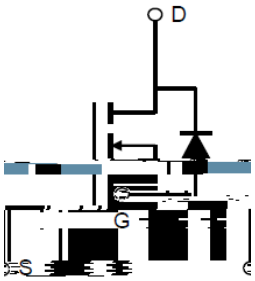
N TO-252 N-CHANNEL MOSFET in a TO-252 Plastic Package.

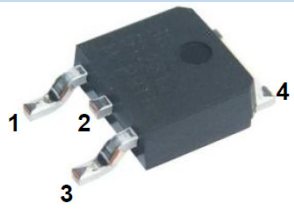
$R_{DS(on)}$ C_{rss}

Low $R_{DS(on)}$,low gate charge, low C rss , fast switching.

DC/DC

Suited for low voltage applications such as automotive, DC/DC Converters, and high efficiency switching for power management in portable and battery operated products.





PIN1 G PIN 2 D PIN 3 S PIN 4 D

See Marking Instructions.

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	100	V
Drain Current	I_D(Tc=25)	30	A
Drain Current	I_D(Tc=100)	20	A
Drain Current - Pulsed [C]	I_{DM}	70	A
Gate-Source Voltage	V_{GS}	±20	V
Avalanche Current [C]	I_{AS}	18.3	A
Avalanche energy L=0.5mH [C]	E_{AS}	133	mJ
Power Dissipation [B]	P_D(Tc=25)	100	W
	P_D(Tc=100)	50	W
Power Dissipation [A]	P_{DSM}(T_A=25)	2.5	W
	P_{DSM}(T_A=70)	1.6	W
Junction and Storage Temperature Range	T_j T_{stg}	-55 150	

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V	I_D=-250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V	V_{GS}=0V			1.0	μA
		V_{DS}=100V T_J=55°C	V_{GS}=0V			5.0	μA
Gate-Body Leakage Current Forward	I_{GSS}	V_{GS}=±20V	V_{DS}=0V			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}	I_D=250μA	1	1.4	2.5	V

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1.0MHz		888		pF
Output Capacitance	C_{oss}			9.4		
Reverse Transfer Capacitance	C_{rss}			72		
Gate resistance	R_g	V_{GS}=0V V_{DS}=0V f=1MHz		1.61		Ω
Total Gate Charge	Q_g(10V)	V_{GS}=10V V_{DS}=50V I_D=10A	26	34	44	nC
Total Gate Charge	Q_g(4.5V)		14	18	22	
Gate Source Charge	Q_{gs}		4	6	8	
Gate Drain Charge	Q_{gd}		5	9	13	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V V_{DS}=50V R_L=5Ω R_{GEN}=3Ω		7		ns
Turn-On Rise Time	t_r			7		
Turn-Off Delay Time	$t_{d(off)}$			29		
Turn-Off Fall Time	t_f			7		
Body Diode Reverse Recovery Time	t_{rr}	I_F=10A dI/dt=500A/ms	22	32	42	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=10A dI/dt=500A/ms	140	200	260	nC
Maximum Junction-to-Ambient [A]	$R_{\theta JA}$	t ≤ 10s		14.2	20	/W
Maximum Junction-to-Ambient [AD]		teady-State		39	50	/W
Maximum Junction-to-Case	$R_{\theta JC}$	teady-State		0.8	1.5	/W

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150°C may be used if the PCB allows it.

B. The power dissipation PD is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =25°C.

D. The RqJA is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.

E. The static characteristics in Figures 1to6 are obtained using <300ms pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=150 °C. The SOA curve provides a single pulse rating.

