P-Channel Enhancement MOSFET

Features

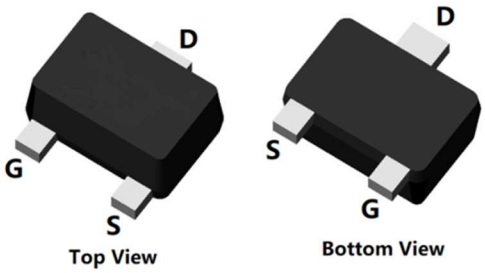
- Trench Power MV MOSFET technology
- Extremely low switching loss
- Excellent stability and uniformity
- Halogen-Free & Lead-Free
- ESD Protected up to 2KV (HBM)

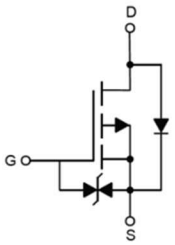
Product Summary		
V_{DS}	$R_{DS(on)}$ (Ω) Typ	I_D (A)
-20V	0.65@ -4.5V -0.5A	-0.5
	0.9@ -2.5V -0.3A	

Application

- Load Switch for Portable Devices
- Voltage controlled small signal switch

SOT-723





Absolute Maximum Ratings (at T_A = 25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±10	V
Continuous Drain Current	T_A = 25℃	I_D	-0.5	A
	T_A = 70℃	I_D	-0.3	A
Peak Drain Current, Pulsed [1]		I_{DM}	-2.5	A
Power Dissipation	T_A = 25°C	P_D	0.28	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient [2]	$R_{\theta JA}$	450	°C/W

Note:

1) Pulse width ≤300us, duty cycle ≤2%, limited by Tj max.

2) 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}			±10	μA
Gate-Source Threshold Voltage at V_{DS}=V_{GS}, I_D=-250μA	$V_{GS(th)}$	-0.35	-0.7	-1.1	V
Drain-Source On-State Resistance at V_{GS} = -4.5V, I_D = -0.5A at V_{GS} = -2.5V, I_D = -0.3A at V_{GS} = -1.8V, I_D = -0.2A	$R_{DS(on)}$		0.65 0.9 1.4	0.85 1.2 2	Ω
DYNAMIC PARAMETERS					
Input Capacitance at V_{GS}=0V, V_{DS}=-10V, f=1MHz	C_{iss}		40		pF
Output Capacitance at V_{GS}=0V, V_{DS}=-10V, f=1MHz	C_{oss}		15		
Reverse Transfer Capacitance at V_{GS}=0V, V_{DS}=-10V, f=1MHz	C_{rss}		10		
Gate charge total at V_{DS}=-10V, V_{GS}=-4.5V, I_D=-0.5A	Q_g		1.24		nC
Gate to Source Charge at V_{DS}=-10V, V_{GS}=-4.5V, I_D=-0.5A	Q_{gs}		0.37		
Gate to Drain Charge at V_{DS}=-10V, V_{GS}=-4.5V, I_D=-0.5A	Q_{gd}		0.27		
Turn-On Delay Time at V_{DD}=-10V, V_{GS}=-4.5V, R_{GEN}=3Ω, I_D=-0.5A	$t_{d(on)}$		4		nS
Turn-On Rise Time at V_{DD}=-10V, V_{GS}=-4.5V, R_{GEN}=3Ω, I_D=-0.5A	t_r		19		
Turn-Off Delay Time at V_{DD}=-10V, V_{GS}=-4.5V, R_{GEN}=3Ω, I_D=-0.5A	$t_{d(off)}$		16		
Turn-Off Fall Time at V_{DD}=-10V, V_{GS}=-4.5V, R_{GEN}=3Ω, I_D=-0.5A	t_f		25		
Reverse Recovery Time at I_S=-0.5A, di/dt=100A/μs	trr		26		nS
Reverse Recovery Charge at I_S=-0.5A, di/dt=100A/μs	Qrr		0.97		nC
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I_S=-0.5A, V_{GS}=0V	V_{SD}			-1.2	V
Maximum Body-Diode Continuous Current	I_S			-0.5	A

