

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

Product Summary

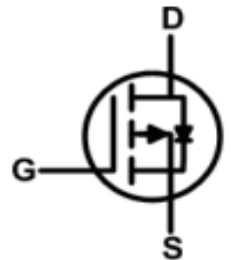
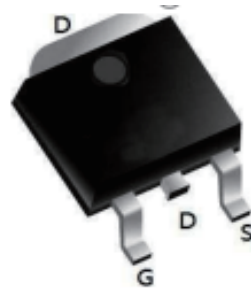


BVDSS	RDS(ON)	ID
-20V	3.8mΩ	-80A

Description

The 80P02 is the high cell density trenched P-ch MOSFETs, which provides excellent RDS(ON) and gate charge for most of the synchronous buck converter applications. The 80P02 meets the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

TO252 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	-20	V
V _{GS}	Gate-Source Voltage	±12	V
I _D	Continuous Drain Current	T _c =25°C	-80
		T _c =100°C	-44
I _{DM}	Pulsed Drain Current ¹	-280	A
EAS	Single Pulse Avalanche Energy ²	80	mJ
P _D	Total Power Dissipation	T _c =25°C	43.1
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C
R _{θJA}	Thermal Resistance from Junction-to-Ambient ³	65	°C/W
R _{θJC}	Thermal Resistance from Junction-to-Case	2.9	°C/W

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

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Units
Static Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	-20	-	-	V
I_{GSS}	Gate-body Leakage current	$V_{DS} = 0V, V_{GS} = \pm 12V$	-	-	± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$T_J = 25^\circ\text{C}$	-	-	-1	μA
		$T_J = 100^\circ\text{C}$	-	-	-100	μA
$V_{GS(th)}$	Gate-Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1	V
$R_{DS(on)}$	Drain-Source On-Resistance ⁴	$V_{GS} = -4.5V, I_D = -10A$	-	3.8	5.2	m Ω
		$V_{GS} = -2.5V, I_D = -10A$	-	5	6.8	m Ω
g_{fs}	Forward Transconductance ⁴	$V_{DS} = -4.5V, I_D = -10A$	-	56	-	S
Dynamic Characteristics⁵						
C_{iss}	Input Capacitance	$V_{DS} = -10V, V_{GS} = 0V, f = 1\text{MHz}$	-	4770	-	pF
C_{oss}	Output Capacitance		-	665	-	
C_{riss}	Reverse Transfer Capacitance		-	570	-	
R_g	Gate Resistance	$f = 1\text{MHz}$	-	9.6	-	Ω
Switching Characteristics⁵						
Q_g	Total Gate Charge	$V_{GS} = -4.5V, V_{DS} = -10V, I_D = -10A$	-	55	-	nC
Q_{gs}	Gate-Source Charge		-	5.2	-	
Q_{gd}	Gate-Drain Charge		-	10	-	
$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = -4.5V, V_{DD} = -10V, R_G = 3\Omega, I_D = -10A$	-	22	-	ns
t_r	Rise Time		-	38	-	
$t_{d(off)}$	Turn-Off Delay Time		-	110	-	
t_f	Fall Time		-	62	-	
Drain-Source Body Diode Characteristics						
V_{SD}	Diode Forward Voltage ⁴	$I_S = -10A, V_{GS} = 0V$	-	-	-1.2	V
I_S	Continuous Source Current	$T_C = 25^\circ\text{C}$	-	-	-80	A

Notes:

- 1.Repetitive rating, pulse width limited by junction temperature $T_J(\text{MAX})=150^\circ\text{C}$.
- 2.The EAS data shows Max. rating. The test condition is $V_{DD} = -25V, V_{GS} = -10V, L = 0.4\text{mH}, I_{AS} = -20A$.
- 3.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, The value in any given application depends on the user's specific board design.
- 4.The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

This value is guaranteed by design hence it is not included in the production test

Typical Electrical and Thermal Characteristics (Curves)

