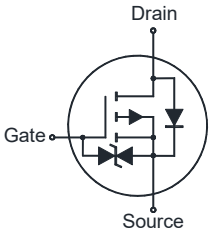
MKA03P2K5UK-AH

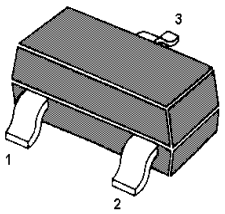
P-Channel Enhancement Mode MOSFET

Features

- AEC-Q101 Qualified
- Low threshold voltage
- Built-in G-S Protection Diode
- Halogen and Antimony Free(HAF), RoHS compliant
- Typical ESD Protection HBM Class H2

Component Classification	Maximum Withstand Voltage
H0	≤ 250 V
H1A	> 250 V to ≤ 500 V
H1B	> 500 V to ≤ 1000 V
H1C	> 1000 V to ≤ 2000 V
H2	> 2000 V to ≤ 4000 V
H3A	> 4000 V to ≤ 8000 V
H3B	> 8000 V





1. Gate 2. Source 3. Drain
SOT-23 Plastic Package

Applications

- Portable appliances

Absolute Maximum Ratings (at T_a = 25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	30	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current	$-I_D$	360	mA
Peak Drain Current, Pulsed [1]	$-I_{DM}$	1.4	A
Total Power Dissipation [2]	P_{tot}	500	mW
Operating Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	- 55 to + 150	℃

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal Resistance-Junction to Ambient [2]	Steady State	$R_{\theta JA}$	250	℃/W

[1] Pulse Test: Pulse Width ≤ 100 μs, Duty Cycle ≤ 2%,Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

[2] Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.

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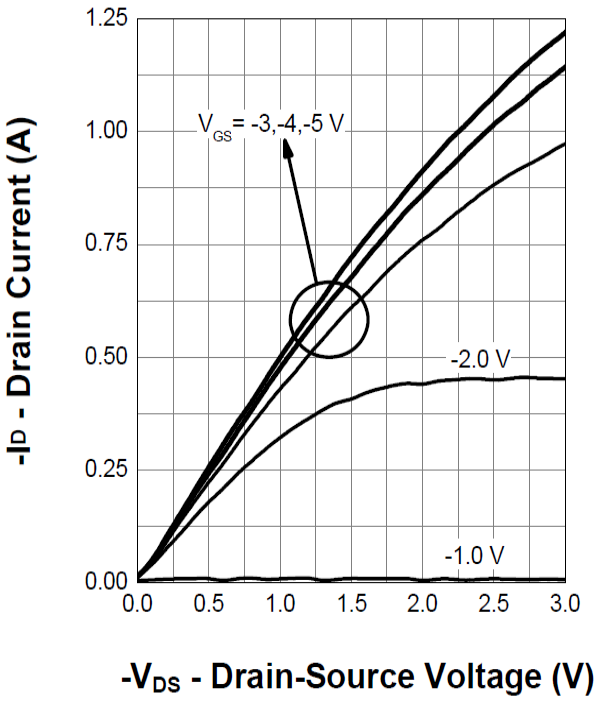
Characteristics at T_a = 25℃ unless otherwise specified