G. The maximum current rating is package limited.

H. These tests are performed with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

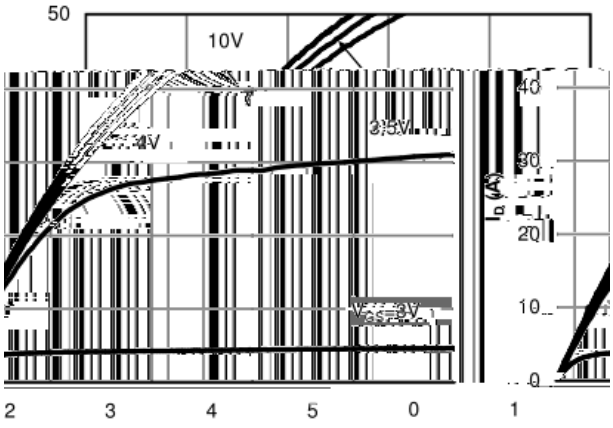


Fig 1: On-Regi

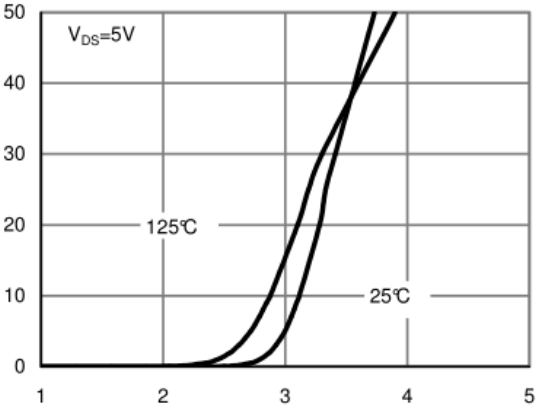


Figure 2: Transfer Characteristics

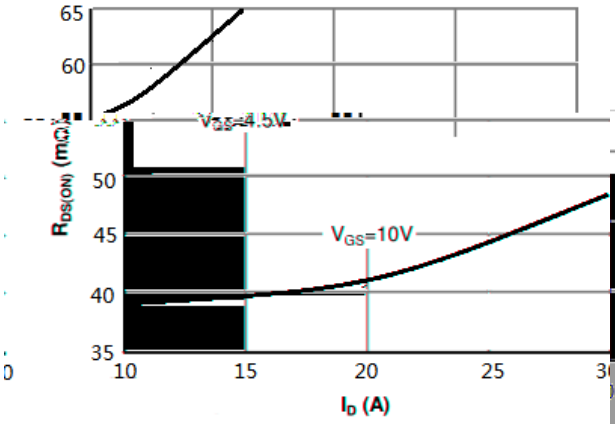


Figure 3: On-Resistance vs. Drain Current and Gat

Voltage

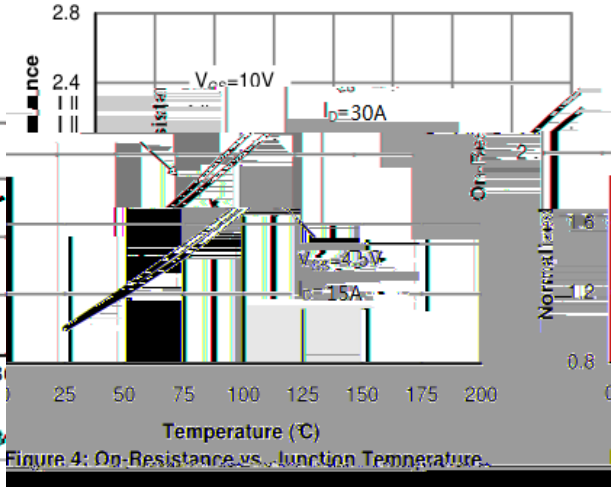
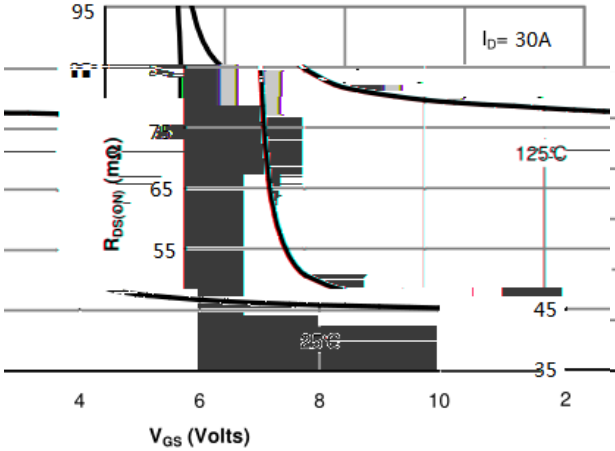


Figure 4: On-Resistance vs. Junction Temperature



ıre 5: On-Resistance vs. Gate-Source Voltage

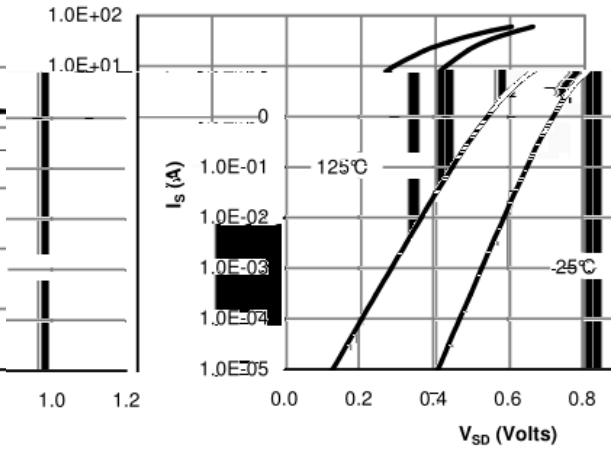


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Figure 6: Body-Diode Charact

