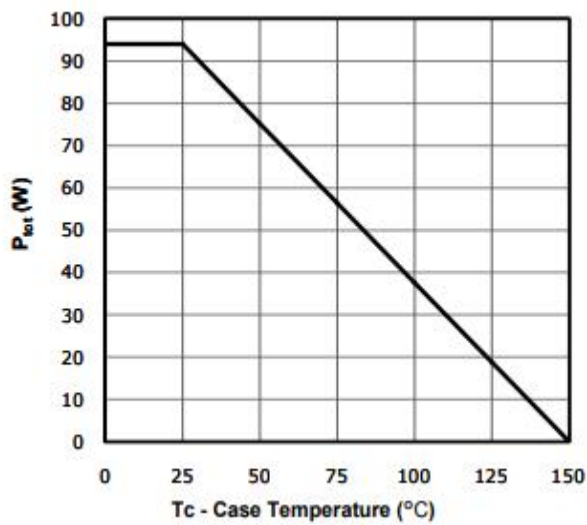


Fig 12: Drain Current Derating

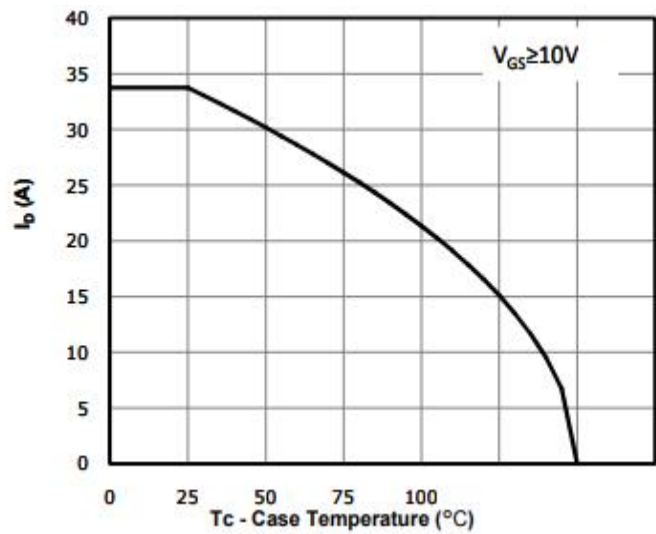


Fig 13: Safe Operating Area

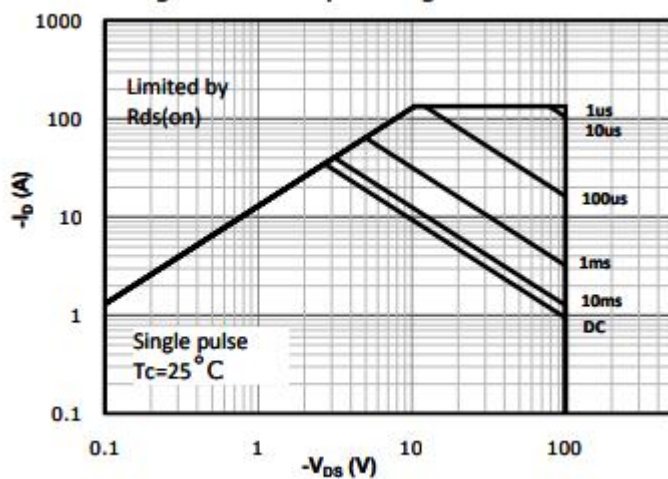
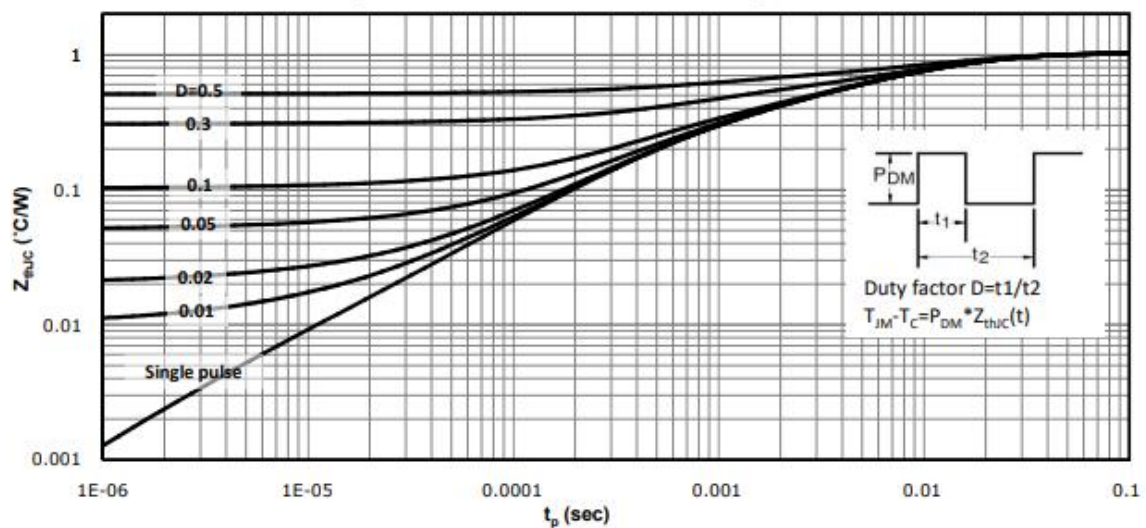
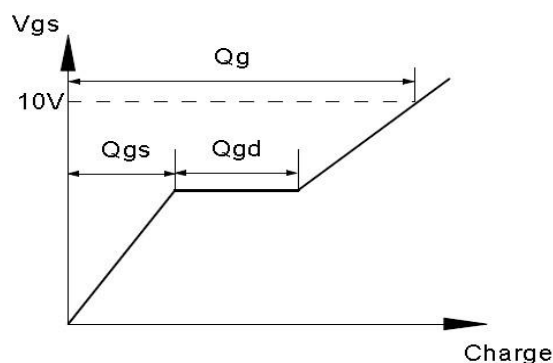
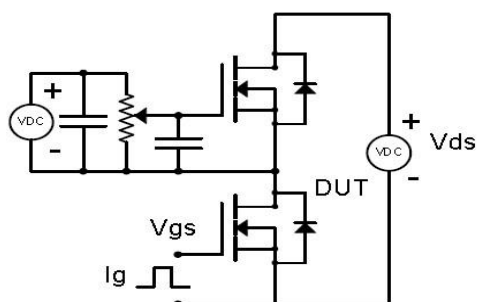