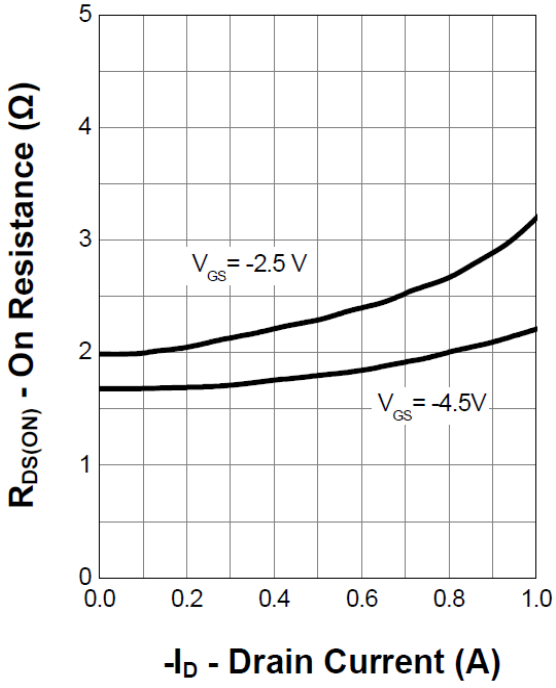
Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $-I_D$ = 250 µA	$-V_{(BR)DSS}$	30	-	-	V
Zero Gate Voltage Drain Current at $-V_{DS}$ = 24 V	$-I_{DSS}$	-	-	1	µA
Gate-Source Leakage at V_{GS} = ± 8 V	I_{GSS}	-	-	± 10	µA
Gate-Source Threshold Voltage at V_{DS} = V_{GS}, $-I_D$ = 250 µA	$-V_{GS(th)}$	0.4	-	1.0	V
Drain-Source On-State Resistance at $-V_{GS}$ = 4.5 V, $-I_D$ = 0.3 A at $-V_{GS}$ = 2.5 V, $-I_D$ = 0.2 A at $-V_{GS}$ = 1.8 V, $-I_D$ = 0.1 A	$R_{DS(on)}$	- - -	- - -	2.5 2.9 5	Ω
DYNAMIC PARAMETERS					
Input Capacitance at $-V_{DS}$ = 10 V, V_{GS} = 0 V, f = 1 MHz	C_{iss}	-	50	-	pF
Output Capacitance at $-V_{DS}$ = 10 V, V_{GS} = 0 V, f = 1 MHz	C_{oss}	-	6	-	pF
Reverse Transfer Capacitance at $-V_{DS}$ = 10 V, V_{GS} = 0 V, f = 1 MHz	C_{rss}	-	5	-	pF
Total Gate Charge at $-V_{DS}$ = 10 V, $-V_{GS}$ = 4.5 V, $-I_D$ = 0.1 A at $-V_{DS}$ = 10 V, $-V_{GS}$ = 2.5 V, $-I_D$ = 0.1 A	Q_g	- -	1.22 0.8	- -	nC
Gate to Source Charge at $-V_{DS}$ = 10 V, $-V_{GS}$ = 4.5 V, $-I_D$ = 0.1 A	Q_{gs}	-	0.33	-	nC
Gate to Drain Charge at $-V_{DS}$ = 10 V, $-V_{GS}$ = 4.5 V, $-I_D$ = 0.1 A	Q_{gd}	-	0.22	-	nC
Turn-On Delay Time at $-V_{DD}$ = 10 V, $-V_{GS}$ = 4.5 V, $-I_D$ = 0.1 A, R_G = 6 Ω	$t_{d(on)}$	-	3.4	-	ns
Turn-On Rise Time at $-V_{DD}$ = 10 V, $-V_{GS}$ = 4.5 V, $-I_D$ = 0.1 A, R_G = 6 Ω	t_r	-	13	-	ns
Turn-Off Delay Time at $-V_{DD}$ = 10 V, $-V_{GS}$ = 4.5 V, $-I_D$ = 0.1 A, R_G = 6 Ω	$t_{d(off)}$	-	37	-	ns
Turn-Off Fall Time at $-V_{DD}$ = 10 V, $-V_{GS}$ = 4.5 V, $-I_D$ = 0.1 A, R_G = 6 Ω	t_f	-	23	-	ns
Body-Diode PARAMETERS					
Body Diode Voltage at $-I_S$ = 0.3 A	$-V_{SD}$	-	-	1.3	V
Body-Diode Continuous Current	$-I_S$	-	-	360	mA
Body Diode Reverse Recovery Time at $-I_S$ = 0.1 A, di/dt = 100 A / µs	t_{rr}	-	42	-	ns
Body Diode Reverse Recovery Charge at $-I_S$ = 0.1 A, di/dt = 100 A / µs	Q_{rr}	-	41	-	nC