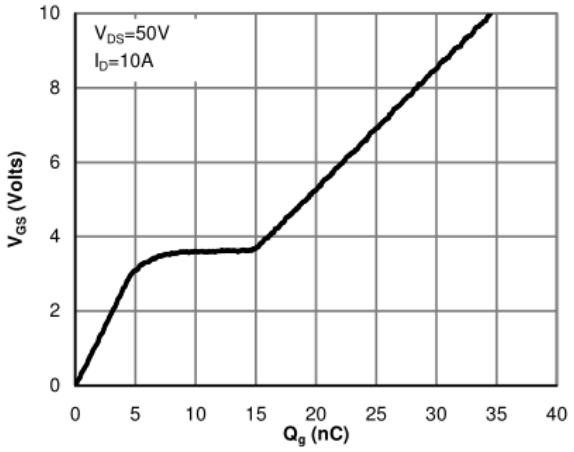


Figure 7: Gate-Charge Characteristics

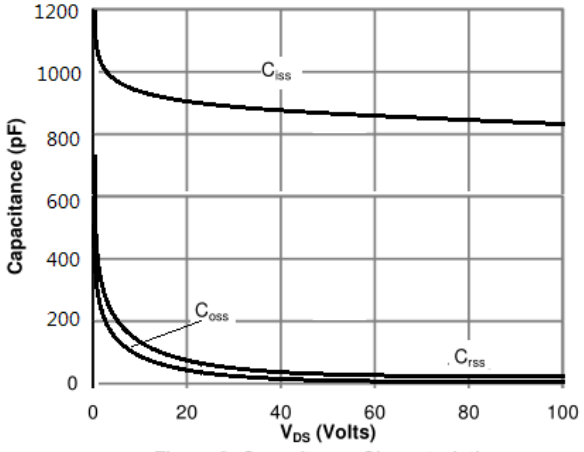


Figure 8: Capacitance Characteristics

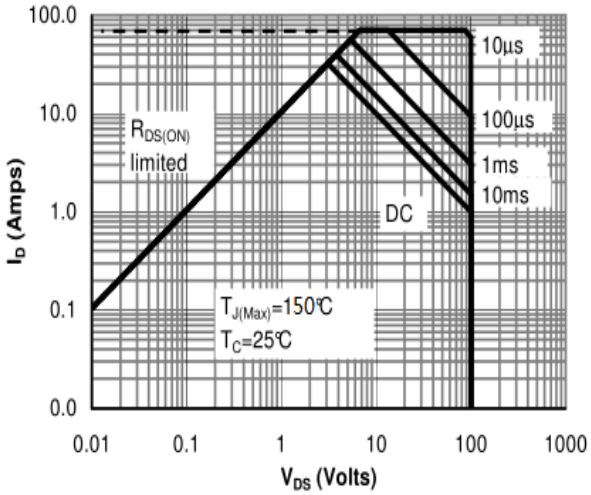


Figure 9: Maximum Forward Biased Safe Operating Area

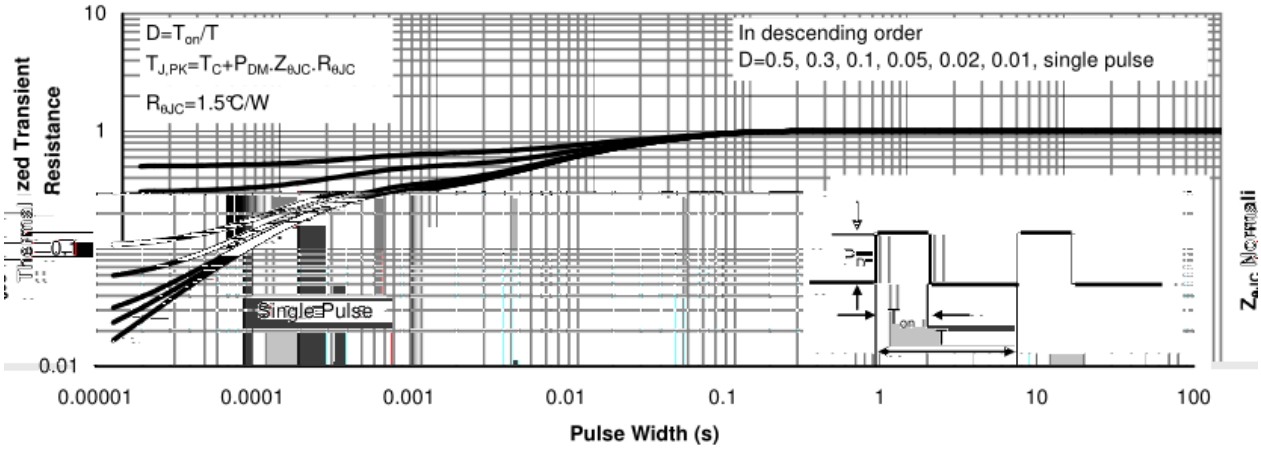
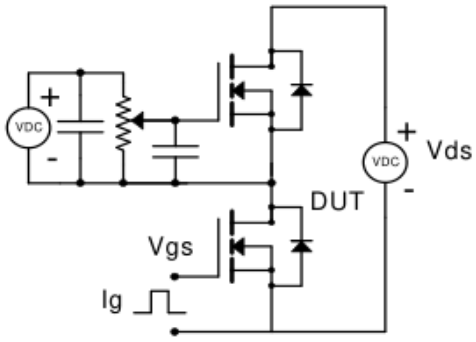
