

N-Channel MOSFET

Features

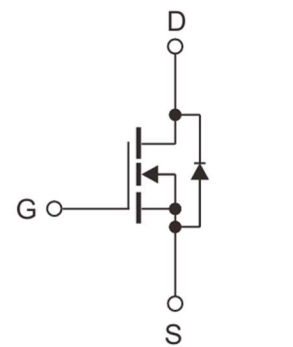
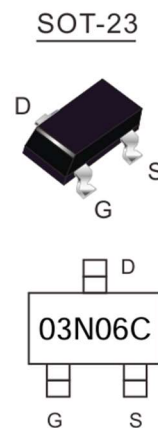
- Trench Power LV MOSFET technology
- High Speed switching
- Halogen-Free & Lead-Free

Product Summary		
V_{DS}	$R_{DS(on)}$ (m Ω) Typ	I_D (A)
60V	60@ 10V	3
	70 @ 4.5V	2

Application

- Load Switch for Portable Devices
- DC/DC Converter

Marking information



N-channel MOSFET

Absolute Maximum Ratings (at $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous drain current ($T_A=25^\circ\text{C}$)	I_D	3	A
Continuous drain current ($T_A=70^\circ\text{C}$)	I_D	1.9	A
Pulsed Drain Current ¹⁾	I_{DM}	20	A
Power Dissipation	P_D	1.2	W
Operating Junction	T_J	-55~150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient ²⁾	$R_{\theta JA}$	105	$^\circ\text{C/W}$

Note:

1. Pulse Test: Pulse Width \leq 300us, Duty cycle \leq 2%.
2. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Characteristics at $T_J = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	60			V
Drain-Source Leakage Current at $V_{DS}=60V, V_{GS}=0V$	I_{DSS}			1	μA
Gate Leakage Current at $V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}			± 0.1	μA
Gate-Source Threshold Voltage at $V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	0.9	1.3	2	V
Drain-Source On-State Resistance at $V_{GS}=10V, I_D=3A$ at $V_{GS}=4.5V, I_D=2A$	$R_{DS(on)}$		60 70	80 95	$m\Omega$
DYNAMIC PARAMETERS					
Input Capacitance at $V_{DS}=30V, V_{GS}=0V, f=1MHz$	C_{iss}		400		pF
Output Capacitance at $V_{DS}=30V, V_{GS}=0V, f=1MHz$	C_{oss}		28		pF
Reverse Transfer Capacitance at $V_{DS}=30V, V_{GS}=0V, f=1MHz$	C_{rss}		23		pF
Gate charge total at $V_{DS}=30V, V_{GS}=10V, I_D=3A$	Q_g		8.8		nC
Gate to Source Charge at $V_{DS}=30V, V_{GS}=10V, I_D=3A$	Q_{gs}		1.0		nC
Gate to Drain Charge at $V_{DS}=30V, V_{GS}=10V, I_D=3A$	Q_{gd}		2.5		nC
Turn-On Delay Time at $V_{DD}=30V, I_D=3A, R_{GEN}=2.3\Omega, V_{GS}=10V$	$t_{d(on)}$		4.5		nS
Turn-On Rise Time at $V_{DD}=30V, I_D=3A, R_{GEN}=2.3\Omega, V_{GS}=10V$	t_r		10		nS
Turn-Off Delay Time at $V_{DD}=30V, I_D=3A, R_{GEN}=2.3\Omega, V_{GS}=10V$	$t_{d(off)}$		12.5		nS
Turn-Off Fall Time at $V_{DD}=30V, I_D=3A, R_{GEN}=2.3\Omega, V_{GS}=10V$	t_f		1.5		nS
Reverse Recovery Time $I_F=3A, di/dt=500A/\mu s$	t_{rr}		12		nS
Reverse Recovery Charge $I_F=3A, di/dt=500A/\mu s$	Q_{rr}		24		nC
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S=3A, V_{GS}=0V$	V_{SD}			1.2	V
Maximum Body-Diode Continuous Current	I_S			3	A