Electrical Characteristics Curves

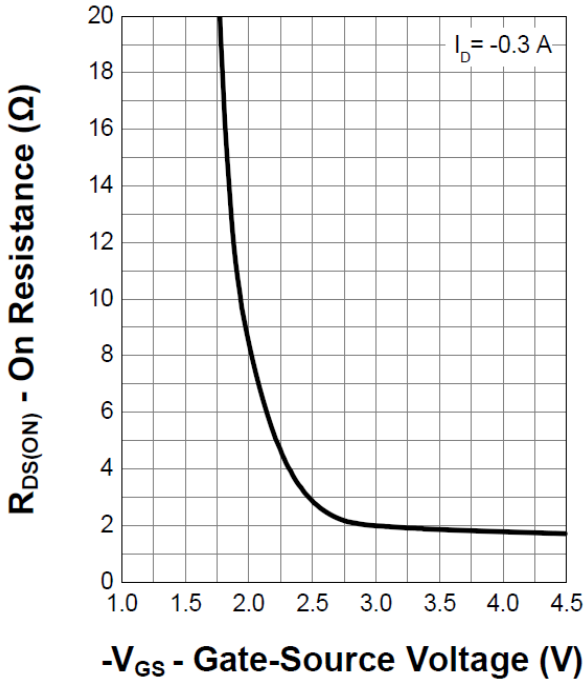
Output Characteristics



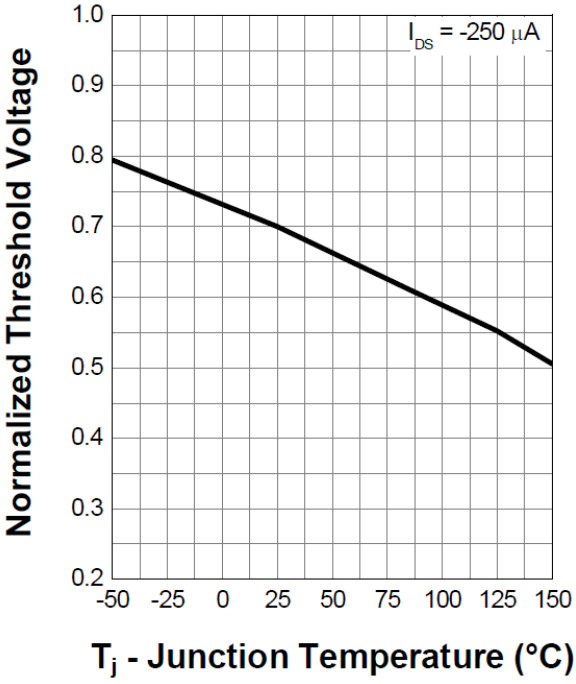
Drain-Source On Resistance



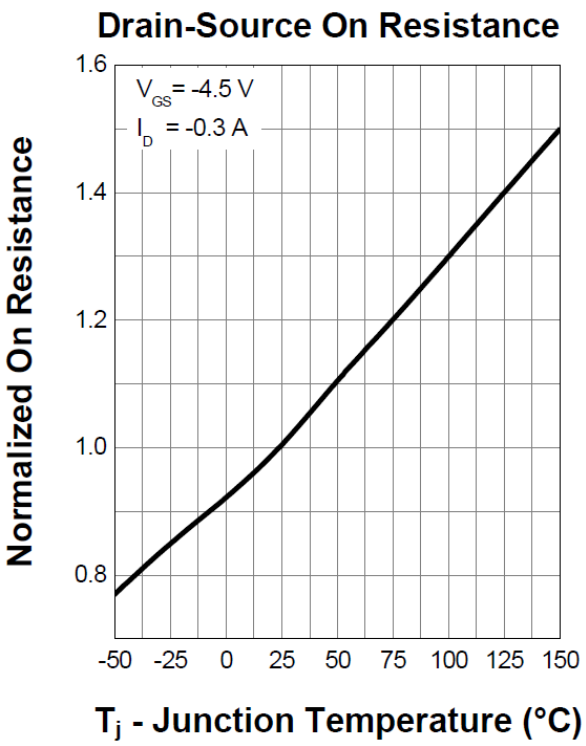
Transfer Characteristics

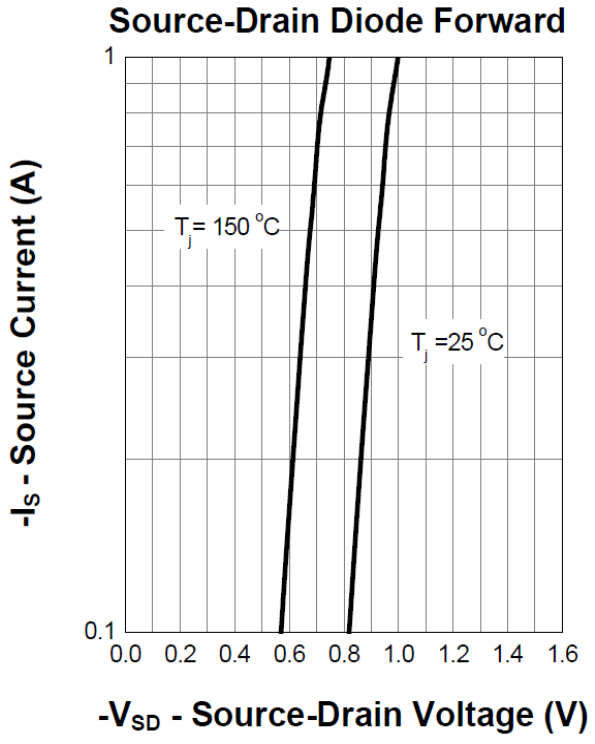


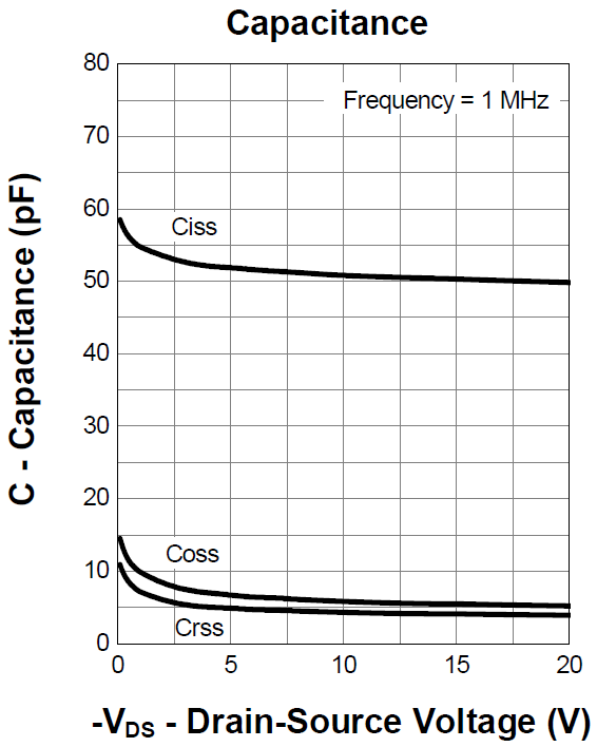
Gate Threshold Voltage

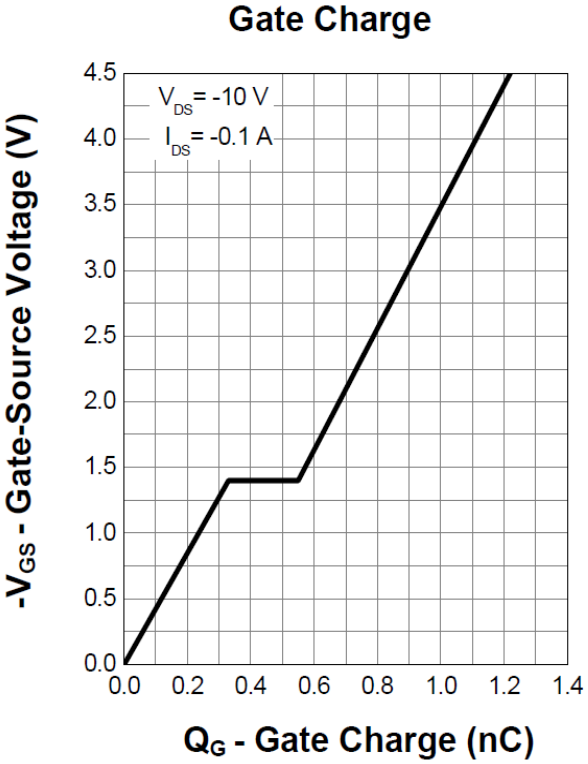


Electrical Characteristics Curves









Test Circuits