Fig 14: Max. Transient Thermal Impedance

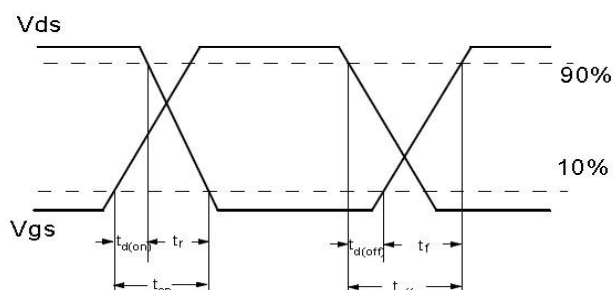
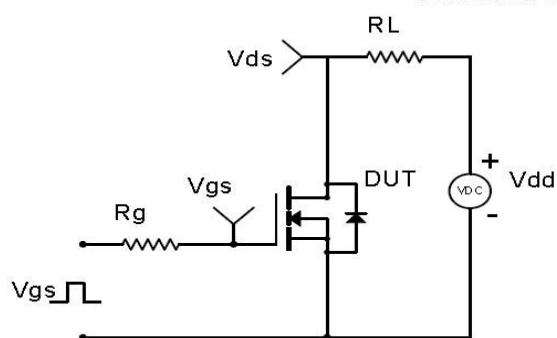


Test Circuit & Waveform

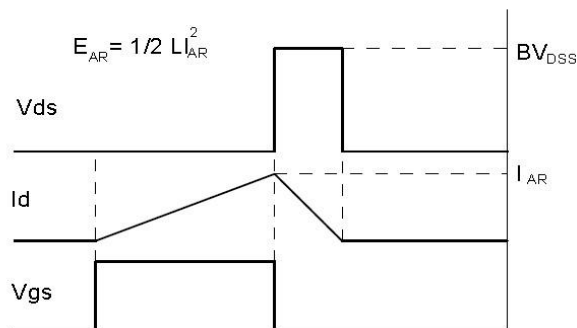
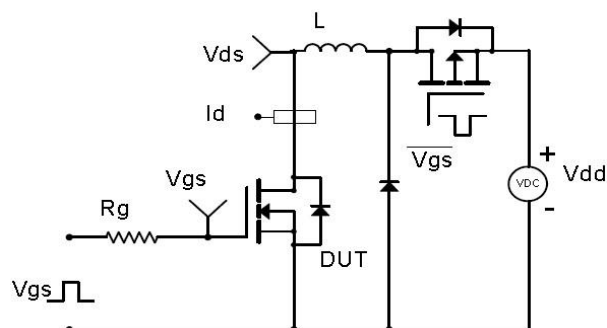
Gate Charge Test Circuit & Waveform



