

N-Channel Enhancement MOSFET

Features

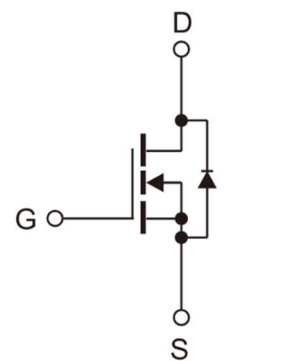
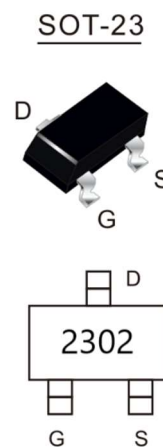
- Trench Power LV MOSFET technology
- Voltage Controlled Small Signal Switch
- Halogen-Free & Lead-Free

Product Summary			
V_{DS}	$R_{DS(on)}$ (m Ω) Typ	I_D (A)	Q_g (Typ)
20V	29 @ 2.5V	4.3	6.6nc
	21 @ 4.5V		

Application

- Load Switch for Portable Devices
- Solid-state relays
- 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}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous drain current ($T_A=25^\circ\text{C}$)	I_D	4.3	A
Continuous drain current ($T_A=70^\circ\text{C}$)	I_D	3.5	A
Power Dissipation	P_D	1.0	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 ¹⁾	$R_{\theta JA}$	125	$^\circ\text{C/W}$

Note:

1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Characteristics at T_J = 25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at V _{GS} =0V, I _D =250μA	BV _{DSS}	20			V
Drain-Source Leakage Current at V _{DS} =20V, V _{GS} =0V	I _{DSS}			1	μA
Gate Leakage Current at V _{GS} =±10V, V _{DS} =0V	I _{GSS}			±0.1	μA
Gate-Source Threshold Voltage at V _{DS} =V _{GS} , I _D =250μA	V _{GS(th)}	0.55	0.85	1.25	V
Drain-Source On-State Resistance at V _{GS} =4.5V, I _D =4.3A at V _{GS} =2.5V, I _D =3.0A	R _{DS(on)}		21 29	27 37	mΩ
DYNAMIC PARAMETERS					
Input Capacitance at V _{DS} =10V, V _{GS} =0V, f=1MHz	C _{iss}		595		pF
Output Capacitance at V _{DS} =10V, V _{GS} =0V, f=1MHz	C _{oss}		106		pF
Reverse Transfer Capacitance at V _{DS} =10V, V _{GS} =0V, f=1MHz	C _{rss}		59		pF
Gate charge total at V _{DS} =10V, V _{GS} =4.5V, I _D =4.3A	Q _g		6.6		nC
Gate to Source Charge at V _{DS} =10V, V _{GS} =4.5V, I _D =4.3A	Q _{gs}		0.9		nC
Gate to Drain Charge at V _{DS} =10V, V _{GS} =4.5V, I _D =4.3A	Q _{gd}		1.4		nC
Turn-On Delay Time at V _{DD} =10V, R _L =1.5Ω, R _{GEN} =3Ω, V _{GS} =4.5V	t _{d(on)}		13		nS
Turn-On Rise Time at V _{DD} =10V, R _L =1.5Ω, R _{GEN} =3Ω, V _{GS} =4.5V	t _r		54		ns
Turn-Off Delay Time at V _{DD} =10V, R _L =1.5Ω, R _{GEN} =3Ω, V _{GS} =4.5V	t _{d(off)}		18		nS
Turn-On Fall Time at V _{DD} =10V, R _L =1.5Ω, R _{GEN} =3Ω, V _{GS} =4.5V	t _f		11		ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I _S =4.3A, V _{GS} =0V	V _{SD}			1.2	V
Maximum Body-Diode Continuous Current	I _S			4.3	A