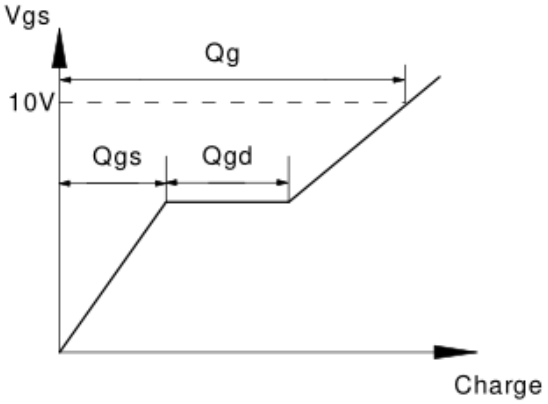


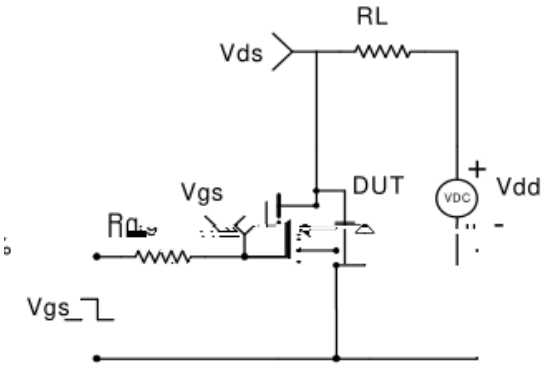
Figure 10: Normalized Maximum Transient Thermal Impedance

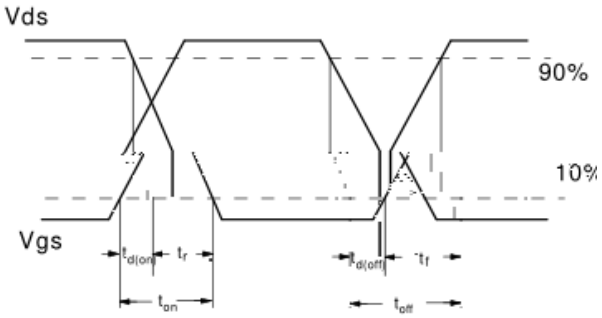
Gate Charge Test Circuit & Waveform



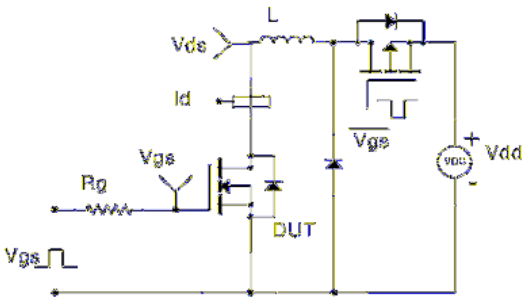


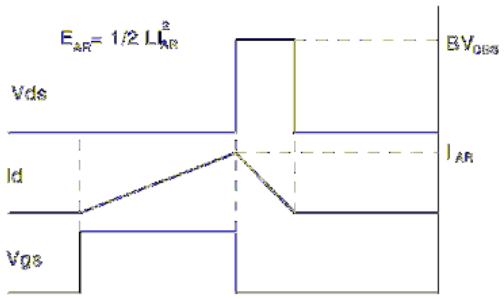
Resistive Switching Test Circuit & Waveforms



