SC090N75ZTK-R

Silicon Carbide MOSFET 750V, 90mΩ, 36A

重庆平伟半导体股份有限公司

Features

- 0 V turn-off gate voltage can be applied
- High Blocking Voltage with Low RDS(on)
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Qualified according to JEDEC criteria

100% DVDS Tested
100% AvalancheTested

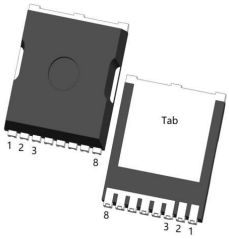
Applications

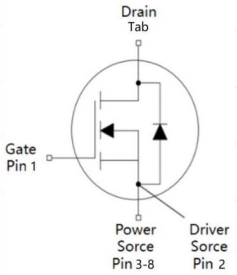
- Lighting
- Telecom and UPS
- PWM stages for e.g. PC Silverbox, Adapter, LCD & PDP TV

Product Summary

V_{DS}	750V
$R_{DS(on)\ typ.}$	90mΩ
I_D	36A

TOLL-02





Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
SC090N75ZTK-R	SC090N75ZTK	TOLL-02	Tape&Reel	13 inches	24mm	1500

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	750	V
Continuous drain current T_C = 25°C T_C = 100°C (Silicon limit)	I_D	 36 25	A
Pulsed drain current (T_C = 25°C)	$I_{D\ pulse}$	107	A
Avalanche energy, single pulse (L=5mH)	E_{AS}	63	mJ
Gate-Source voltage,max.transient voltage	V_{GSmax}	-10/+22	V
Gate-Source voltage,max.static voltage	V_{GSsop}	0/+18	V
Power dissipation T_C = 25°C	P_{tot}	 111	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+175	°C

©ChongQing PingWei Semiconductor CO., LTD

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	R_{thJC}	-	0.9	1.4	°C/W	-
Thermal resistance, junction - ambient(min. footprint)	R_{thJA}	-	-	40	°C/W	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	750	-	-	V	V_{GS}=0V, I_D=500uA
Gate threshold voltage	$V_{GS(th)}$	2.7	3.6	4.5	V	V_{DS}=V_{GS}, I_D=7.5mA
Zero gate voltage drain current	I_{DSS}	-	1	10	μA	V_{DS}=750V,V_{GS}=0V T_j=25°C
		-	-	100		T_j=175°C
Gate-source leakage current	I_{GSS}	-	-	100	nA	V_{GS}=22V,V_{DS}=0V
		-	-	-100	nA	V_{GS}=-10V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	90	120	mΩ	V_{GS}=15V,I_D=17A
Drain-source on-state resistance	$R_{DS(on)}$	-	68	-	mΩ	V_{GS}=18V,I_D=17A
Transconductance	g_{fs}	-	15	-	S	V_{DS}=20V,I_D=17A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	1069	-	pF	V_{GS}=0V, V_{DS}=400V, f=1MHz
Output Capacitance	C_{oss}	-	82	-		
Reverse Transfer Capacitance	C_{rss}	-	4	-		
Gate Total Charge	Q_G	-	30	-	nC	V_{DS}=400V,I_D=17A ,V_{GS}=0V/15V
Gate-Source charge	Q_{gs}	-	10	-		
Gate-Drain charge	Q_{gd}	-	13	-		
Turn-on delay time	$t_{d(on)}$	-	12	-	ns	V_{GS}=0/18V, V_{DD}=400V, R_G=5.1Ω,I_D=16A
Rise time	t_r	-	32	-		
Turn-off delay time	$t_{d(off)}$	-	12	-		
Fall time	t_f	-	13	-		
Gate resistance	R_G	-	1.0	-	Ω	V_{GS}=0V, f=1MHz

©ChongQing PingWei Semiconductor CO., LTD

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	3.3	-	V	V_{GS}=0V, I_{SD}=8.5A T_j=25°C
		-	2.8	-		T_j=175°C
Body Diode Continuous Forward Current	I_S	-	-	36	A	T_C = 25°C
		-	-	30	A	T_C = 100°C
Body Diode Reverse Recovery Time	t_{rr}	-	52	-	ns	V_{GS}=-5V,I_{SD}=17A, V_R=400V di/dt=1000A/us
Body Diode Reverse Recovery Charge	Q_{rr}	-	110	-	nC	
Peak Reverse Recovery Current	I_{RRM}	-	4.2	-	A	

