

P-channel Enhancement Mode Power MOSFET

Features

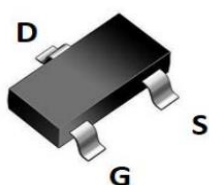
- Halogen free; RoHS compliant
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Pb free plating
- 100% UIS TESTED!
- 100% ΔV_{DS} TESTED!

Product Summary

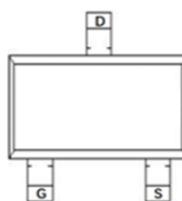
Parameters	Value	Unit
V_{DSS}	-12	V
$V_{GS(th_Typ)}$	-0.6	V
$I_D(@V_{GS}=-10V)$	-4.1	A
$R_{DS(ON)_Typ} @V_{GS}=-4.5V$	24	m Ω
$R_{DS(ON)_Typ} @V_{GS}=-2.5V$	29	m Ω

Applications

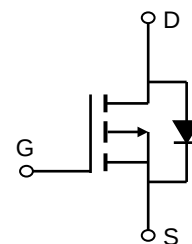
- Load Switch
- PWM Application
- Power Management



SOT23-3 Top View



Marking



Schematic Diagram

Ordering Information

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK17P05A	17P05	SOT23	Reel	N/A	N/A	3000

MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-12	V
Gate-Source Voltage		V_{GS}	± 12	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	-4.1	A
	$T_C = 100^{\circ}\text{C}$		-2.9	
Pulsed Drain Current		I_{DM}	Refer to Fig.4	A
Power Dissipation		P_D	1.2	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	106	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^{\circ}\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D = -250uA	-12			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -12V, V _{GS} =0V			1.0	μA
Gate-body leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} =±12V			±100	nA
On characteristics ④						
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-0.4	-0.6	-1.0	V
Static drain-source on-sate resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-4.1A		24	31	mΩ
		V _{GS} =-2.5V, I _D =-3A		29	38	mΩ
Dynamic characteristics ④ ⑤						
Input capacitance	C _{iss}	V _{DS} =-6V,V _{GS} =0V f =1MHz		1010		pF
Output capacitance	C _{oss}			130		
Reverse transfer capacitance	C _{rss}			106		
Switching characteristics ④ ⑤						
Total gate charge	Q _g	V _{GS} =0 to -4.5V V _{DS} =-6V, I _D =-2A		10		nC
Gate-source charge	Q _{gs}			2		
Gate-drain charge	Q _{gd}			1		
Turn-on delay time	t _{d(on)}	V _{DD} =-6V,I _D =-2A V _{GS} =-10V,R _{GEN} =2.7Ω		5		ns
Turn-on rise time	t _r			12		
Turn-off delay time	t _{d(off)}			50		
Turn-off fall time	t _f			23		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V _{SD} ④	V _{GS} =0V, I _S =-4.1A			1.2	V
Continuous drain-source diode forward current	I _S ①				-4.1	A
Pulsed drain-source diode forward current	I _{SM} ②				-16	A
Reverse recovery time	t _{rr}	di/dt = 60A/μs, I _F = -2A		9		ns
Reverse recovery charge	Q _{rr}			1.3		nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. R θ JA is measured with the device mounted on a minimum recommended pad of 2oz copper FR4 PCB.
3. R θ JA is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB.
4. Pulse Test: Pulse Width $\leq$ 300 μs , Duty Cycle $\leq$ 0.5%.

