

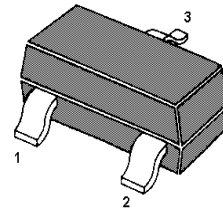
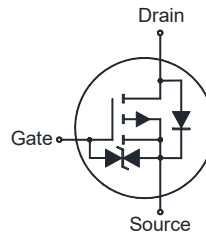
MKA03P2K5UK-AH

P-Channel Enhancement Mode MOSFET

Features

- AEC-Q101 Qualified
- Low threshold voltage
- Halogen and Antimony Free(HAF), RoHS compliant
- Typical ESD Protection HBM Class 2

Classification	Voltage Range(V)
0A	< 125
0B	125 to < 250
1A	250 to < 500
1B	500 to < 1000
1C	1000 to < 2000
2	2000 to < 4000
3A	4000 to < 8000
3B	≥ 8000



1. Gate 2. Source 3. Drain
TO-236 Plastic Package

Applications

- Portable appliances

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

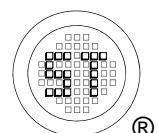
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	30	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current	$-I_D$	0.36	A
Peak Drain Current, Pulsed ¹⁾	$-I_{DM}$	1.4	A
Power Dissipation ²⁾	P_D	0.5	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 55 to + 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance-Junction to Ambient ²⁾ Steady State	$R_{\theta JA}$	250	$^\circ\text{C/W}$

¹⁾ Pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2 \%$.

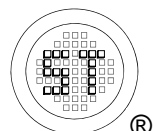
²⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.



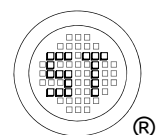
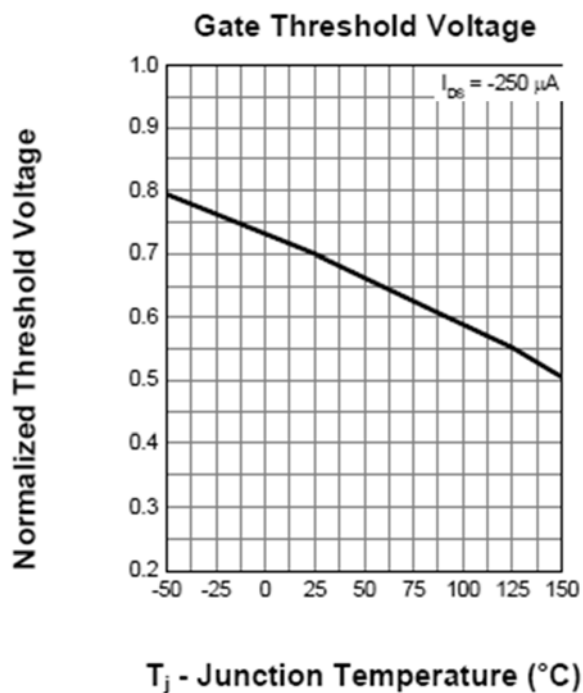
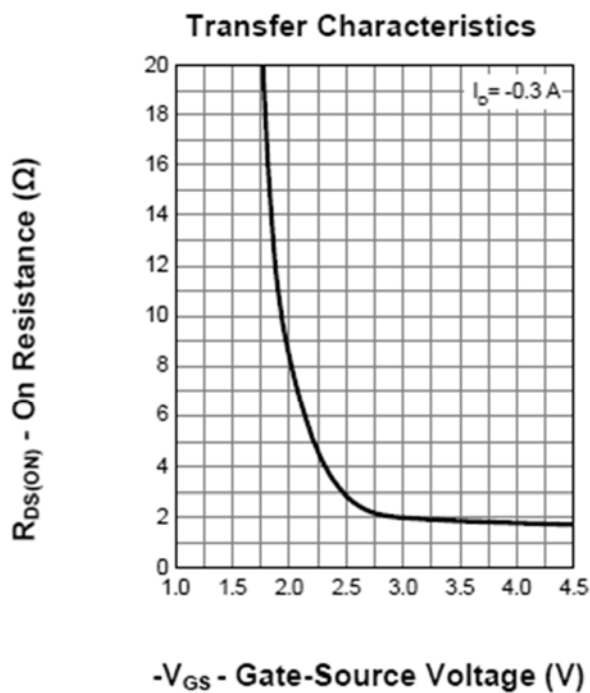
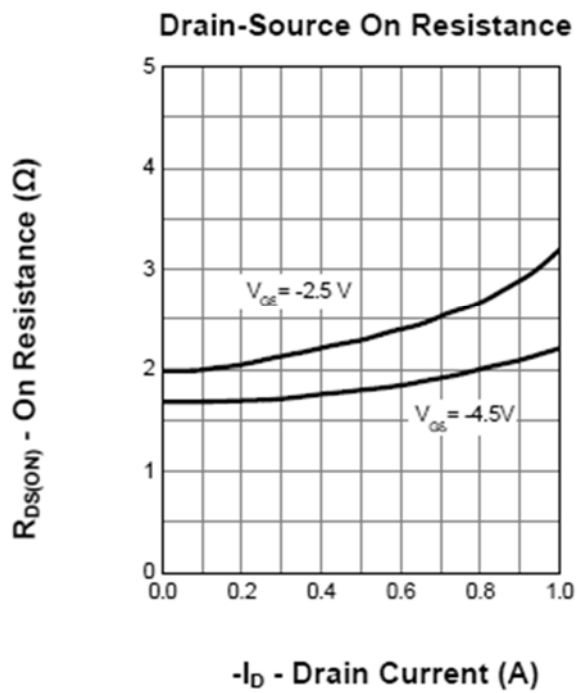
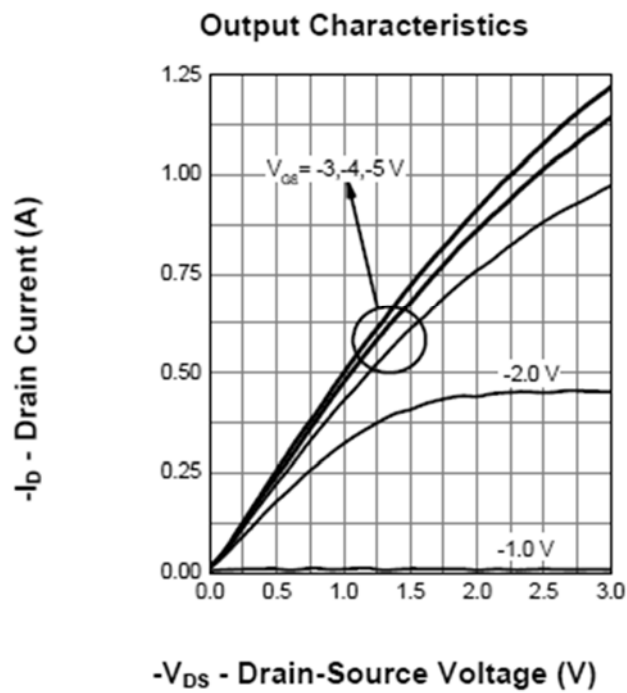
MKA03P2K5UK-AH