©ChongQing PingWei Semiconductor CO., LTD

Typical Performance Characteristics

Fig 1: Output Characteristics Tj=25°C

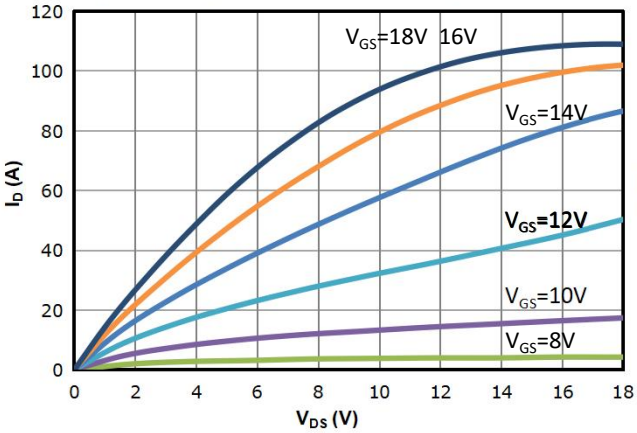


Fig 2: Output Characteristics Tj=175°C

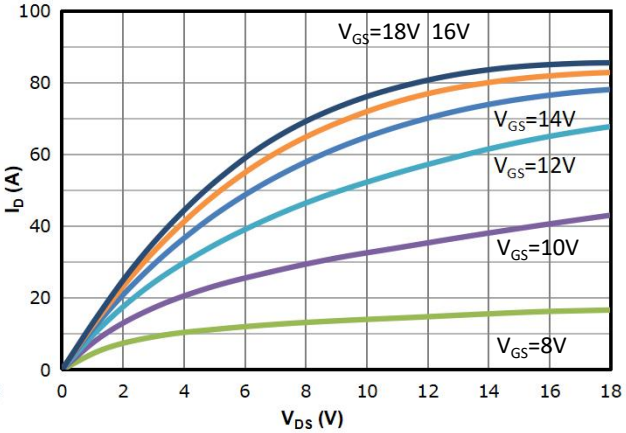


Fig 3: Transfer Characteristics

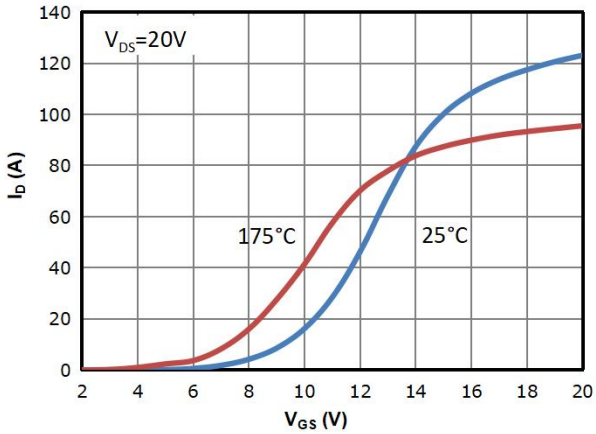


Fig 4: Rds(on) vs Drain Current and Gate Voltage

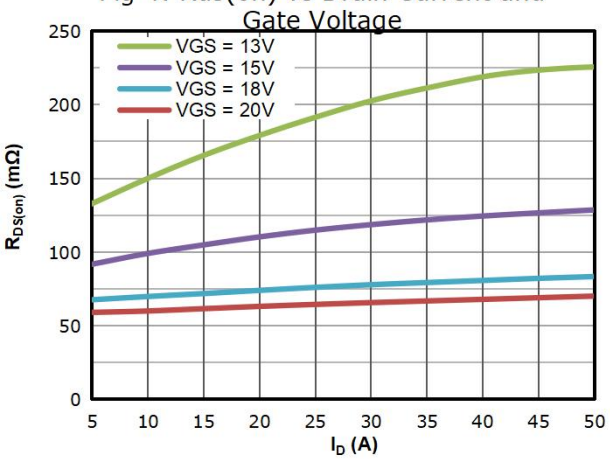


Fig 5: Rds(on) vs. Temperature

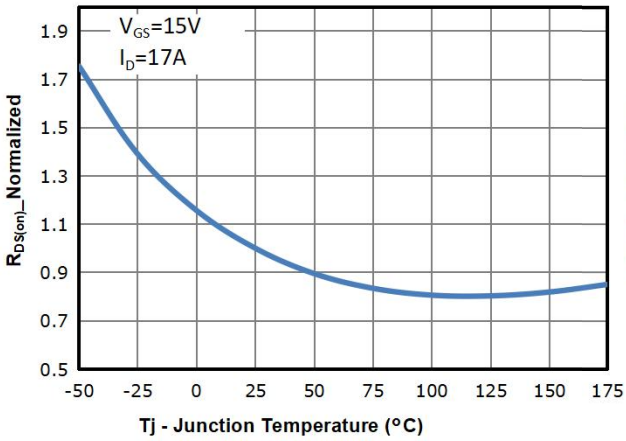
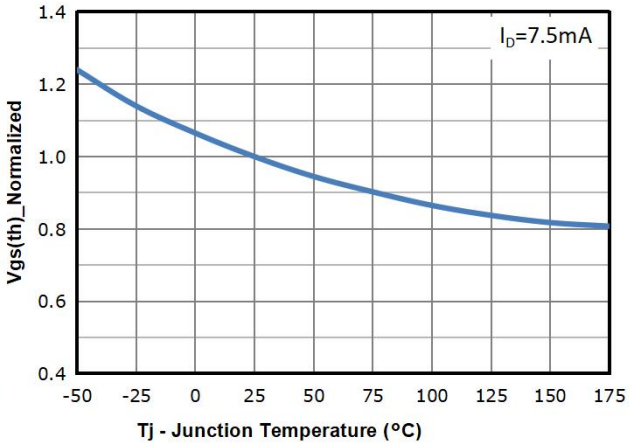