Electrical Characteristics Curves

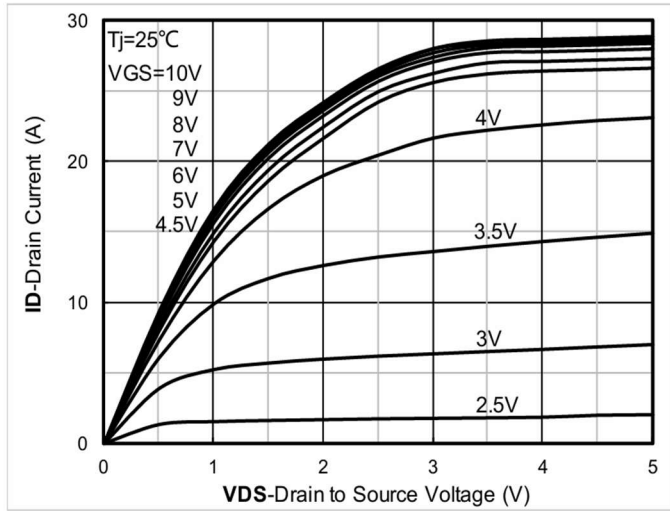


Figure 1. Output Characteristics

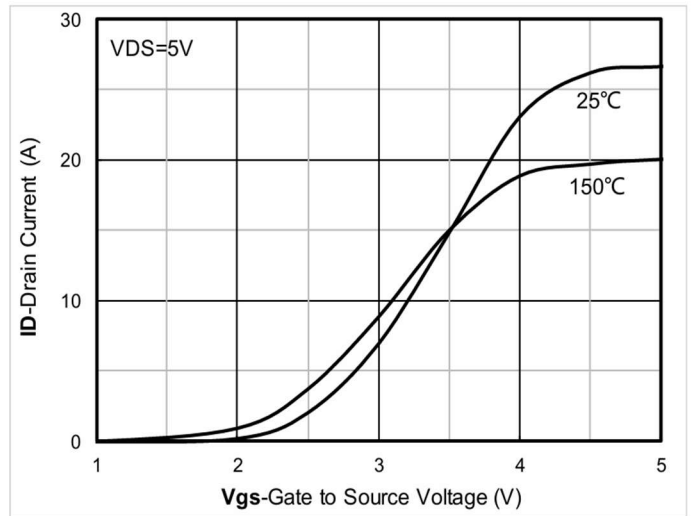


Figure 2. Transfer Characteristics

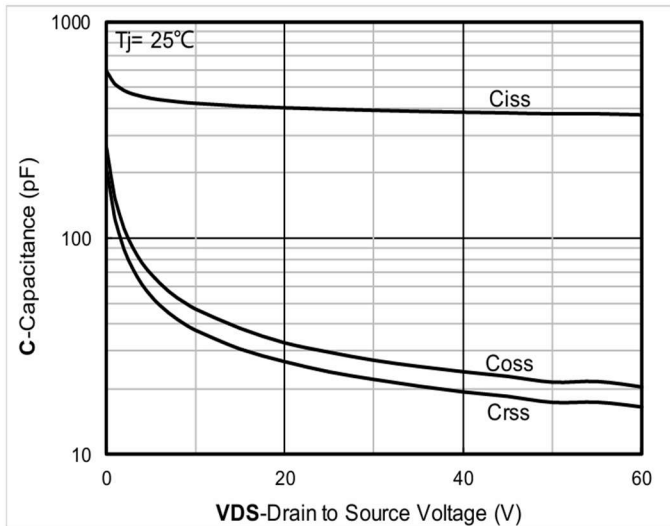


Figure 3. Capacitance Characteristics

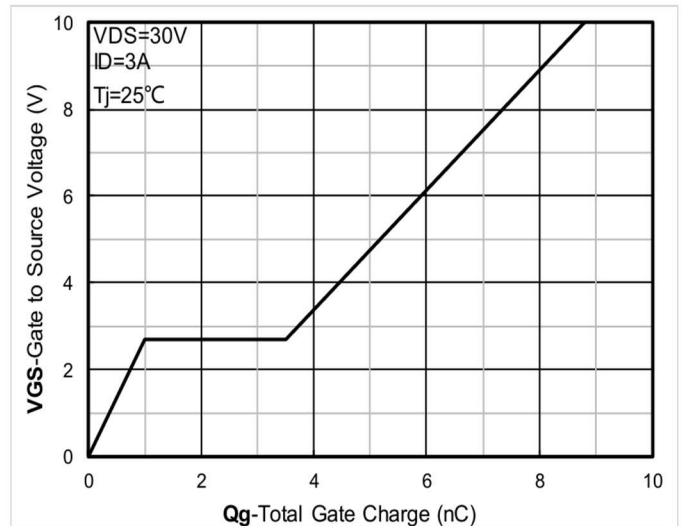