Electrical Characteristics Curves

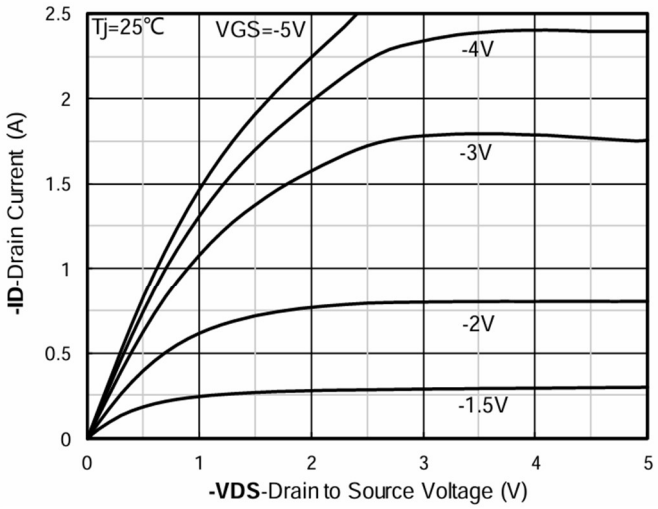


Figure 1. Output Characteristics

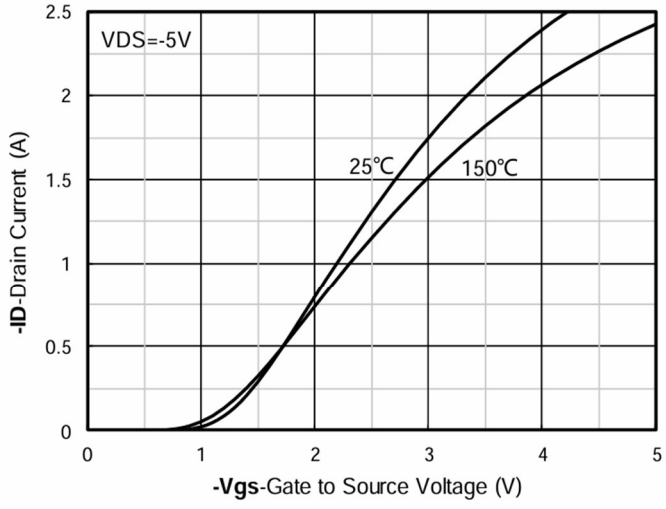


Figure 2. Transfer Characteristics

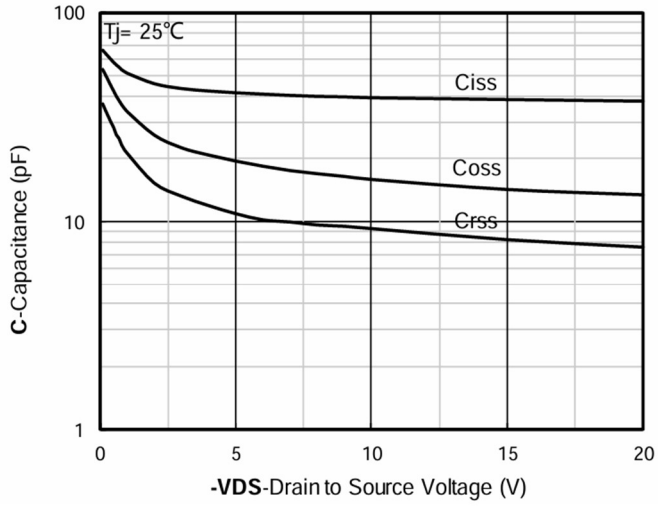


Figure 3. Capacitance Characteristics