Fig 6: Vgs(th) vs. Temperature



©ChongQing PingWei Semiconductor CO., LTD

Fig 7: BVdss vs. Temperature

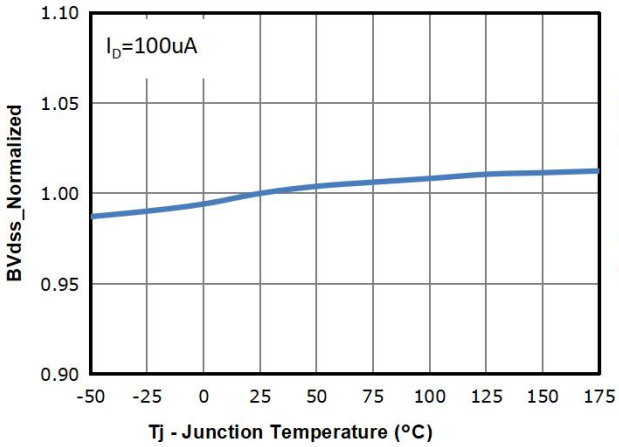


Fig 8: Capacitance Characteristics

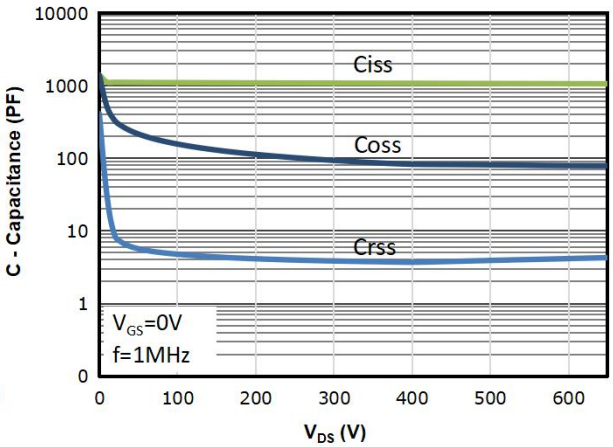


Fig 9: Gate ChargeCharacteristics