Figure 4. Gate Charge

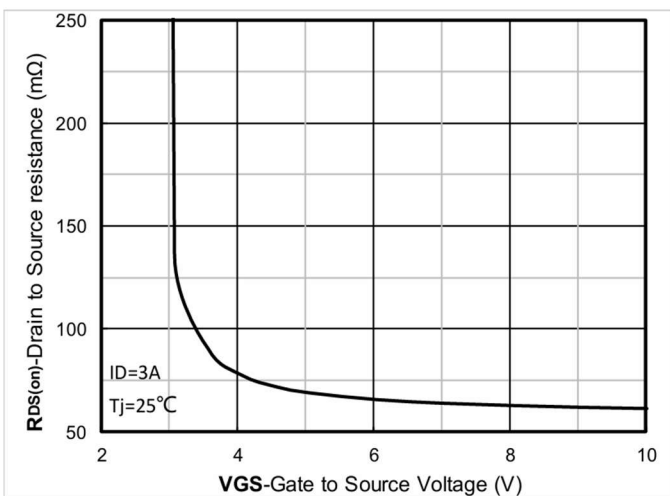


Figure 5. On-Resistance vs Gate to Source Voltage

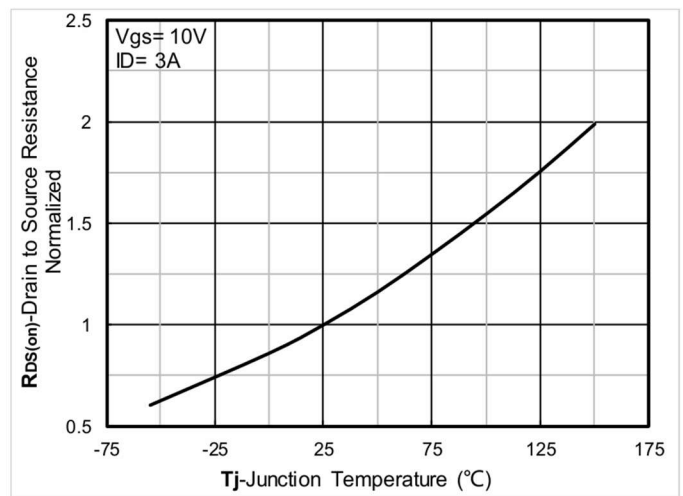


Figure 6. Normalized On-Resistance

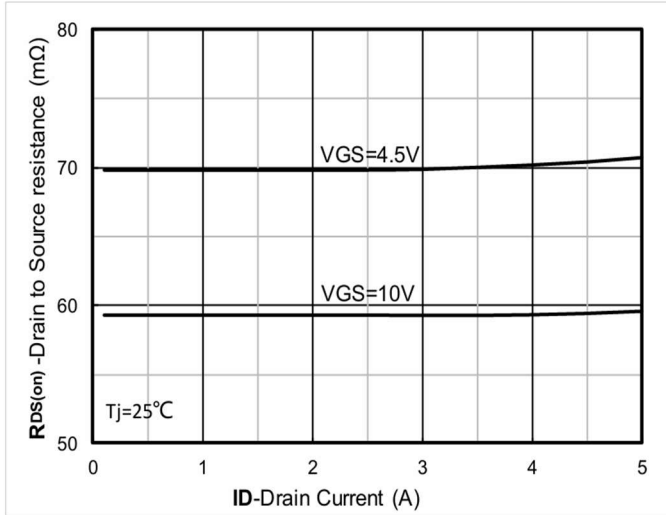


Figure 7. RDS(on) VS Drain Current

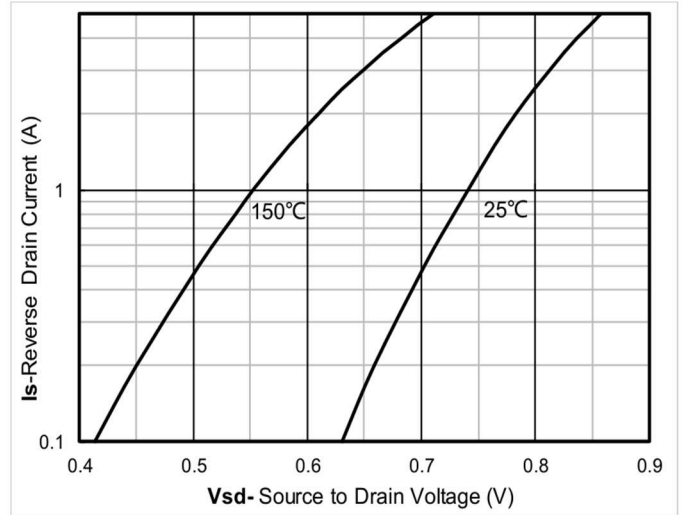