Typical Performance Characteristics

Figure 1: Power De-rating

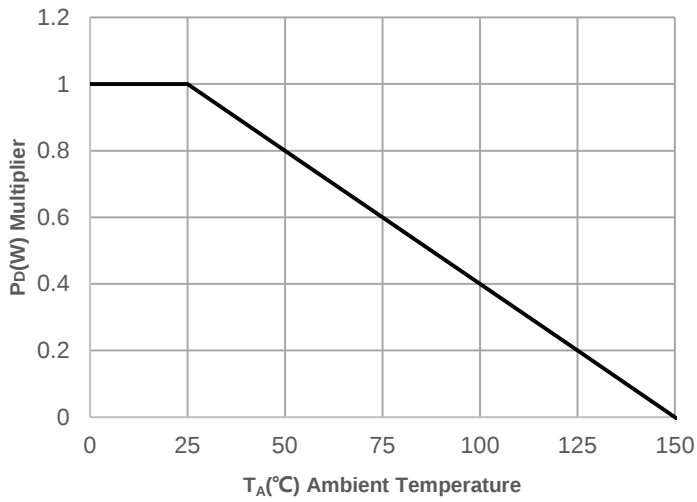


Figure 2: Current De-rating

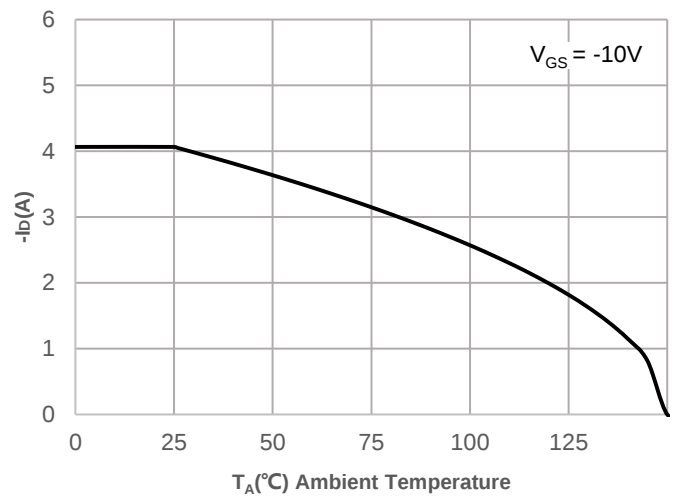