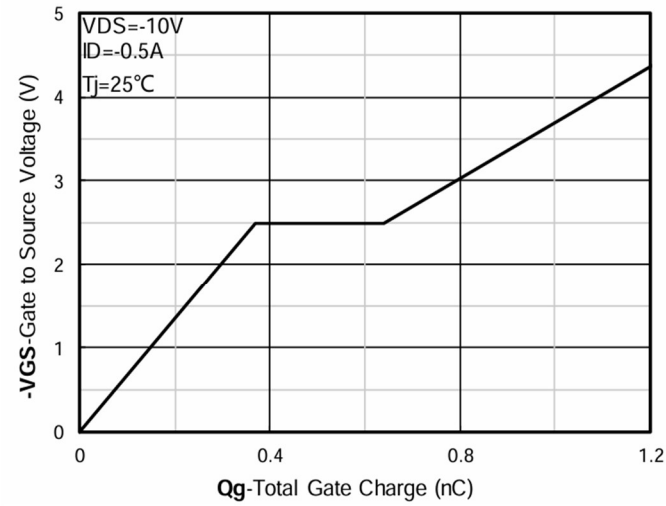


Figure 4. Gate Charge

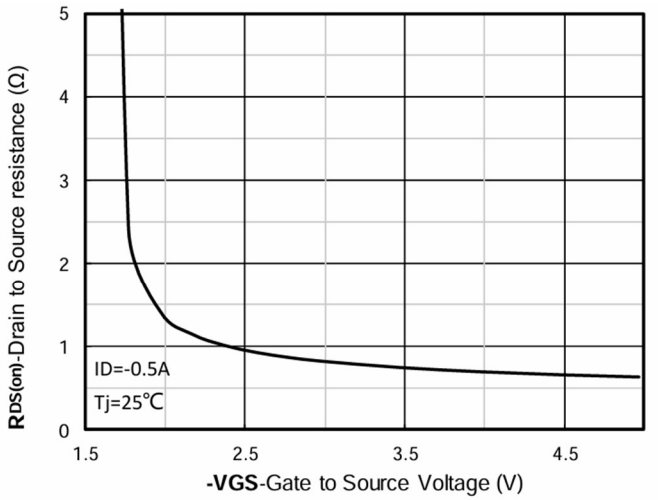


Figure 5. On-Resistance vs Gate to Source Voltage

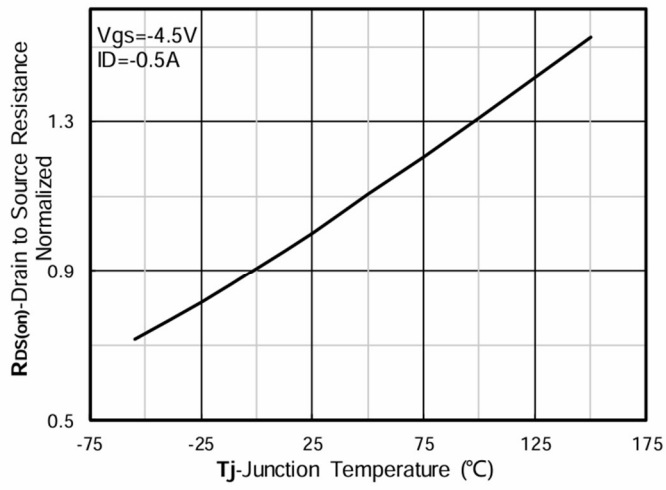
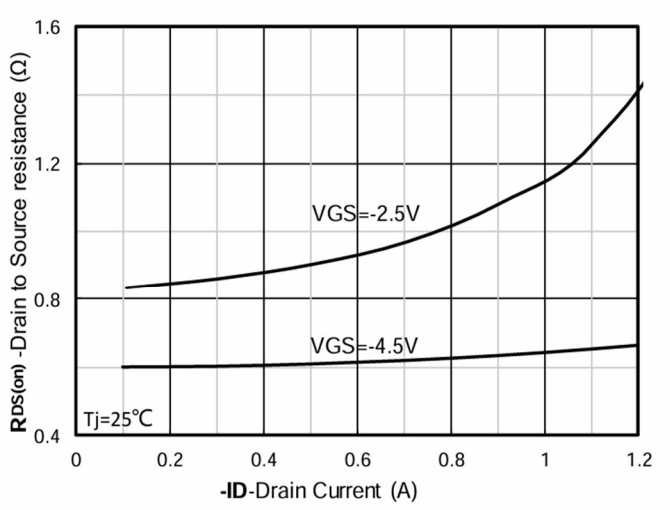
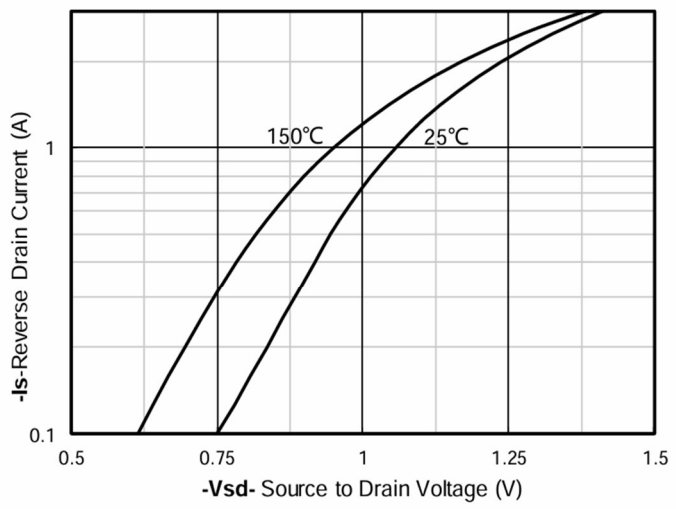