Fig.1-1 Switching times test circuit

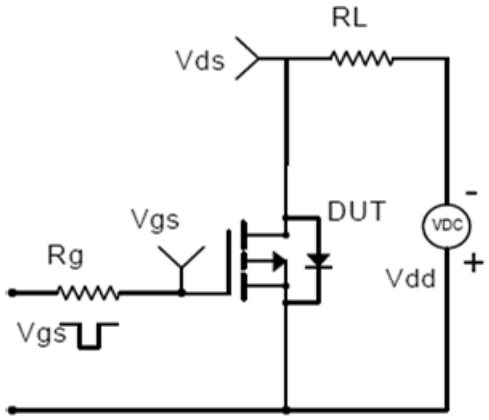


Fig.1-2 Switching Waveform

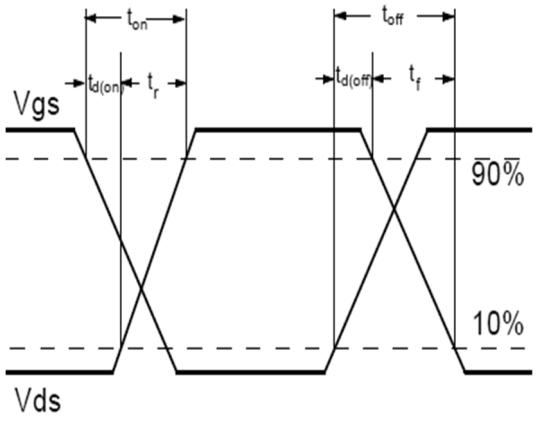


Fig.2-1 Gate charge test circuit

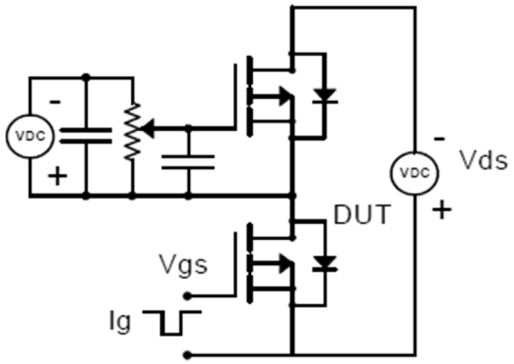
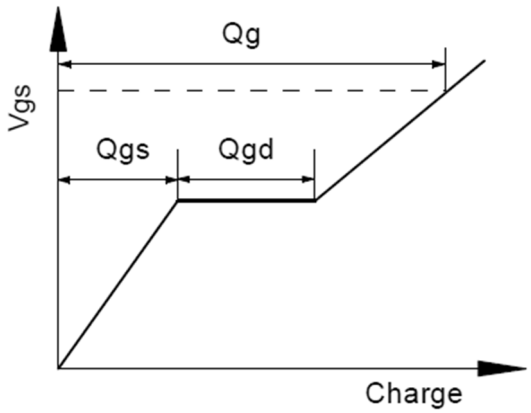


Fig.2-2 Gate charge waveform



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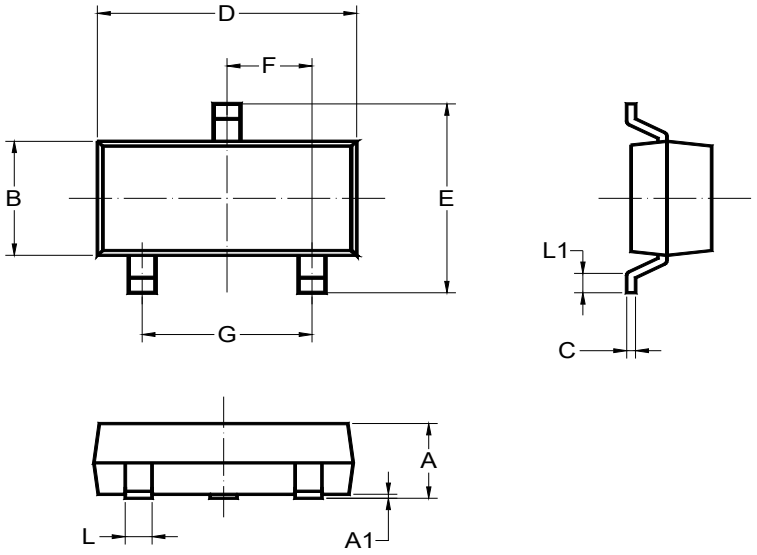
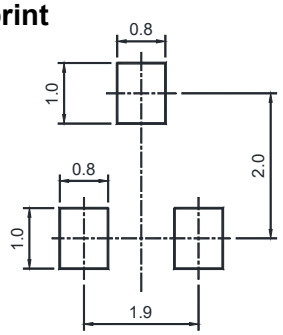
Package Outline (Dimensions in mm) SOT-23



Unit	A	A1	B	C	D	E	F	G	L	L1
mm	1.20 0.89	0.100 0.013	1.40 1.20	0.19 0.08	3.04 2.80	2.6 2.2	1.02 0.89	2.04 1.78	0.51 0.37	0.2 MIN

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

" TB " = Part No.

" • " = HAF (Halogen and Antimony Free)

" YM " = Date Code Marking

" Y " = Year

" M " = Month

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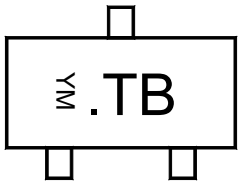

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