Figure1: Output Characteristics

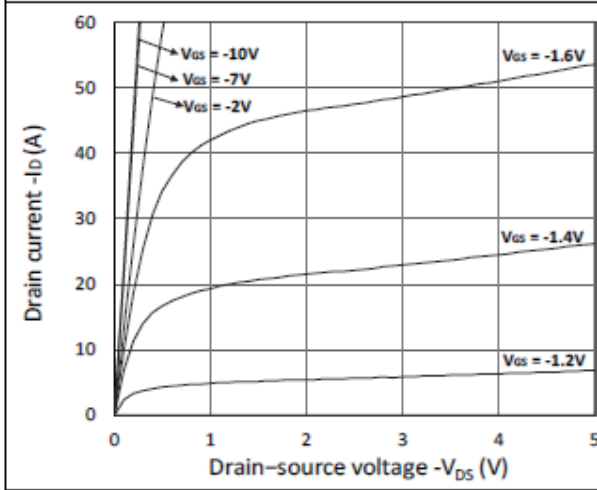


Figure 2: Typical Transfer Characteristics

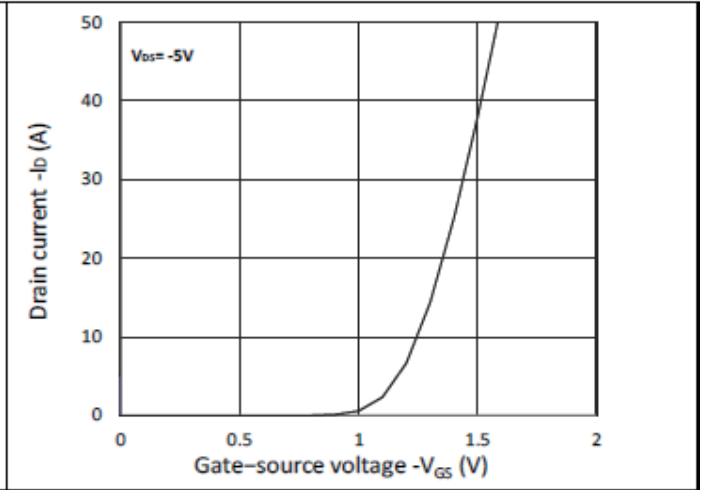


Figure 3: Forward Characteristics of Reverse

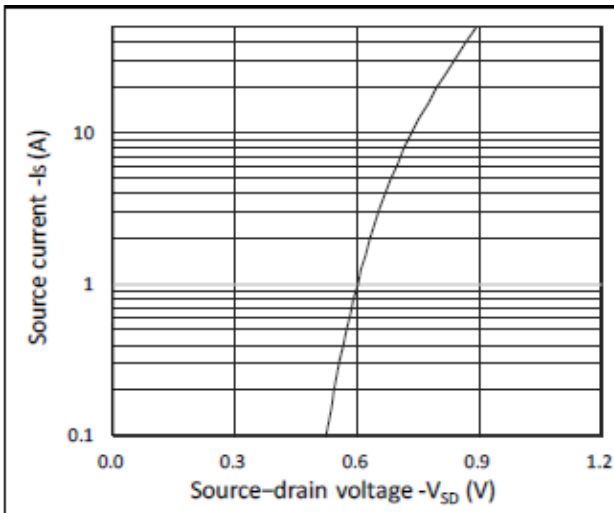


Figure 4: R_DS(ON) vs. V_GS

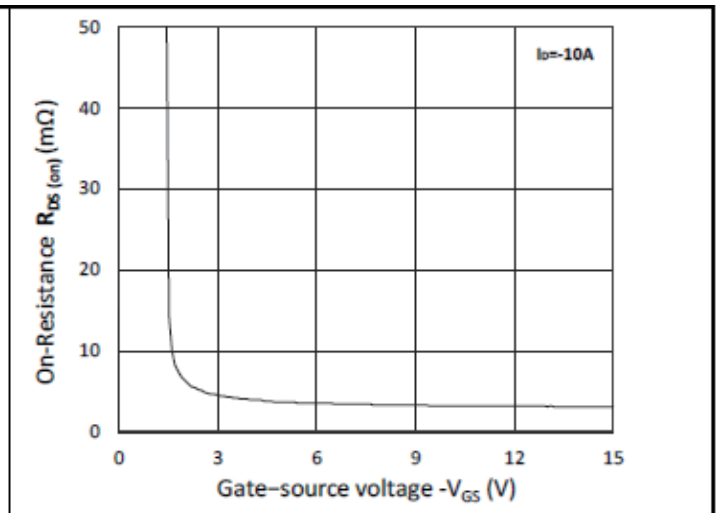


Figure 5: R_DS(ON) vs. I_D

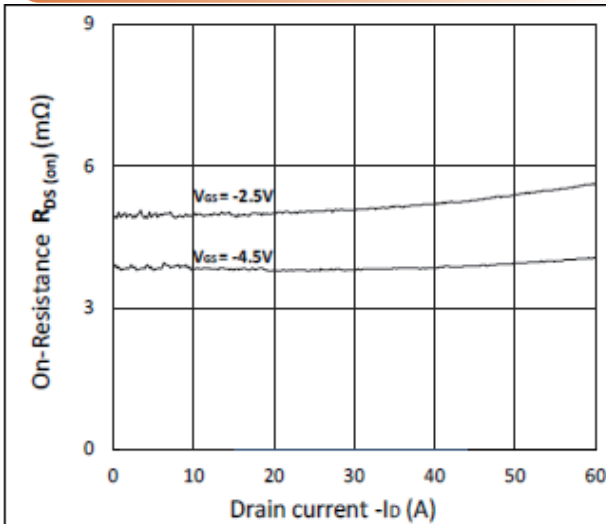
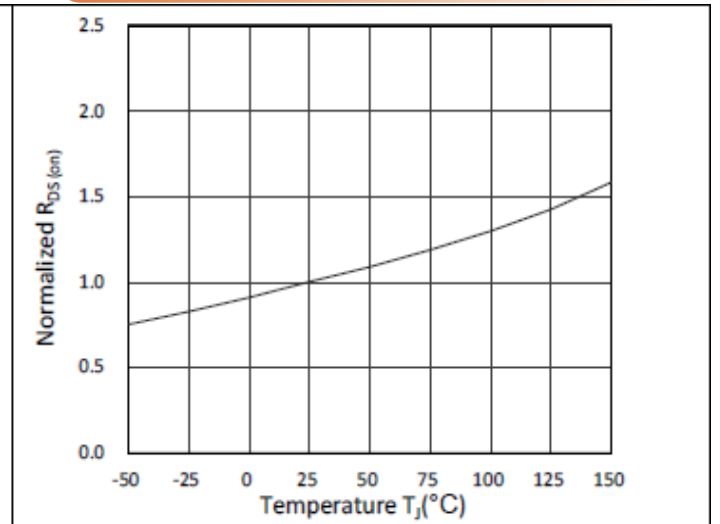