Figure 3: Normalized Maximum Transient Thermal Impedance

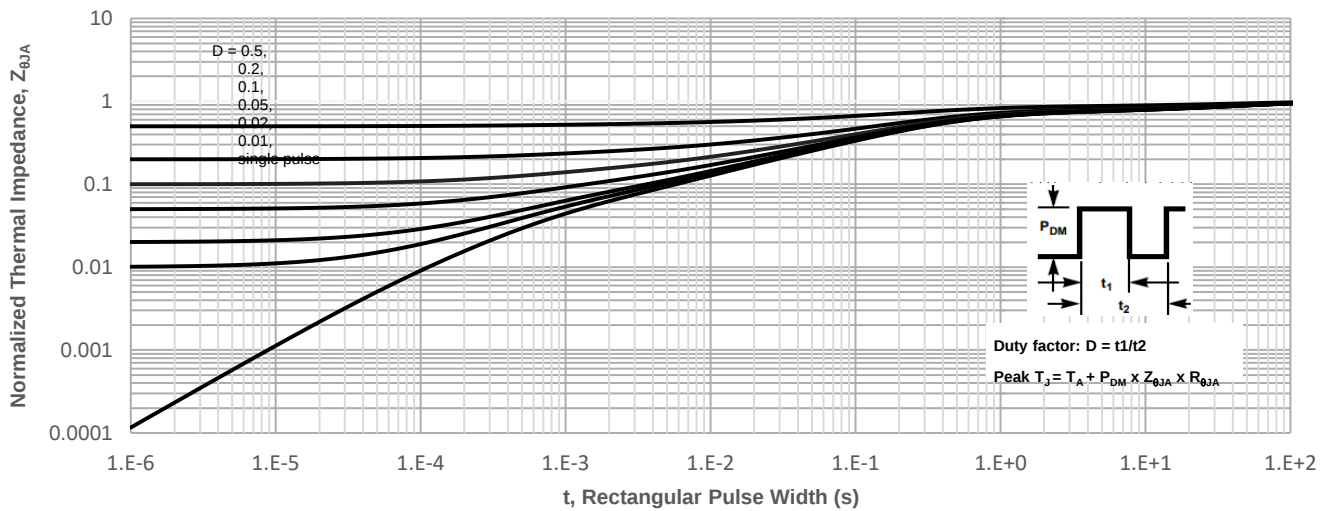
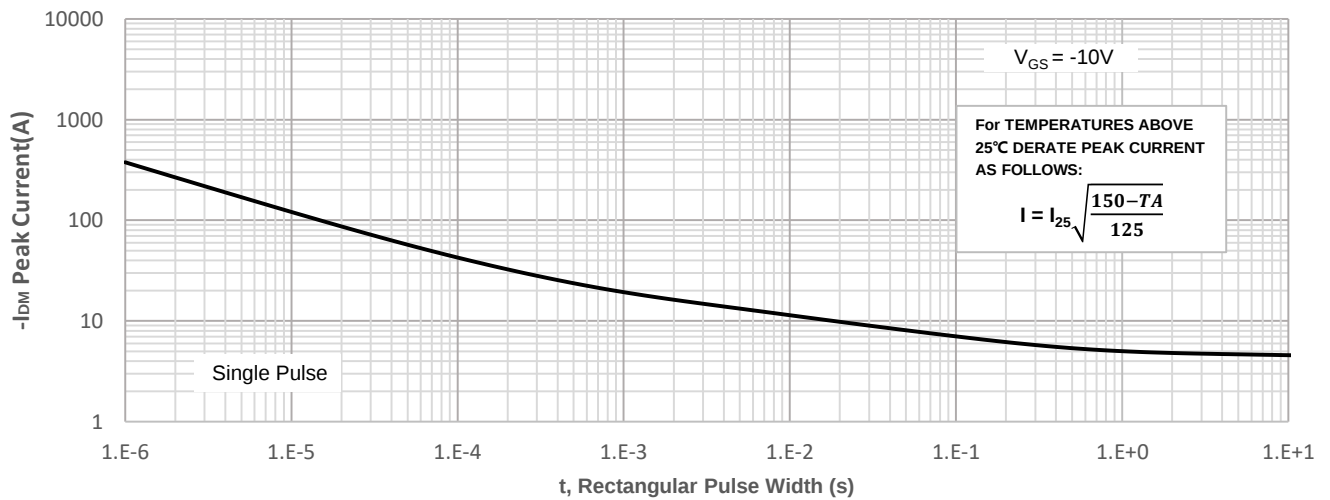