Figure 8. Forward characteristics of reverse diode

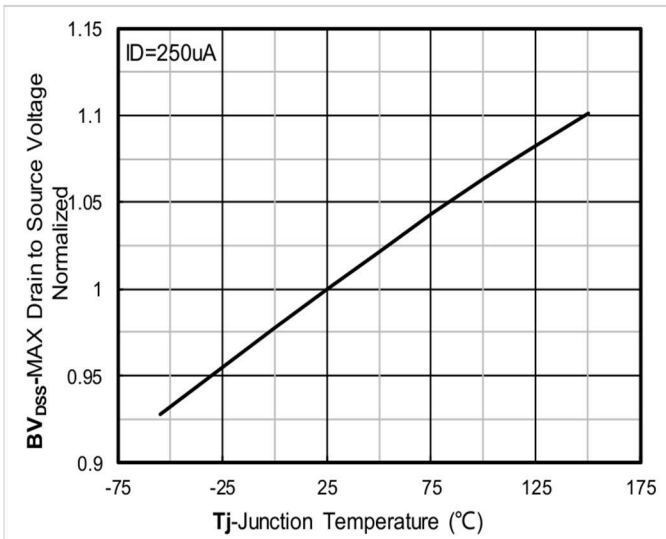


Figure 9. Normalized breakdown voltage

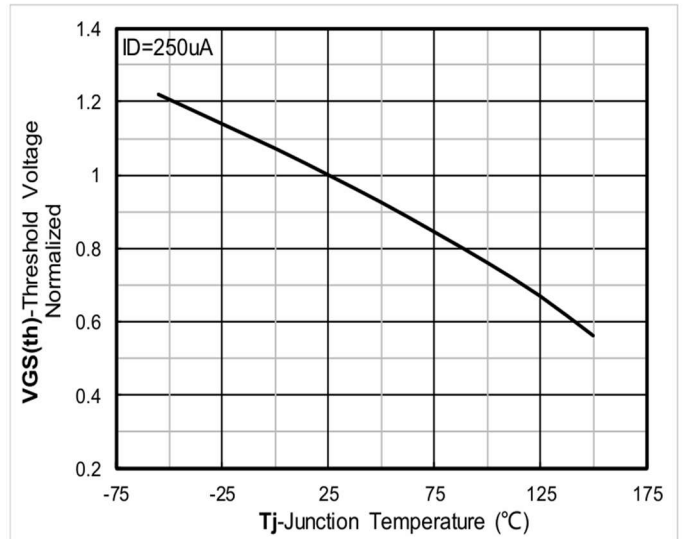


Figure 10. Normalized Threshold voltage

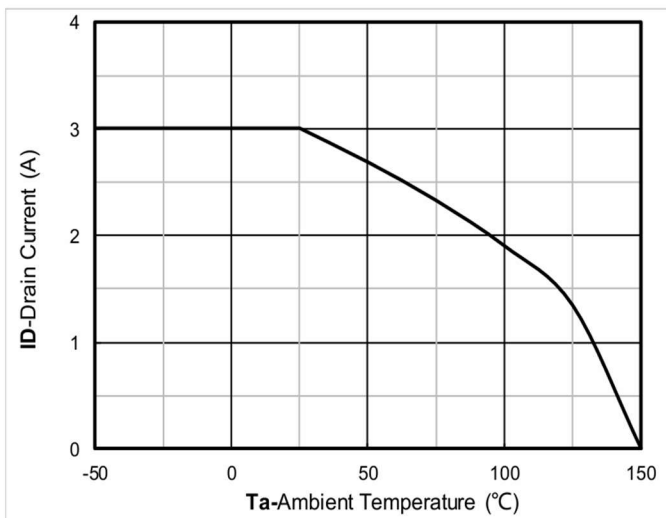


Figure 11. Current dissipation

