晧科
SHIKUES

SK302P

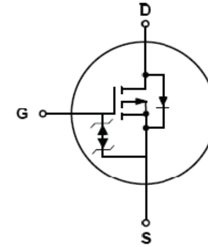
P-Channel Enhancement Mode MOSFET

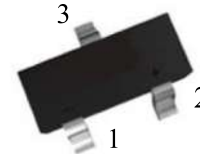
RDS(ON) ≦ 1.2 Ω @ VGS = - 4.5 V

RDS(ON) ≦ 1.5 Ω @ VGS = - 2.5 V

BV ≧ -20 V　P_{tot} ≦ 0.83 W　I_D ≦ -0.67 A

SOT-23





1：Gate　2：Source　3：Drain

Features

- Surface-mounted package
- Extremely low threshold voltage
- Advanced trench cell design
- ESD protected

Applications

- Portable appliances

Limiting Values

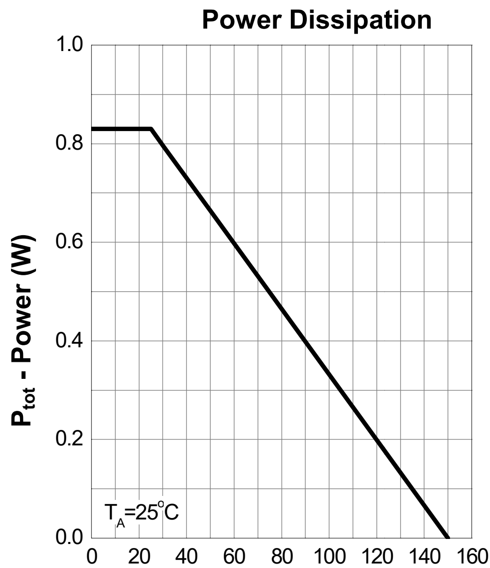
Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_A = 25 ℃	-	-20	V
V_{GS}	Gate-Source Voltage	T_A = 25 ℃	-	±10	V
I_D*	Drain Current	T_A = 25 ℃, V_{GS} = -4.5 V	-	-0.67	A
I_{DM}*,**	Pulsed Drain Current	T_A = 25 ℃, V_{GS} = -4.5 V	-	-2.6	A
P_{tot}*	Total Power Dissipation	T_A = 25 ℃	-	0.83	W
		T_A = 100 ℃	-	0.33	
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		-	150	℃
I_S*	Diode Forward Current	T_A = 25 ℃	-	-2.6	A
$R_{\theta JA}$*	Thermal Resistance- Junction to Ambient		-	150	℃ / W

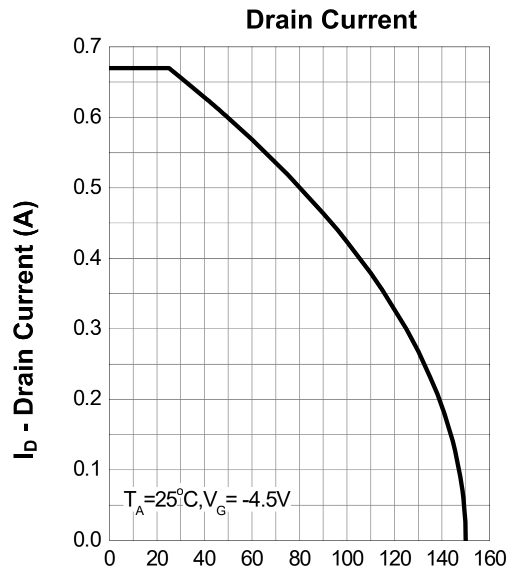
Notes：* Surface Mounted on 1 in^2 pad area, t ≤ 10 sec　　** Pulse width ≤ 300 μs, duty cycle ≤ 2 %