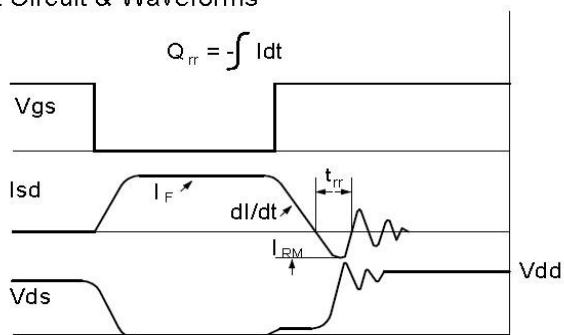
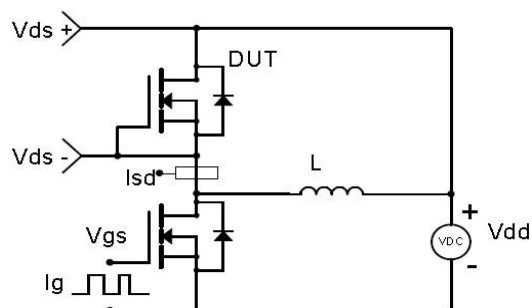
Resistive Switching Test Circuit & Waveforms



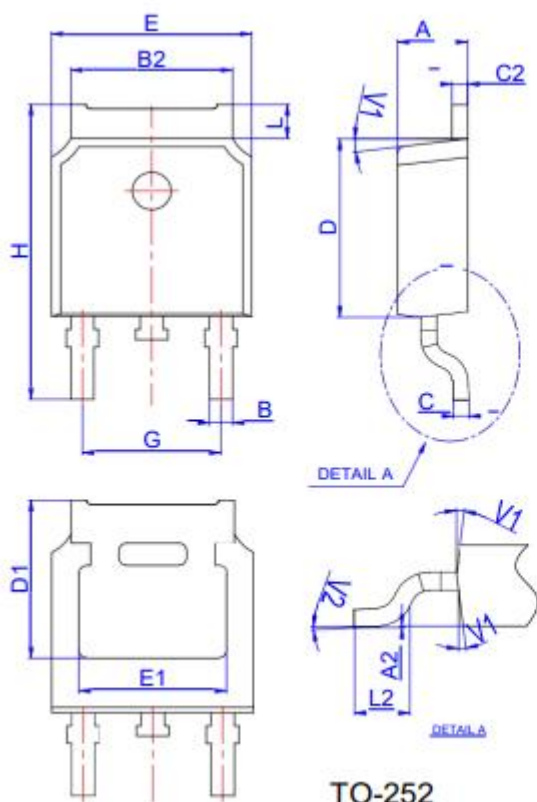
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



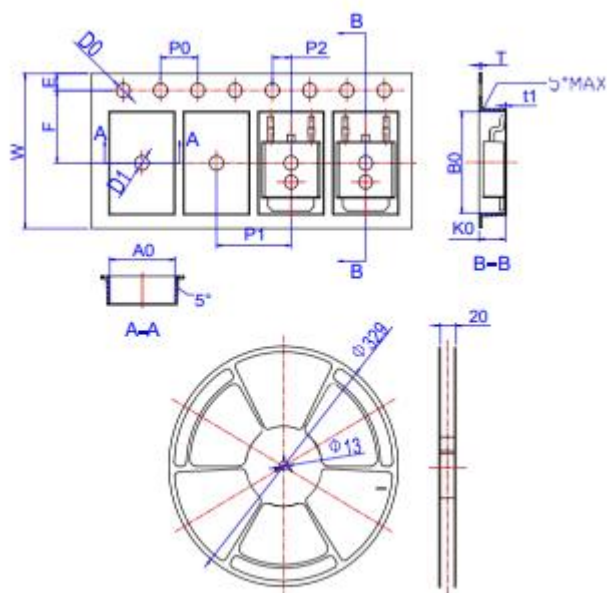
Diode Recovery Test Circuit & Waveforms



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°



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



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