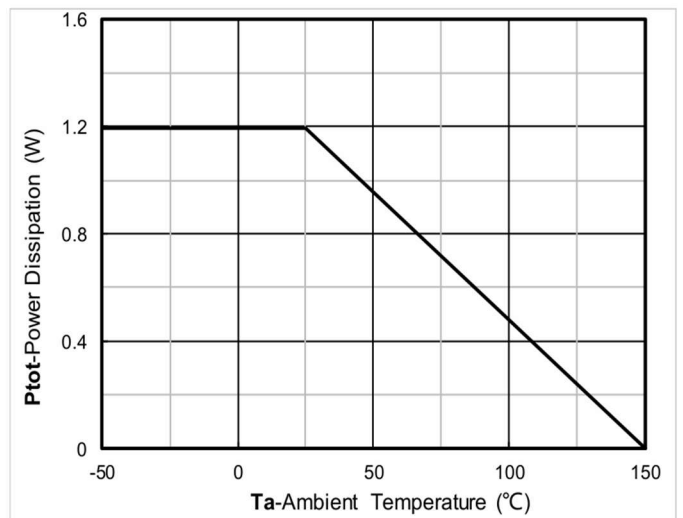


Figure 12. Power dissipation

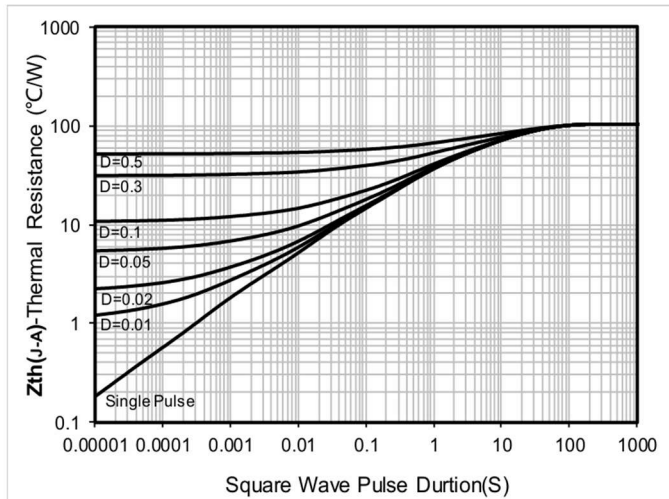


Figure 13. Maximum Transient Thermal Impedance

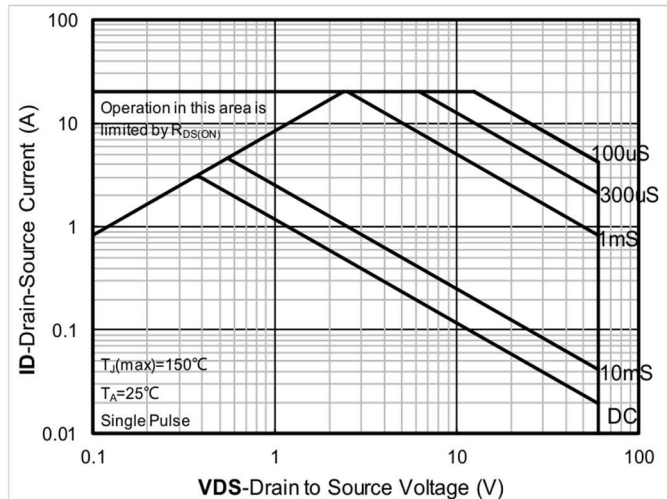


Figure 14. Safe Operation Area

Test Circuits & Waveforms

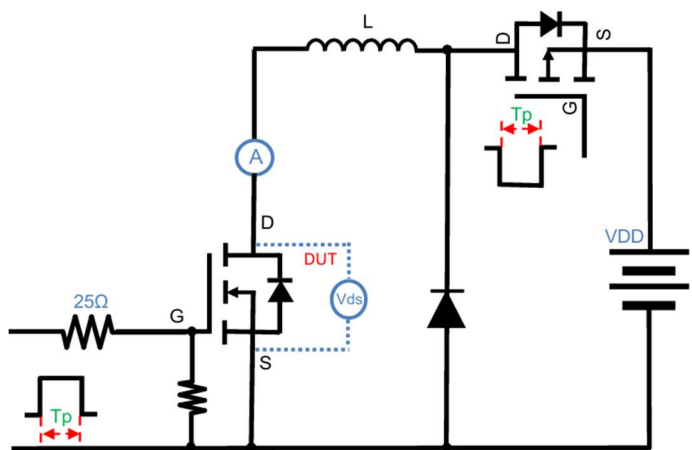