Figure 6: Normalized R_DS(on) vs. Temperature



Typical Performance Characteristics

Figure 7: Capacitance Characteristics

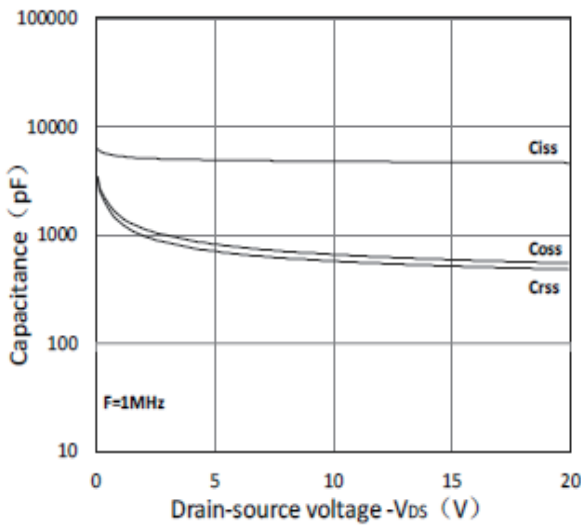


Figure 8: Gate Charge Characteristics

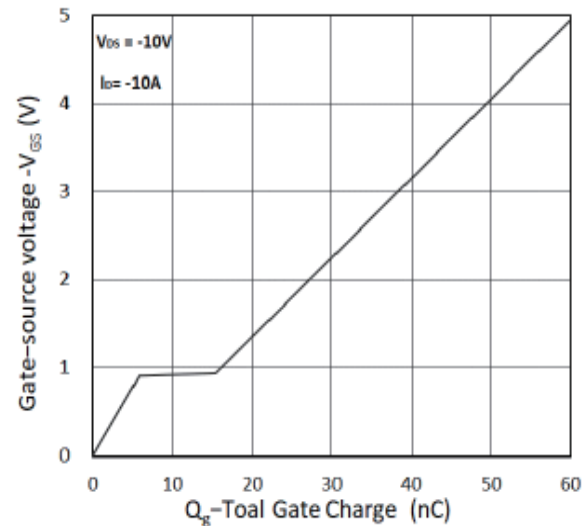