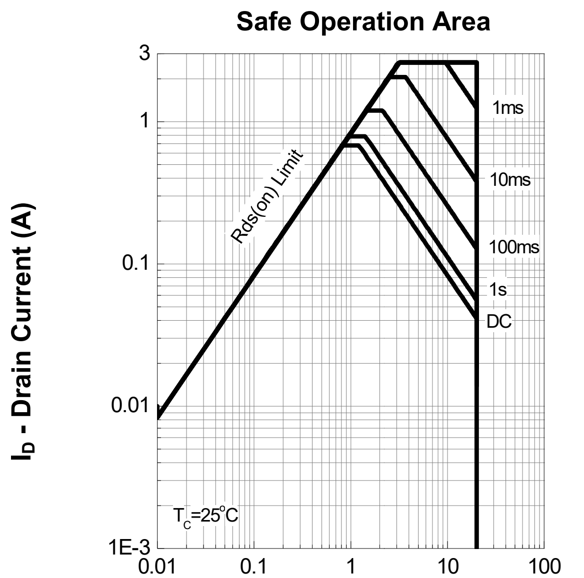
Electrical Characteristics (Ta = 25 °C Unless Otherwise Noted)

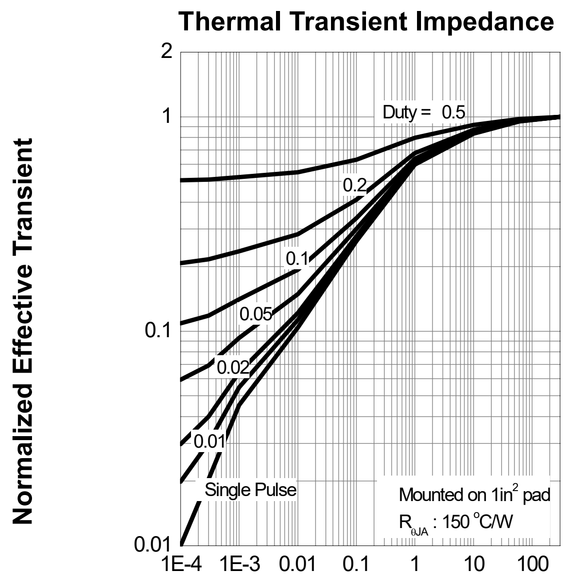
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static Characteristics							
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = -250 μA		-20	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = -250 μA		-0.3	-0.65	-1.0	V
I_{DSS}	Drain Leakage Current	V_{DS} = -20 V, V_{GS} = 0 V		-	-	-1	μA
			T_J = 85 ℃	-	-	-30	μA
I_{GSS}	Gate Leakage Current	V_{GS} = ± 8 V, V_{DS} = 0 V		-	-	± 10	μA
$R_{DS(ON)}$[a]	On-State Resistance	V_{GS} = -4.5 V, I_{DS} = -0.5 A		-	0.85	1.2	Ω
		V_{GS} = -2.5 V, I_{DS} = -0.2 A		-	1.05	1.5	
		V_{GS} = -1.5V , I_{DS} = -0.04A		-	1.5	-	
		V_{GS} = -1.2V , I_{DS} = -0.01A		-	2	-	
Diode Characteristics							
V_{SD}[a]	Diode Forward Voltage	I_{SD} = -0.5 A, V_{GS} = 0 V		-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_{SD} = -0.5 A, dI_{SD} / dt = 100 A / μs		-	70	-	ns
Q_{rr}	Reverse Recovery Charge			-	68	-	nC
Dynamic Characteristics[b]							
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = -10 V Frequency = 1 MHz		-	87	-	pF
C_{oss}	Output Capacitance			-	15	-	
C_{rss}	Reverse Transfer Capacitance			-	8.2	-	
t_d(on)	Turn-on Delay Time	V_{DS} = -30 V, V_{GEN} = -10 V, R_G = 25 Ω, R_L = 60 Ω, I_{DS} = -0.67 A		-	5.6	-	ns
t_r	Turn-on Rise Time			-	5.3	-	
t_d(off)	Turn-off Delay Time			-	30	-	
t_f	Turn-off Fall Time			-	21	-	
Q_g	Total Gate Charge	V_{GS} = -4.5 V, V_{DS} = -10 V, I_{DS} = -0.67 A		-	1.8	-	pC
Q_{gs}	Gate-Source Charge			-	0.82	-	
Q_{gd}	Gate-Drain Charge			-	0.59	-	