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

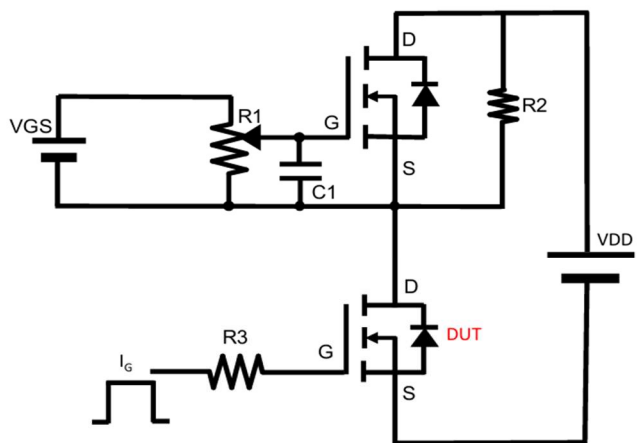


Figure B. Gate Charge Test Circuit & Waveform

Test Circuits & Waveforms

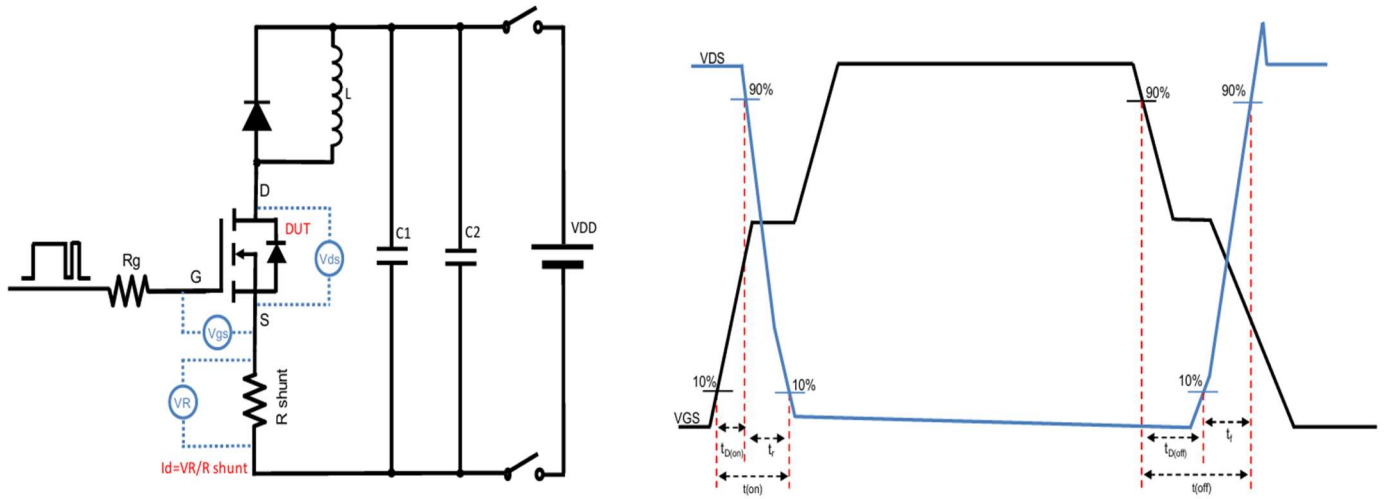


Figure C. Resistive Switching Test Circuit & Waveform

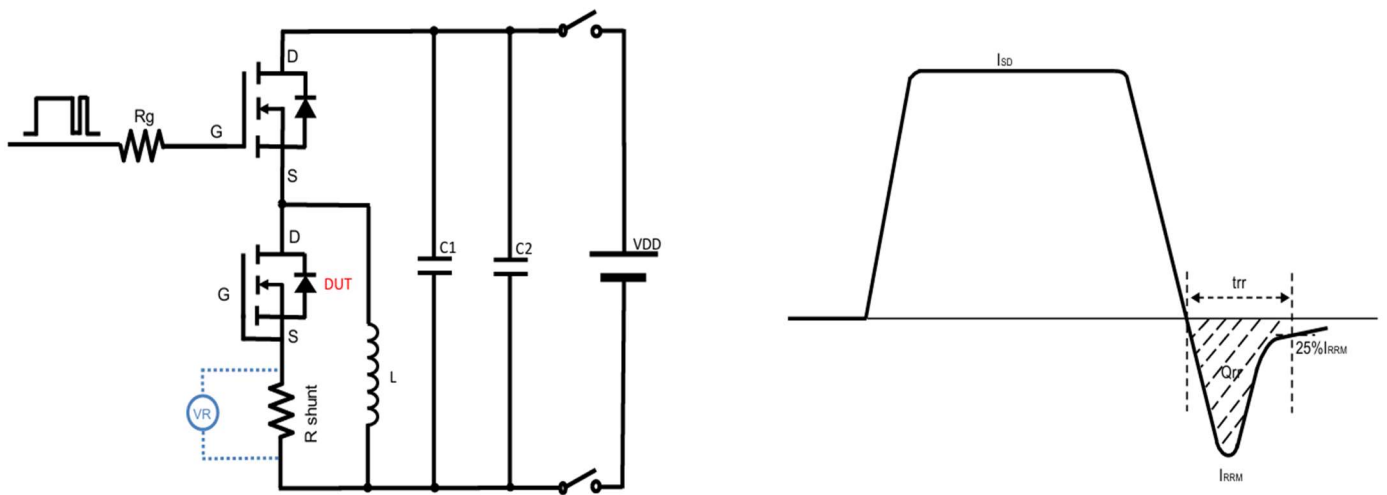
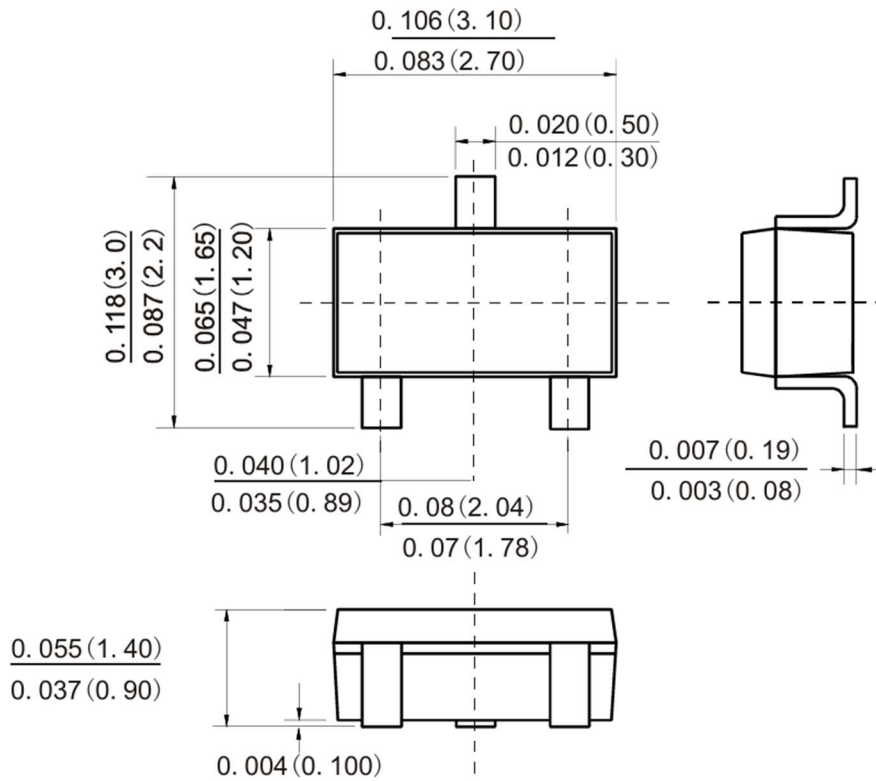


Figure D. Diode Recovery Test Circuit & Waveform

Order Information

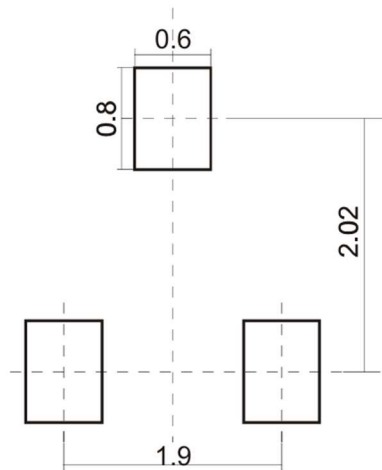
Part Number	Package	Quantity
Sh03N06C	SOT-23	3000

Package Outline Dimensions (Units: mm) SOT-23



Dimensions in inches and (millimeters)

Suggested Pad Layout



Dimensions in millimeters