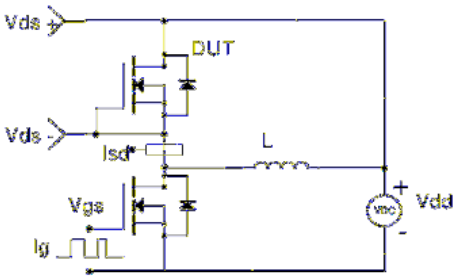


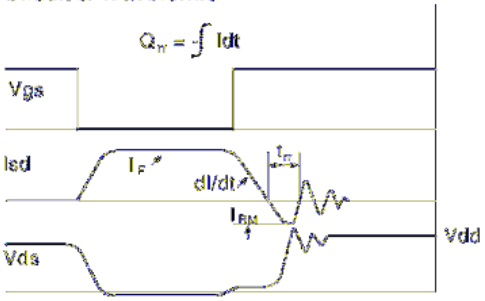
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

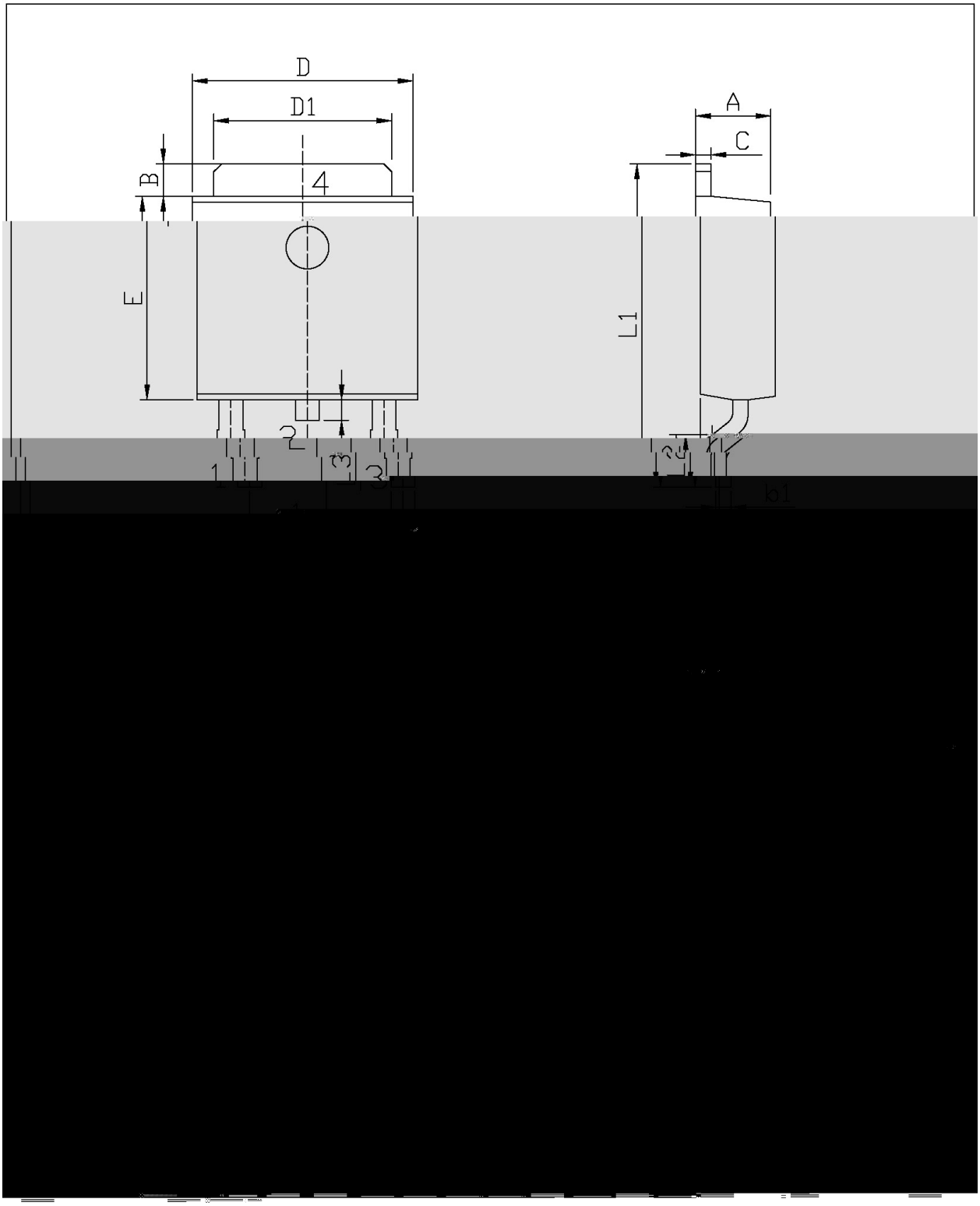




Diode Recovery Test Circuit & Waveforms



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D1
B
4
E
A
C
L1
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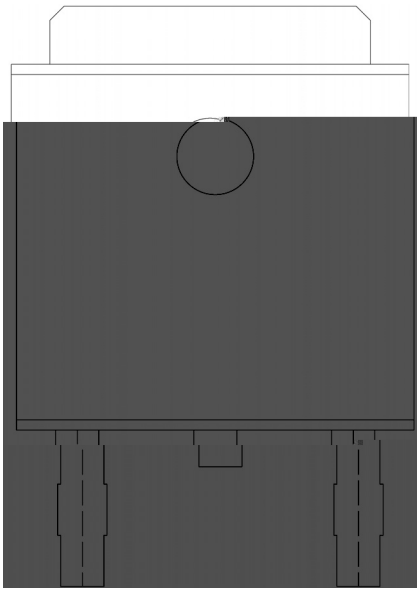
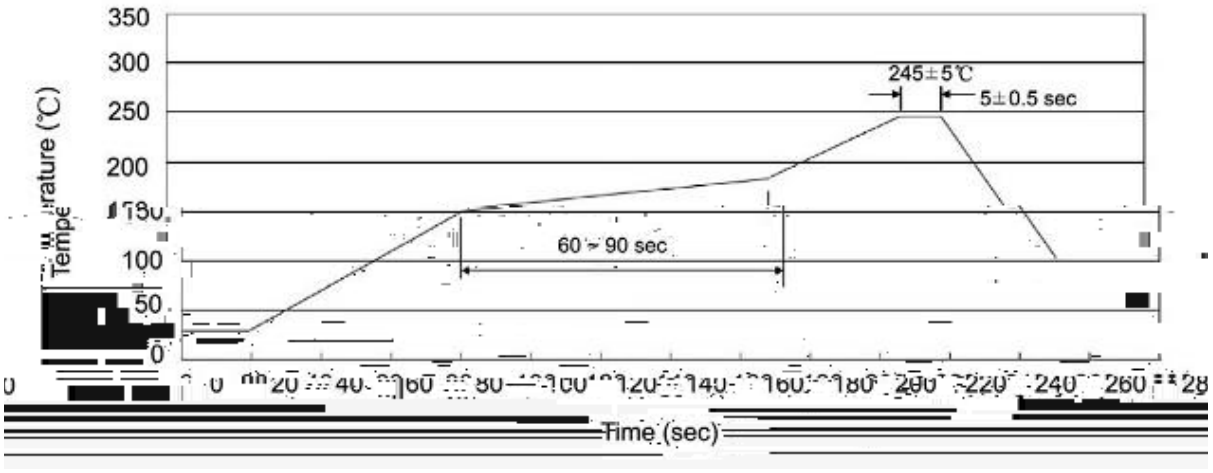


Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

1 150 180 60 90sec;

1.Preheating:150~180 , Time:60~90sec.

2 245±5 5±0.5sec;

2.Peak Temp.:245±5 , Duration:5±0.5sec.

3 2 10 /sec.

3. Cooling Speed: 2~10 /sec.

260±5 10±1 sec. Temp.:260±5 Time:10±1 sec

/ REEL

Package Type	Units					Dimension		(unit mm^3)
	Units/Reel /	Reels/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Reel	Inner Box	Outer Box
TO-252	2,500	2	5,000	6	30,000	13 ×16	360×360×50	380×335×366

/ TUBE

Package Type	Units					Dimension		(unit mm^3)
	Units/Tube /	Tubes/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Tube	Inner Box	Outer Box
TO-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180