Figure 4: Peak Current Capacity



Typical Performance Characteristics

Figure 5: Output Characteristics

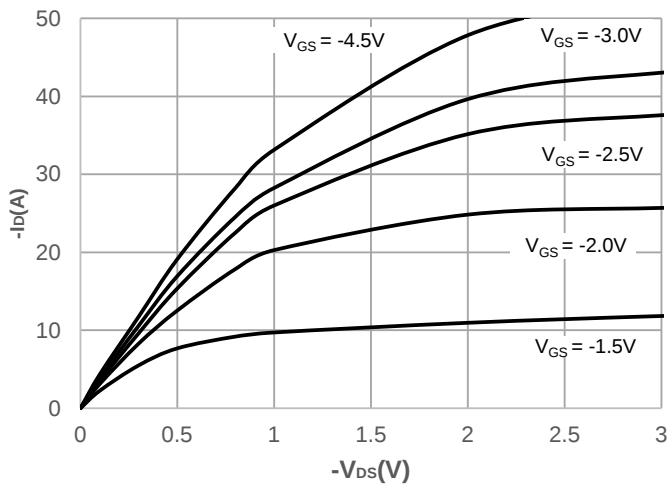


Figure 6: Typical Transfer Characteristics

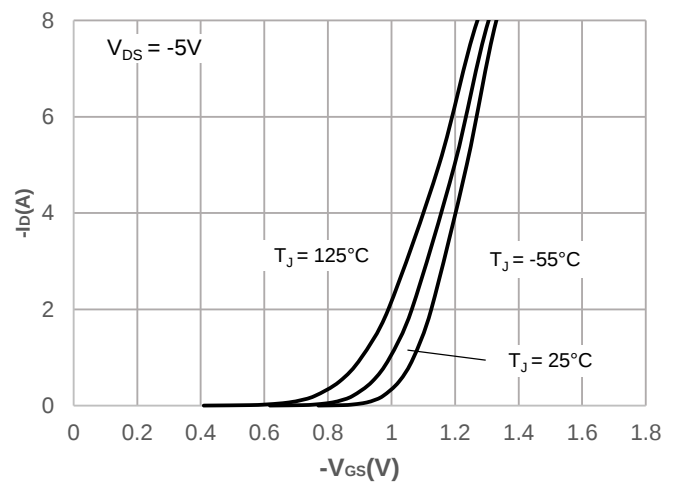


Figure 7: On-resistance vs. Drain Current