Figure 9: Power Dissipation

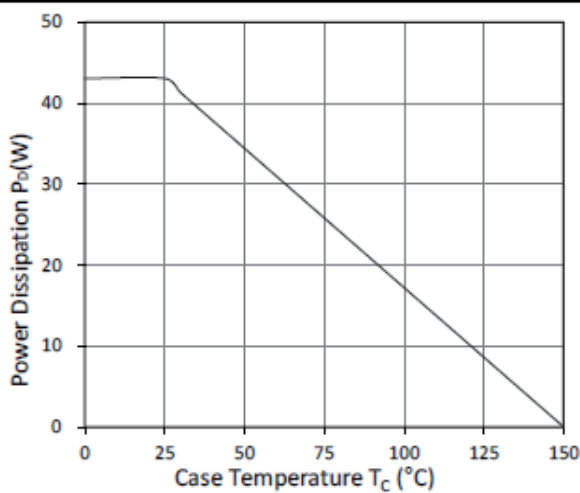


Figure 10: Safe Operating Area

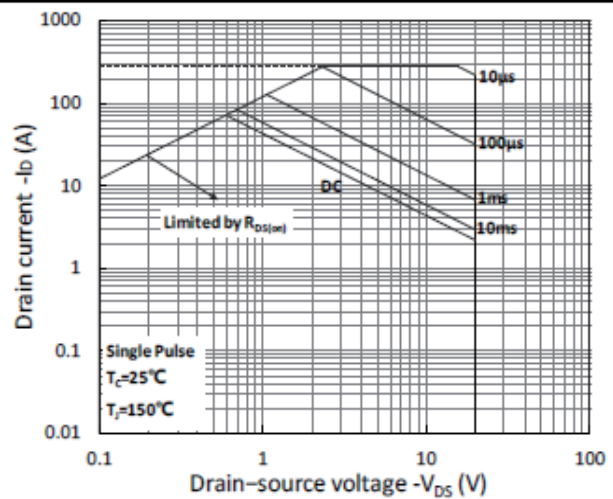
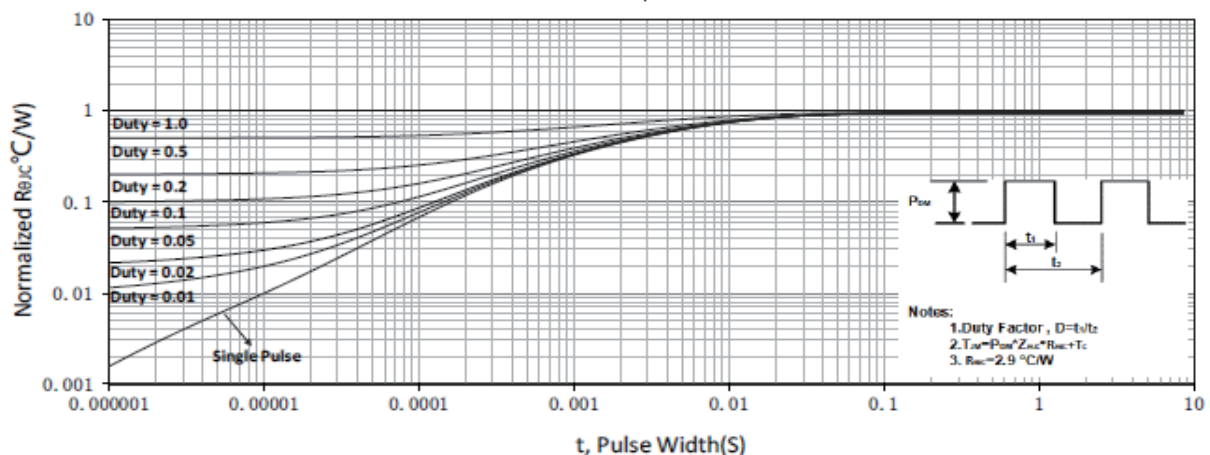
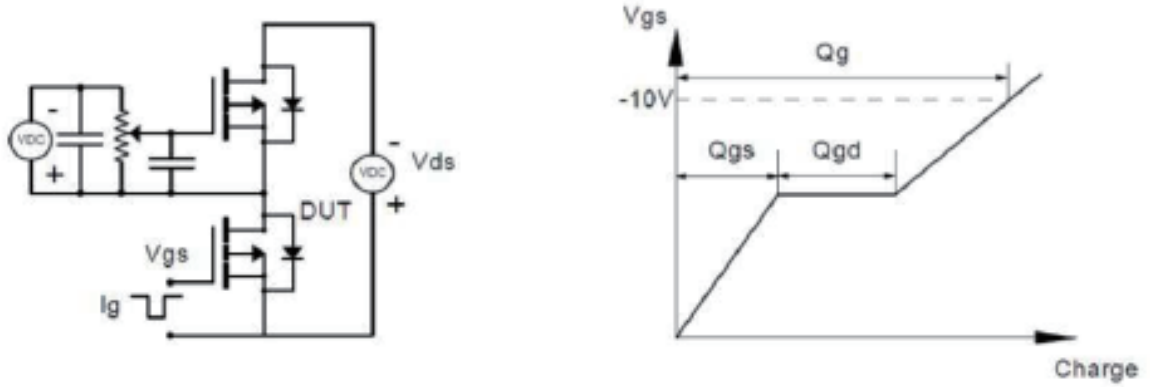