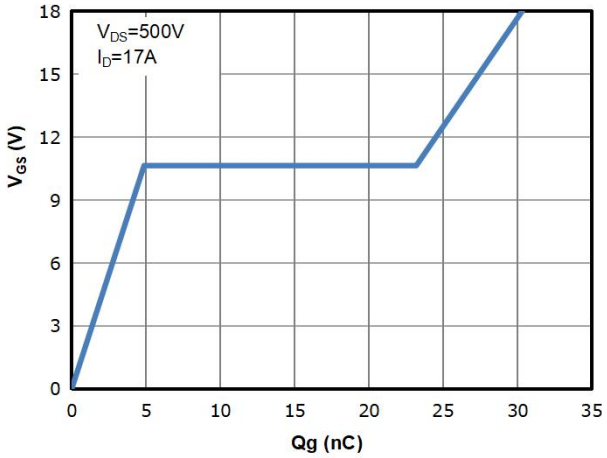


Fig 10: Body-diode Forward Characteristics

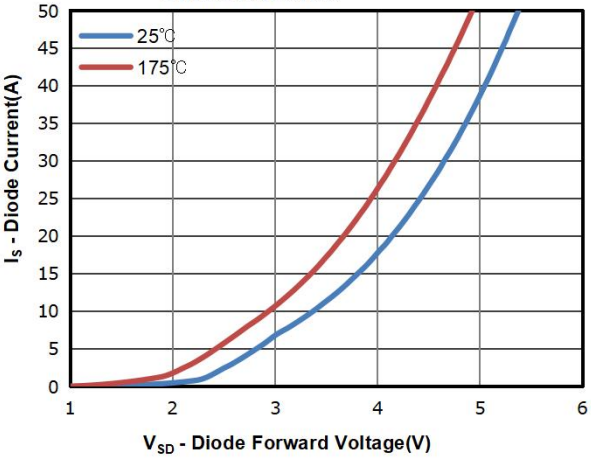


Fig 11: Power Dissipation

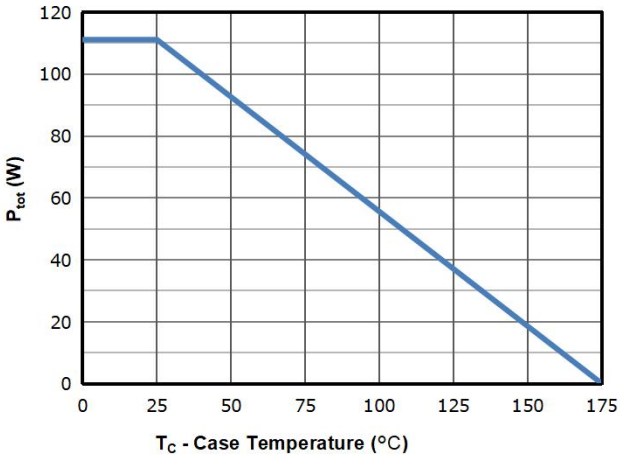
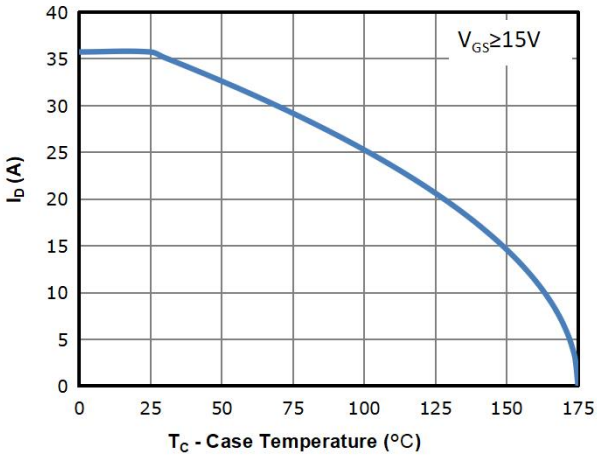