Figure 6. Normalized On-Resistance

Electrical Characteristics Curves



7. RDS(on) VS Drain Current



8. Forward characteristics of reverse diode

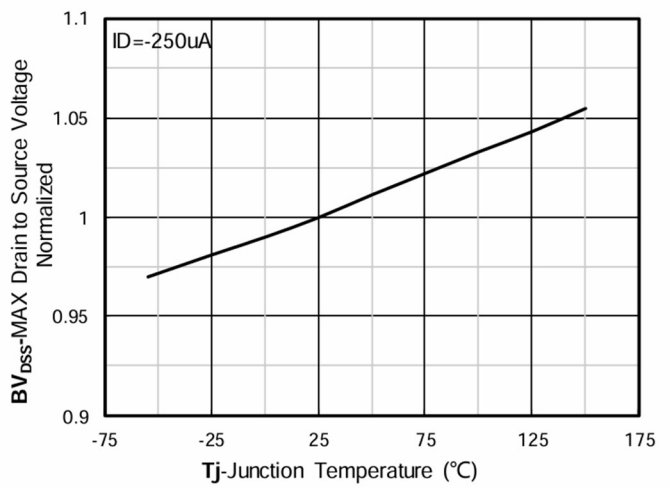


Figure 9. Normalized breakdown voltage

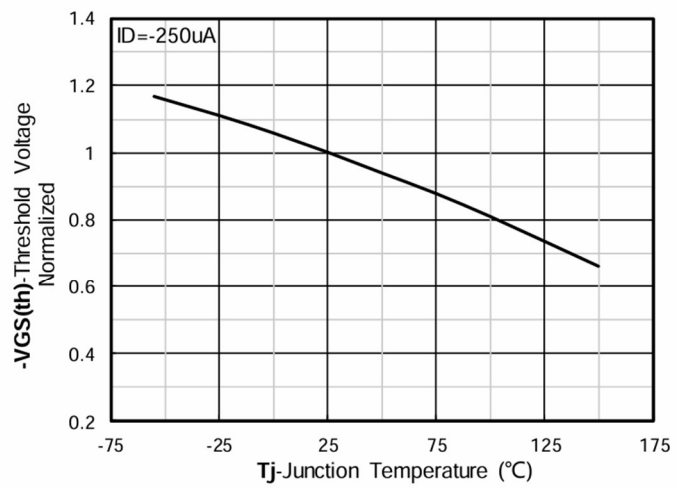


Figure 10. Normalized Threshold voltage