Figure 11: Normalized Maximum Transient Thermal Impedance

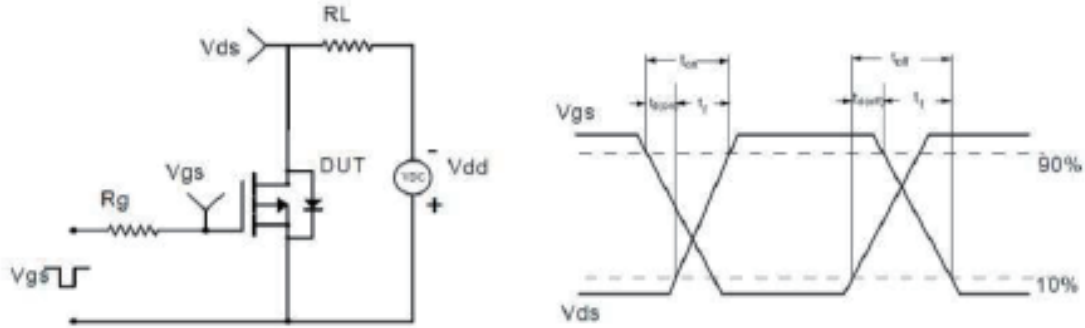


Test Circuit

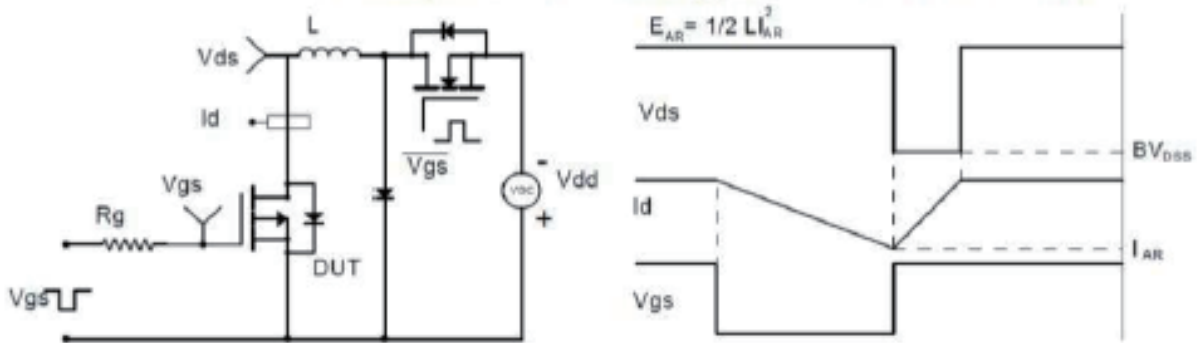
Gate Charge Test Circuit & Waveform



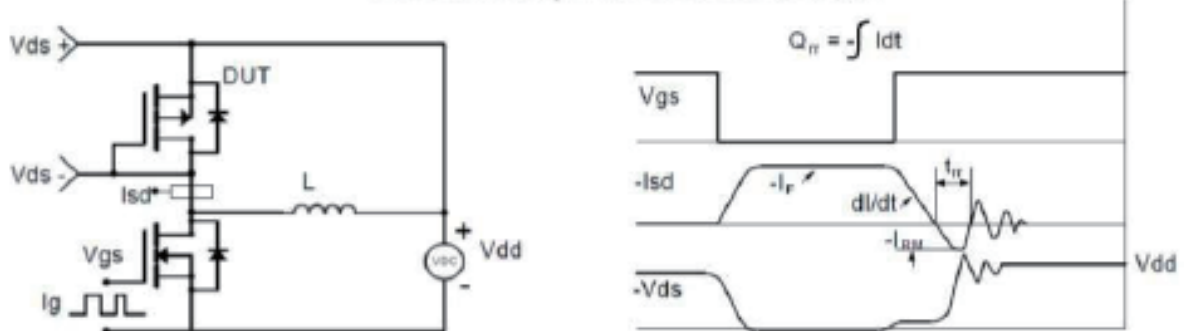
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

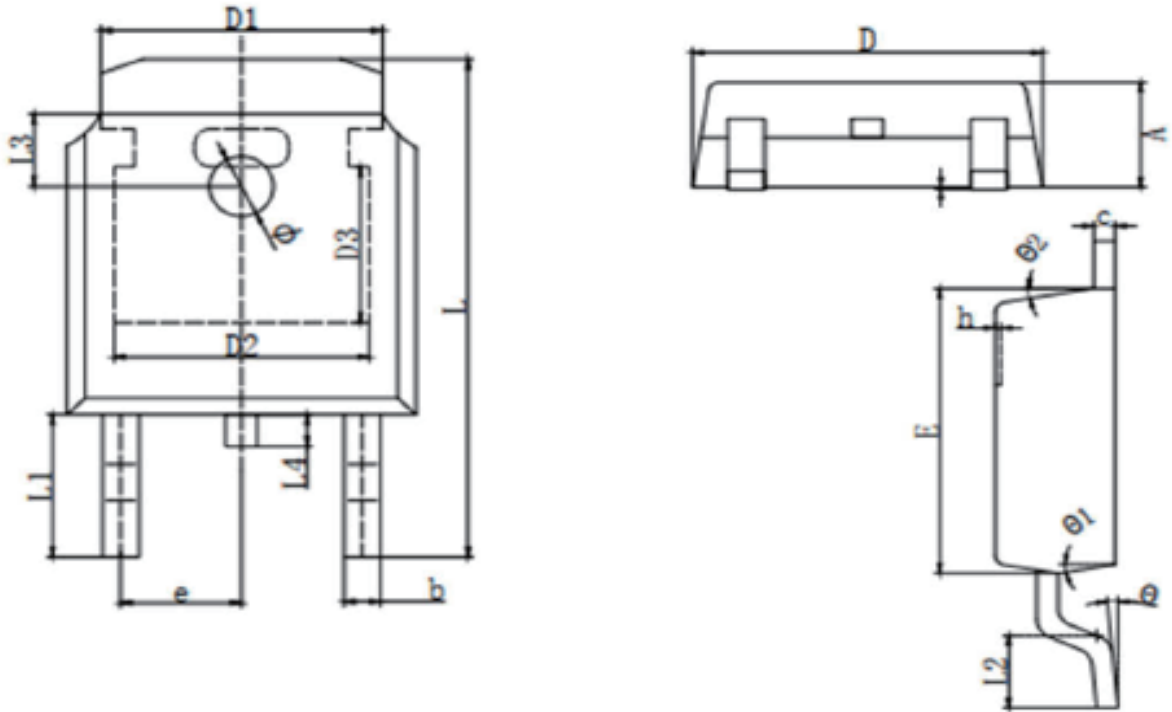


Diode Recovery Test Circuit & Waveforms



Package Mechanical Data TO 252

TO-252 Package outline



SYMBOL	MILLIMETER		SYMBOL	MILLIMETER	
	MIN	MAX		MIN	MAX
A	2.200	2.400	h	0.000	0.200
A1	0.000	0.127	L	9.900	10.30
b	0.640	0.740	L1	2.888 REF	
c	0.460	0.580	L2	1.400	1.700
D	6.500	6.700	L3	1.600 REF	
D1	5.334 REF		L4	0.600	1.000
D2	4.826 REF		ϕ	1.100	1.300
D3	3.166 REF		θ	0°	8°
E	6.000	6.200	$\theta 1$	9° TYP2	
e	2.286 TYP		$\theta 2$	9° TYP	