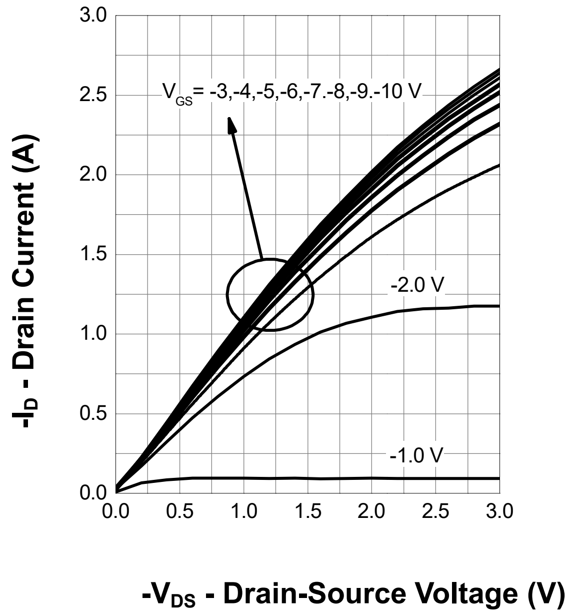
Notes：a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 % b : Guaranteed by design, not subject to production testing

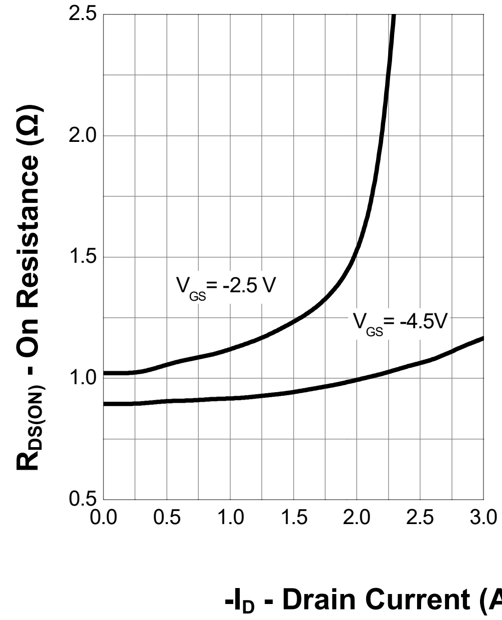

Power Dissipation
1.0
0.8
0.6
0.4
0.2
0.0
0 20 40 60 80 100 120 140 160
Ptot - Power (W)
TA=25°C
Tj - Junction Temperature (° C)

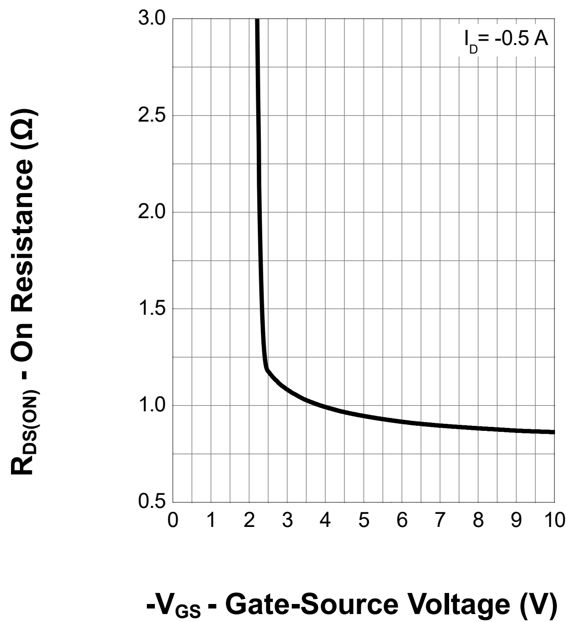

Drain Current
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0 20 40 60 80 100 120 140 160
ID - Drain Current (A)
TA=25°C,VG= -4.5V
Tj - Junction Temperature (° C)