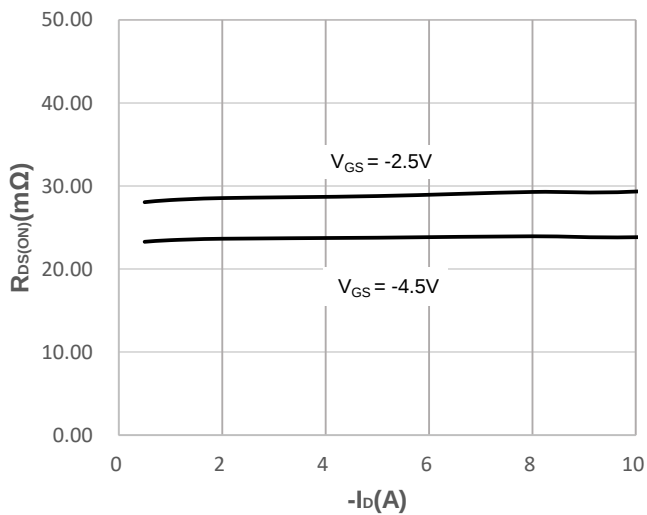


Figure 8: Body Diode Characteristics

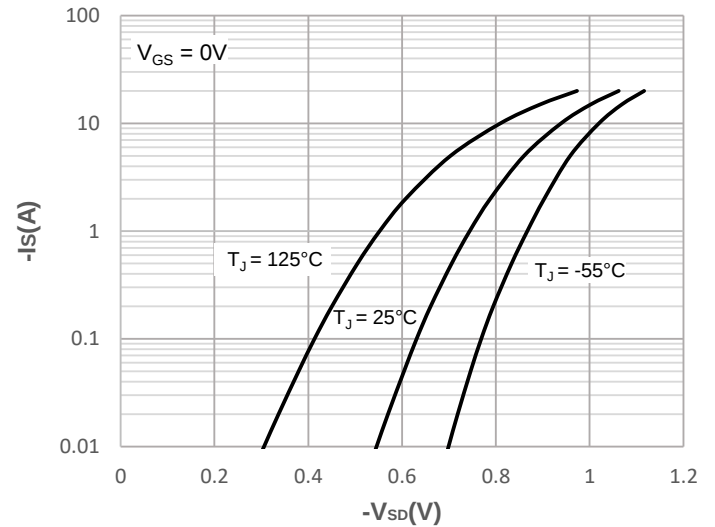


Figure 9: Gate Charge Characteristics

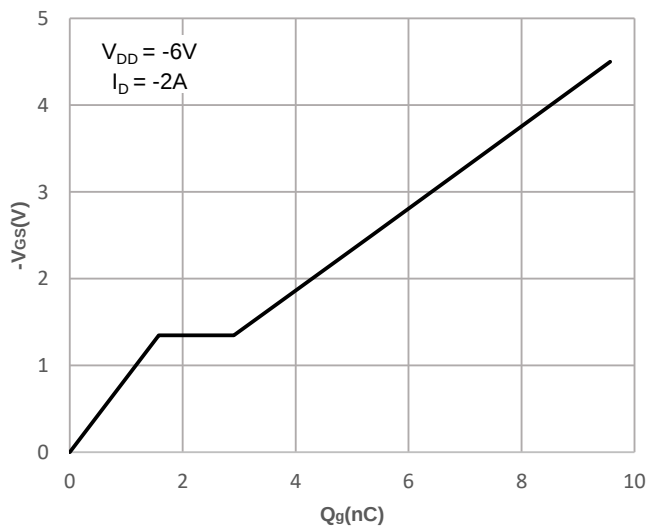
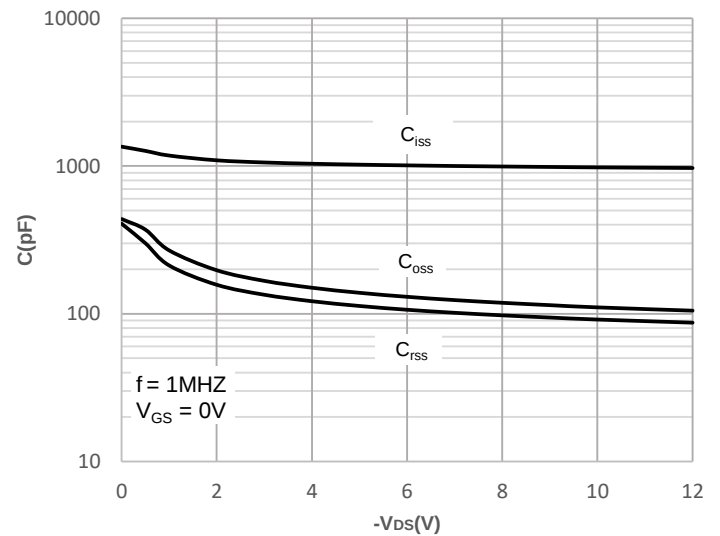