Fig 12: Drain Current Derating



©ChongQing PingWei Semiconductor CO., LTD

Fig 13: Safe Operating Area

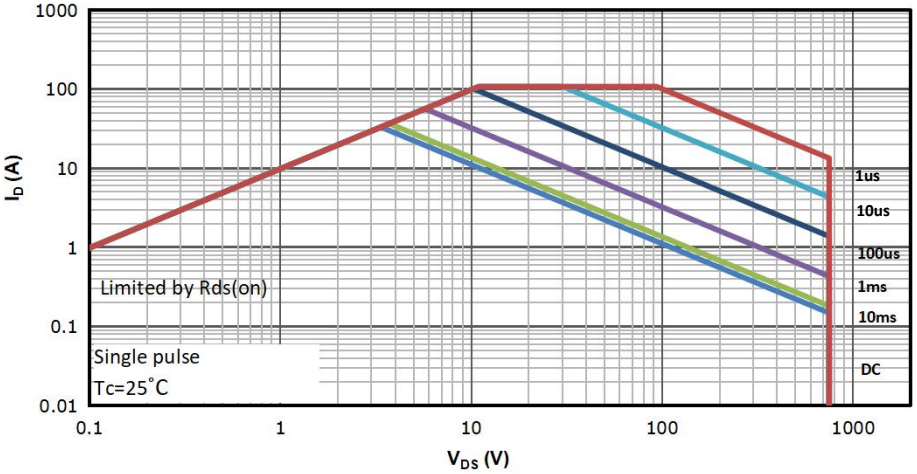
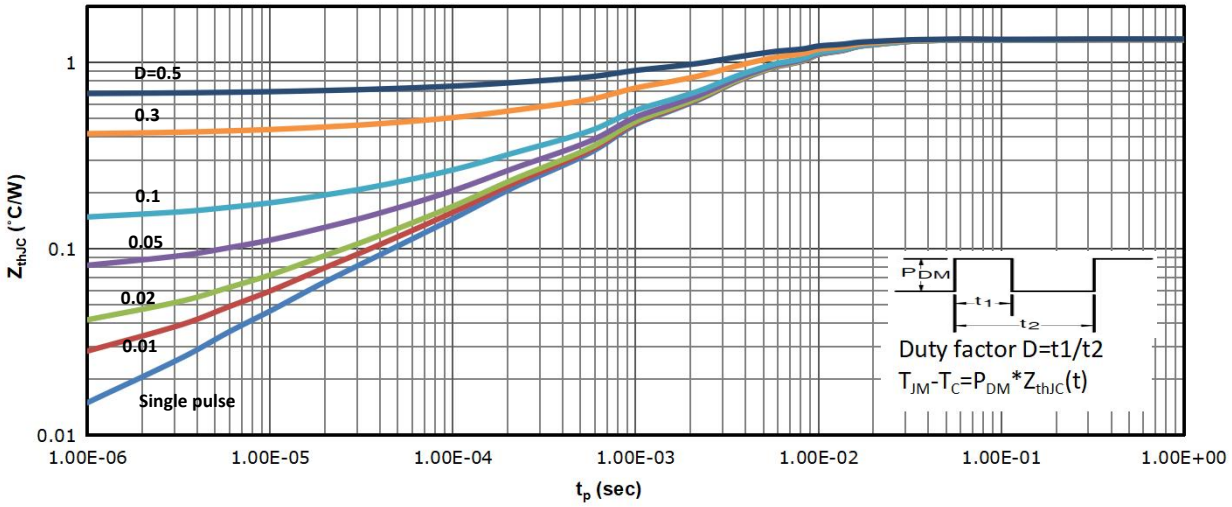