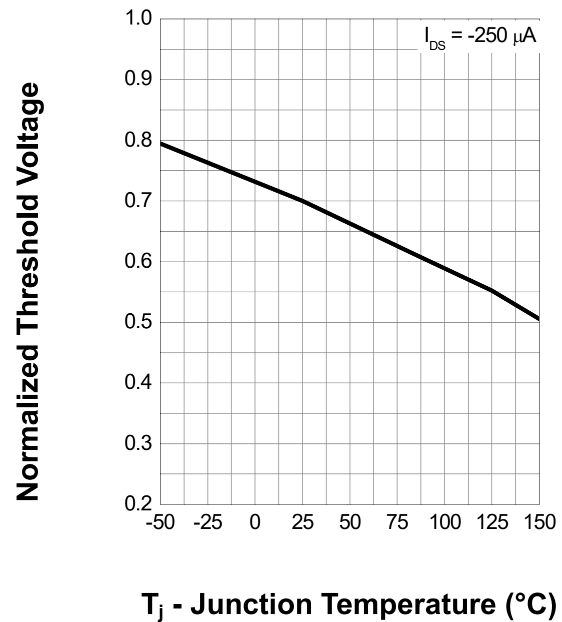

Safe Operation Area
3
1
0.1
0.01
1E-3
0.01 0.1 1 10 100
ID - Drain Current (A)
Rds(on) Limit
1ms
10ms
100ms
1s
DC
TC=25°C
-VDS - Drain-Source Voltage (V)

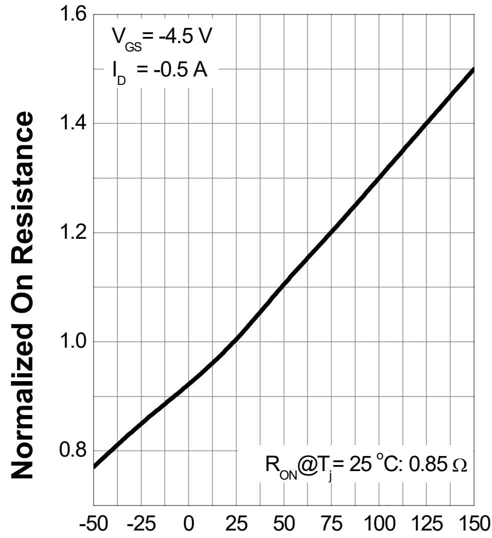

Thermal Transient Impedance
2
1
0.1
0.01
1E-4 1E-3 0.01 0.1 1 10 100
Normalized Effective Transient
Duty = 0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
Mounted on 1in2 pad
RθJA : 150 °C/W
Square Wave Pulse Duration (sec)

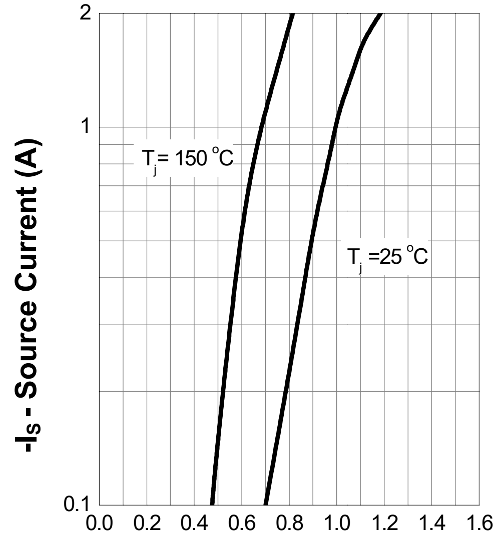

Output Characteristics
-ID - Drain Current (A)
VGS= -3,-4,-5,-6,-7.-8,-9.-10 V
-2.0 V
-1.0 V
-VDS - Drain-Source Voltage (V)