Electrical Characteristics Curves

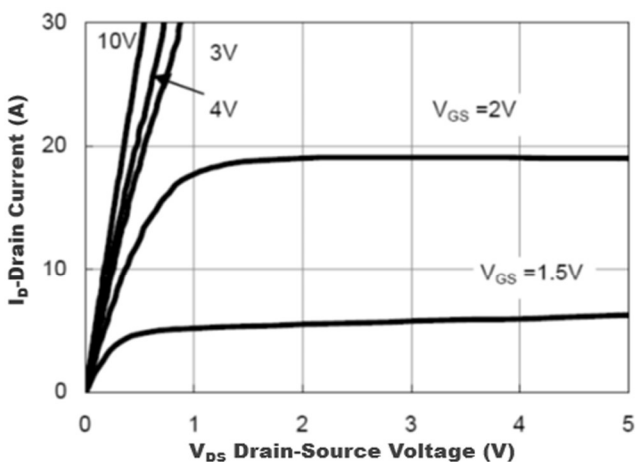


Figure1. Output Characteristics

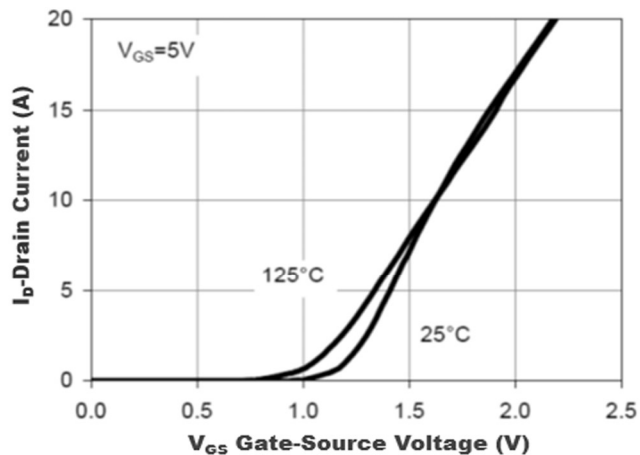


Figure2. Transfer Characteristics

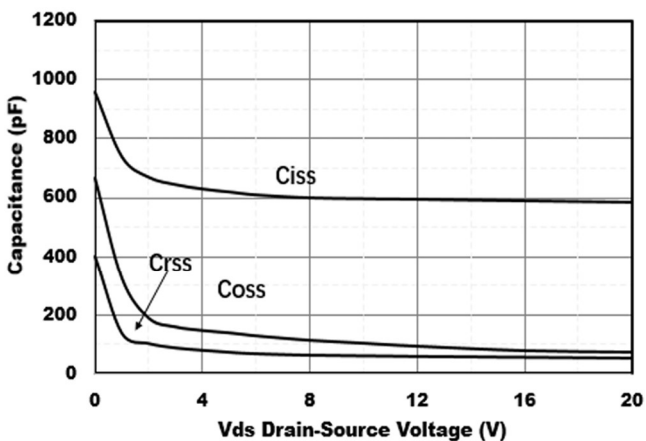


Figure3. Capacitance Characteristics

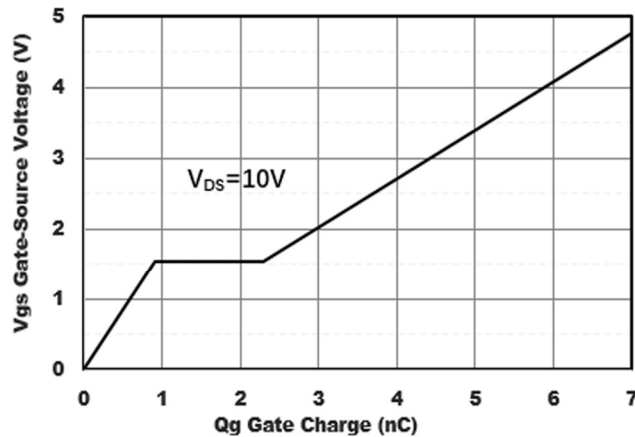


Figure4. Gate Charge

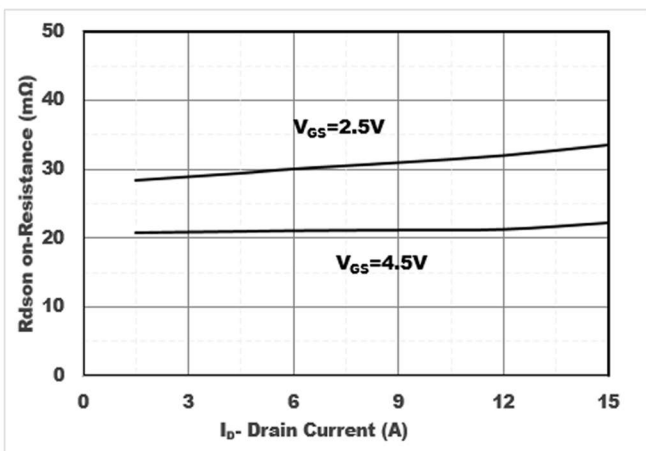


Figure5. Drain-Source on Resistance

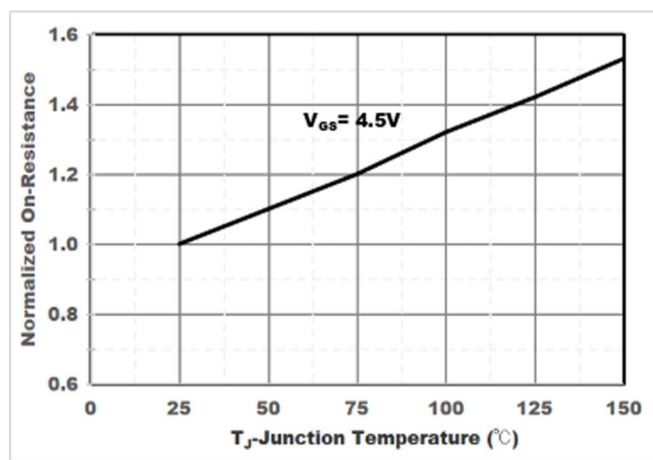


Figure6. Drain-Source on Resistance