Figure 10: Capacitance Characteristics



Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

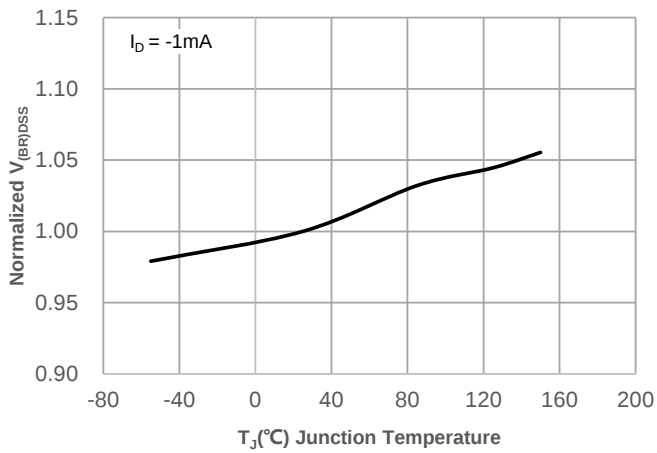


Figure 12: Normalized on Resistance vs. Junction Temperature

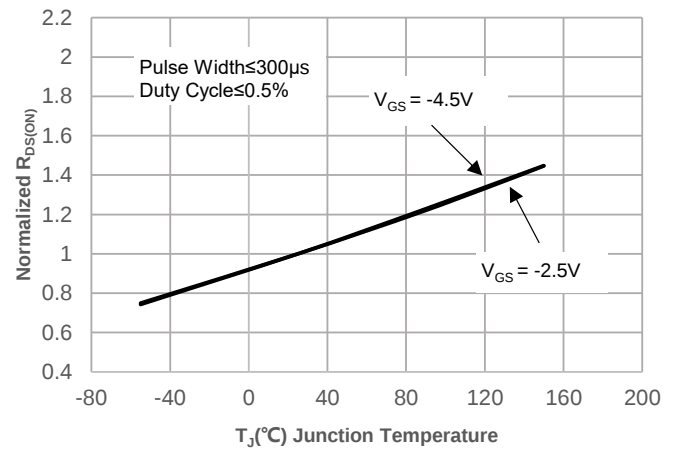


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

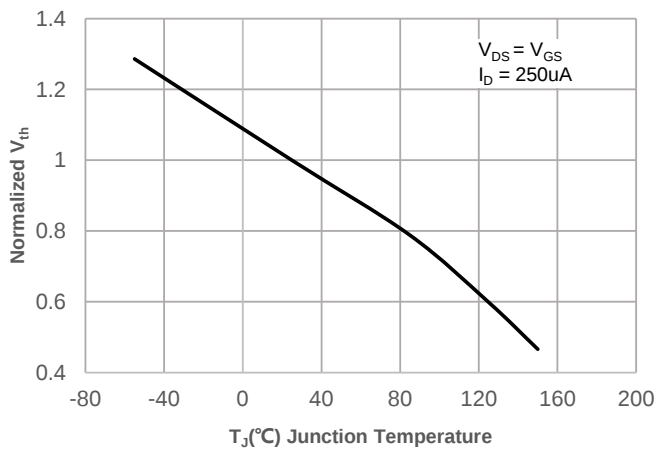


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

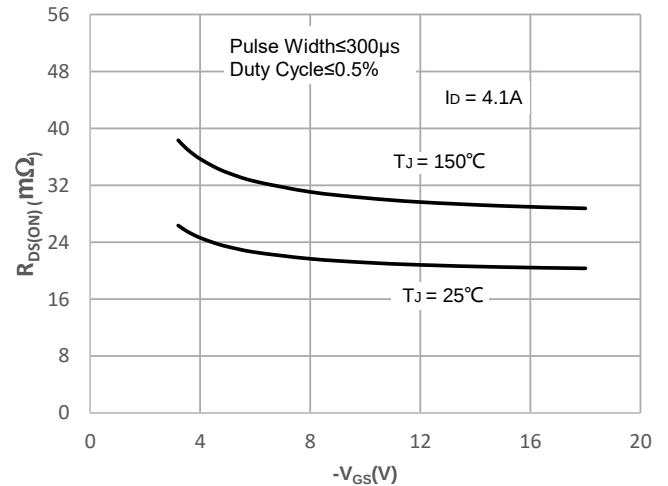
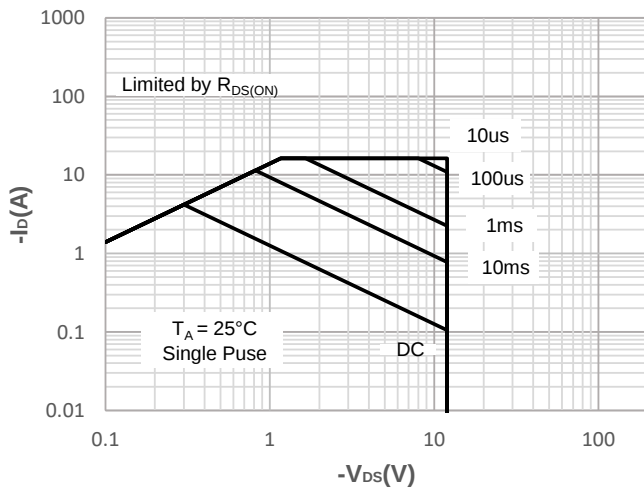