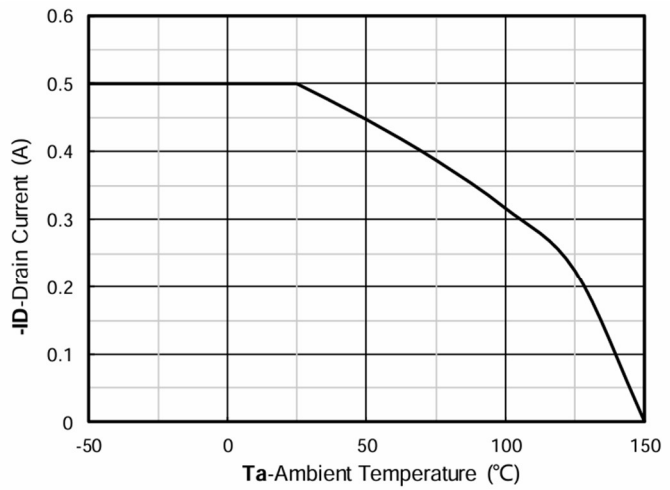


Figure 11. Current dissipation

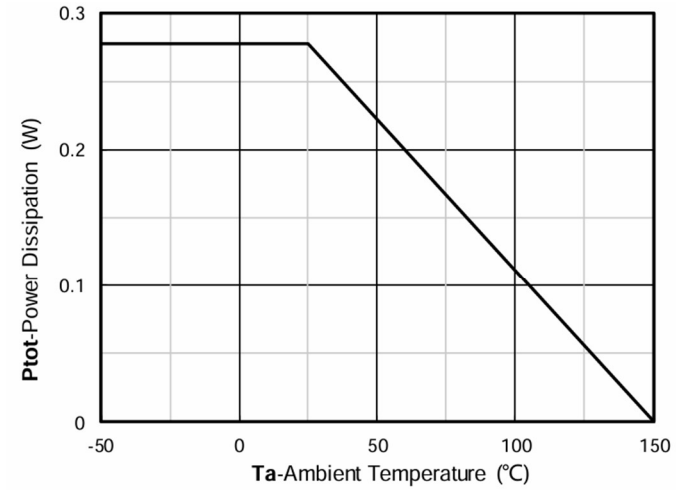


Figure 12. Power dissipation

Electrical Characteristics Curves

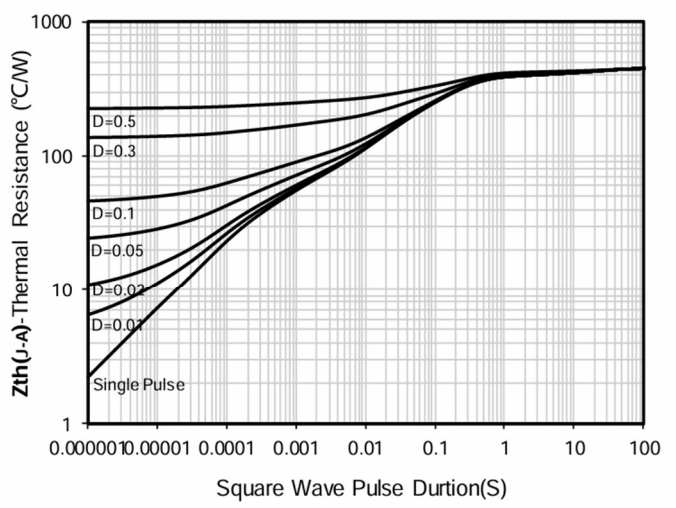


Figure 13. Maximum Transient Thermal Impedance

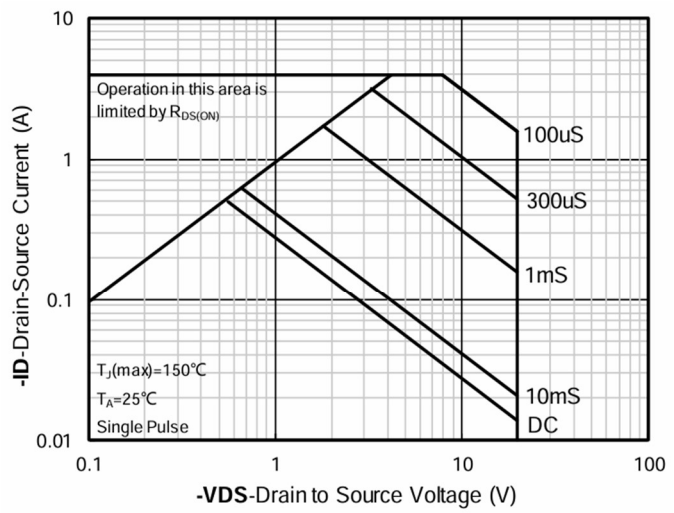