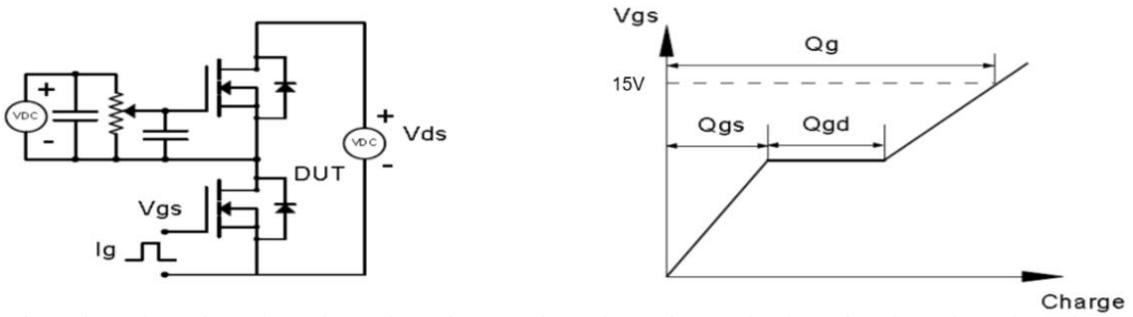
Fig 14: Max. Transient Thermal Impedance



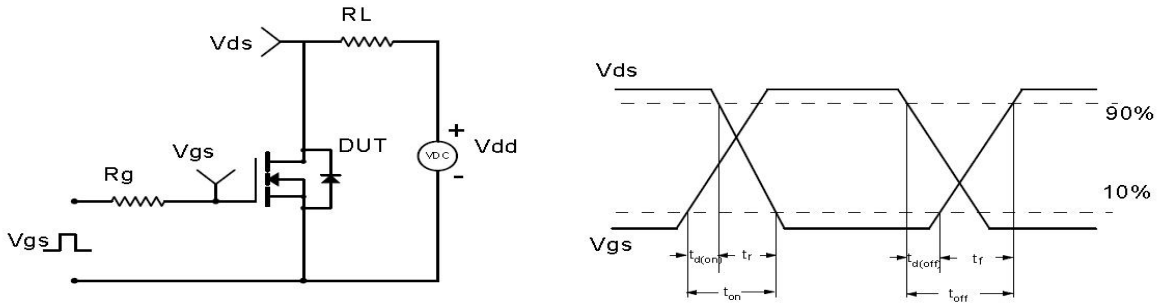
©ChongQing PingWei Semiconductor CO., LTD

Test Circuit & Waveform

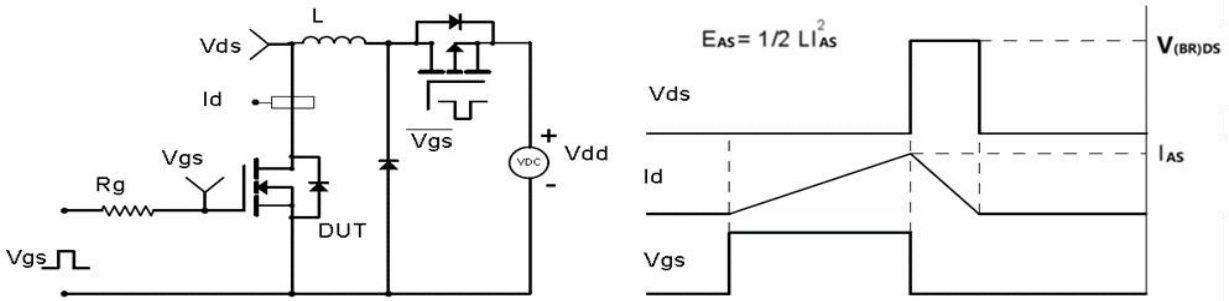
Gate Charge Test Circuit & Waveform



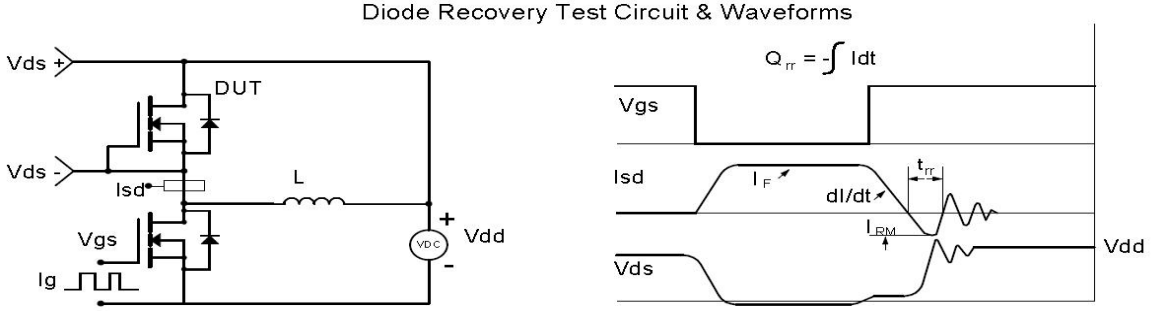
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