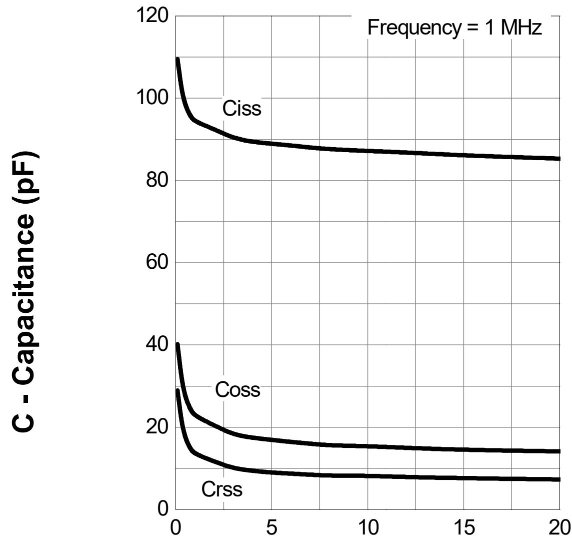

Drain-Source On Resistance
RDS(ON) - On Resistance (Ω)
VGS= -2.5 V
VGS= -4.5V
-ID - Drain Current (A)

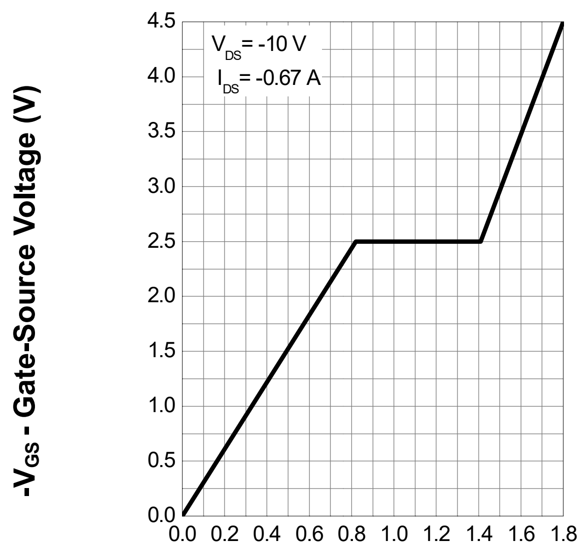

Transfer Characteristics
RDS(ON) - On Resistance (Ω)
ID= -0.5 A
-VGS - Gate-Source Voltage (V)


Gate Threshold Voltage
Normalized Threshold Voltage
IDS = -250 μA
Tj - Junction Temperature (°C)


Drain-Source On Resistance
Normalized On Resistance
1.6
1.4
1.2
1.0
0.8
V_GS = -4.5 V
I_D = -0.5 A
R_ON@T_j = 25 °C: 0.85 Ω
-50 -25 0 25 50 75 100 125 150
T_j - Junction Temperature (°C)


Source-Drain Diode Forward
-I_S - Source Current (A)
2
1
0.1
T_j = 150 °C
T_j =25 °C
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6
-V_SD - Source-Drain Voltage (V)


Capacitance
C - Capacitance (pF)
120
100
80
60
40
20
0
Frequency = 1 MHz
Ciss
Coss
Crss
0 5 10 15 20
-V_DS - Drain-Source Voltage (V)


Gate Charge
-V_GS - Gate-Source Voltage (V)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
V_DS = -10 V
I_DS = -0.67 A
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8
Q_G - Gate Charge (pC)