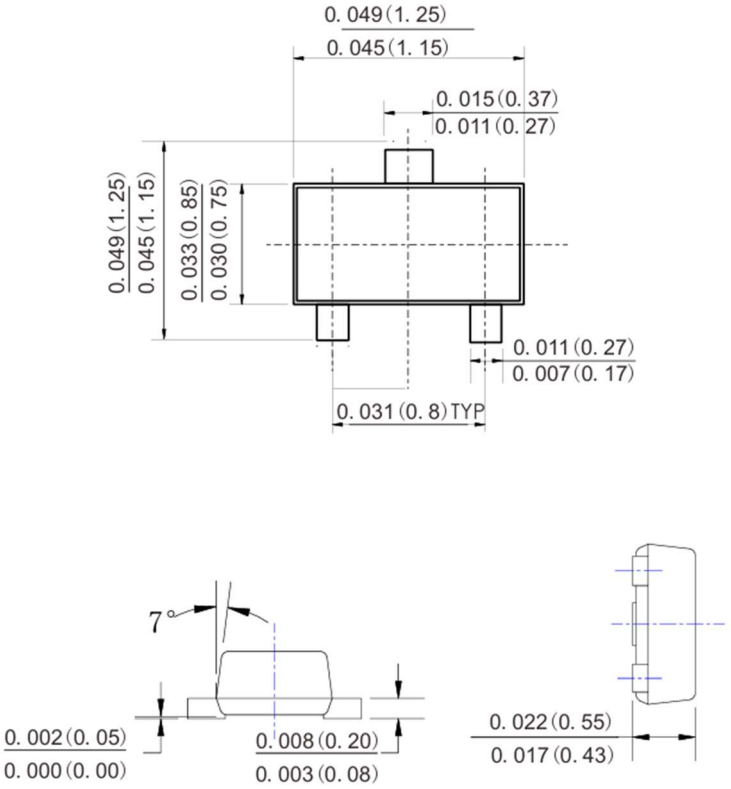


Figure 14. Safe Operation Area

Order Information

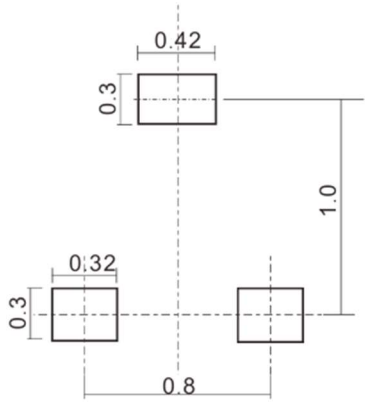
Part Number	Package	Marking	Quantity
Sh3139KAT	SOT-723	KA	3000

Package Outline Dimensions (Units: mm) SOT-723



Dimensions in inches and (millimetrers)

Suggested Pad Layout



Dimensions in millimetrers