Figure 15: Maximum Safe Operating Area



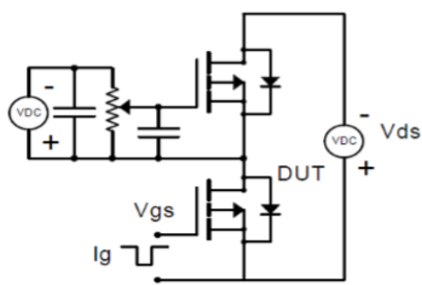


Figure 1: Gate Charge Test Circuit & Waveform

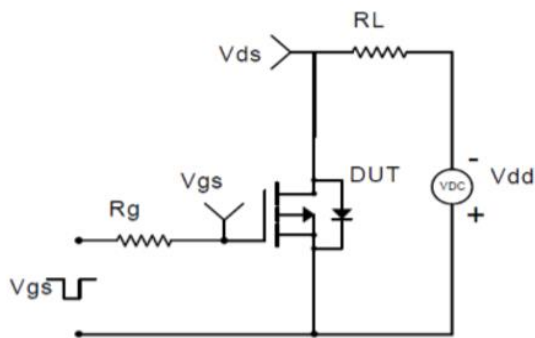


Figure 2: Resistive Switching Test Circuit & Waveform

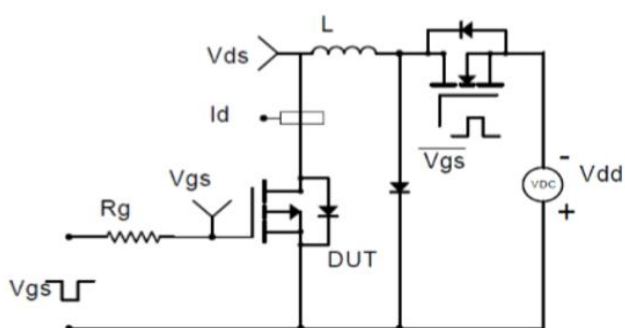


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

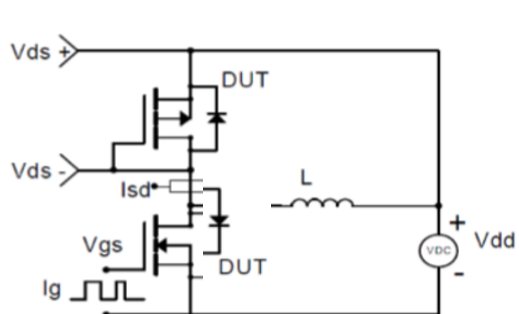
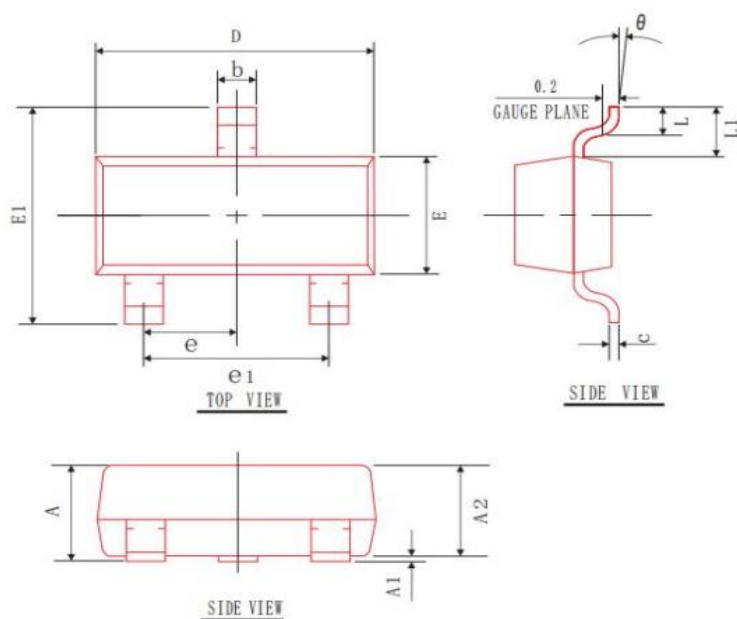


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOT-23-3L)



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		