Electrical Characteristics Curves

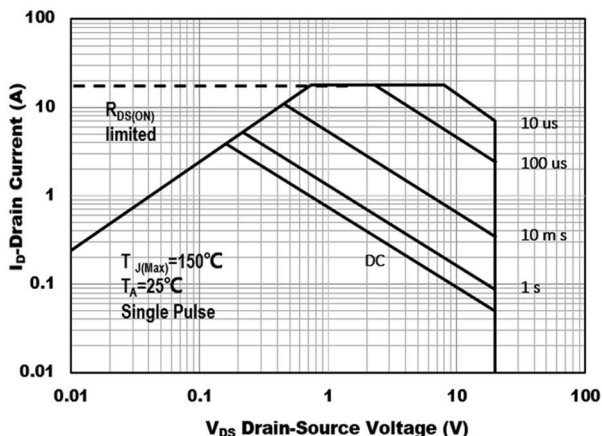


Figure7. Safe Operation Area

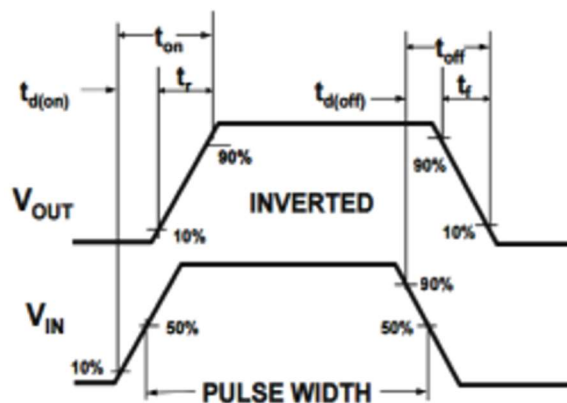
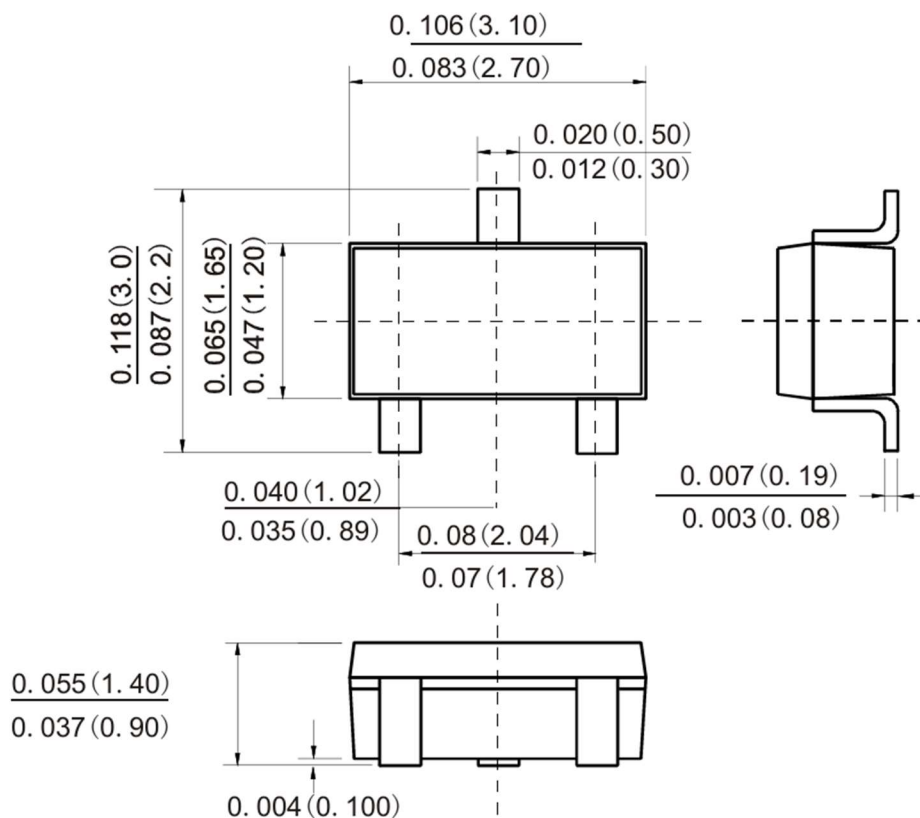


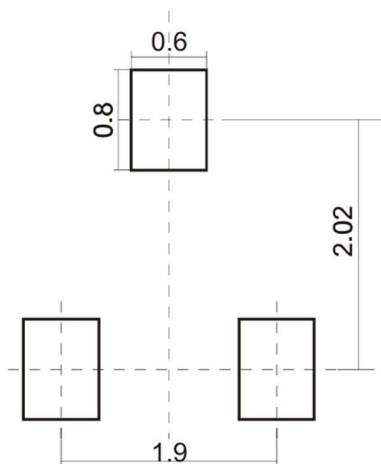
Figure8. Switching wave

Package Outline Dimensions (Units: mm) SOT-23



Dimensions in inches and (millimeters)

Suggested Pad Layout



Dimensions in millimeters

Order Information

Part Number	Package	Quantity
Sh2302A	SOT-23	3000