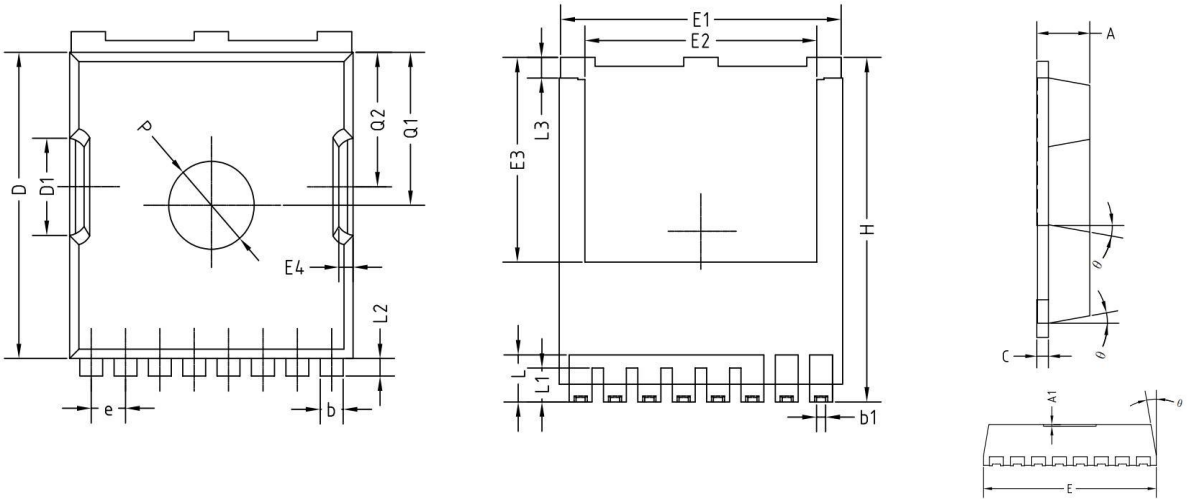


Diode Recovery Test Circuit & Waveforms



©ChongQing PingWei Semiconductor CO., LTD

Package Outline: TOLL-02



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	2.40	0.087	0.094
A1	0.05	0.20	0.002	0.008
b	0.65	0.85	0.026	0.033
b1	0.30	0.50	0.012	0.020
C	0.35	0.65	0.014	0.026
D	10.35	10.70	0.407	0.421
D1	3.15	3.45	0.124	0.136
E	9.80	10.00	0.386	0.394
E1	9.65	9.95	0.380	0.392
E2	7.90	8.30	0.311	0.327
E3	6.80	7.20	0.268	0.283
E4	0.30	0.75	0.012	0.030
e	1.15	1.25	0.045	0.049
L	1.35	1.85	0.053	0.073
L1	0.95	1.35	0.037	0.053
L2	0.40	0.80	0.016	0.031
L3	0.60	0.85	0.024	0.033
θ	7°	12°	7°	12°
P	2.90	3.10	0.114	0.122
Q	4.50	4.70	0.177	0.185
Q1	5.10	5.30	0.201	0.209
H	11.55	11.95	0.455	0.470

©ChongQing PingWei Semiconductor CO., LTD

Disclaimer

Any and all semicondutor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

Unless otherwise specified in the datasheet, the product is designed and qulified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

Buyer is responsible for its products and applications using PingWei products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by PingWei.

"Typical" parameters which may be provided in PingWei data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE

©ChongQing PingWei Semiconductor CO., LTD