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

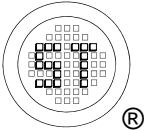
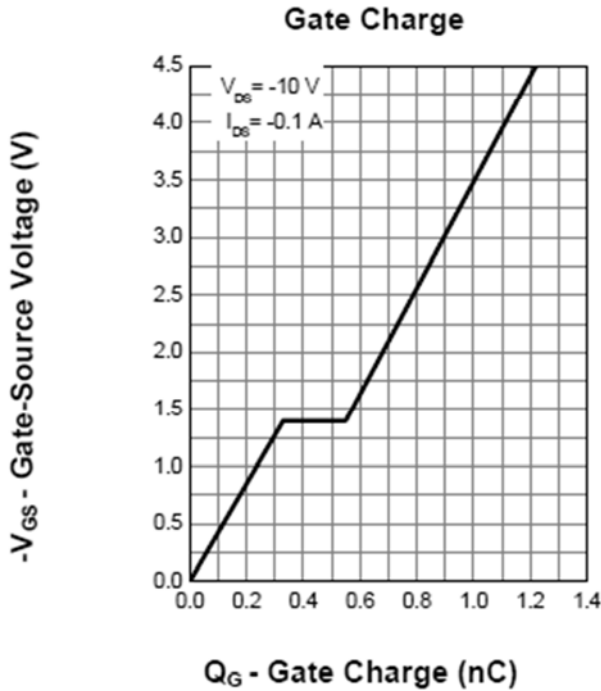
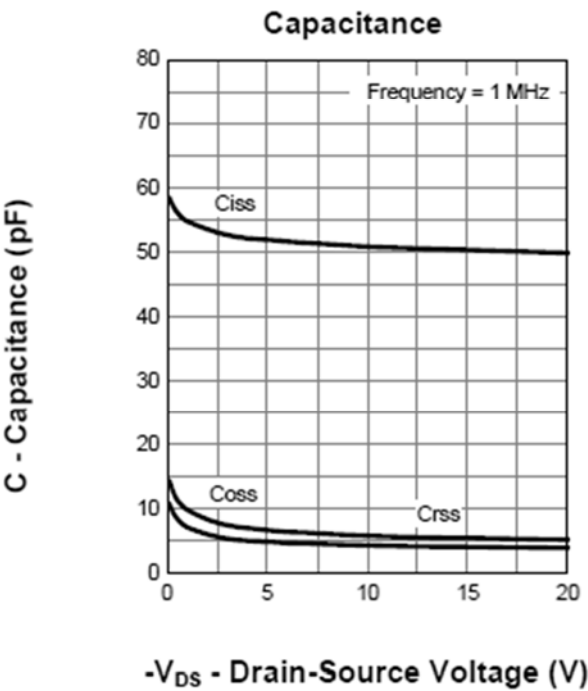
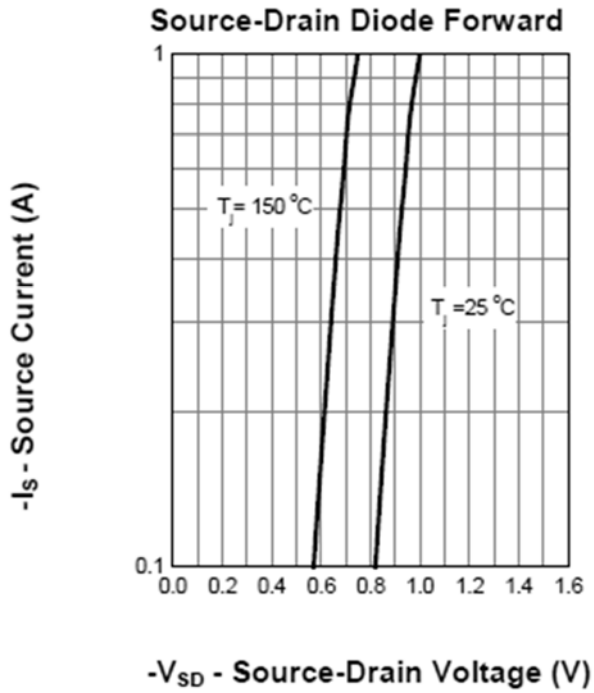
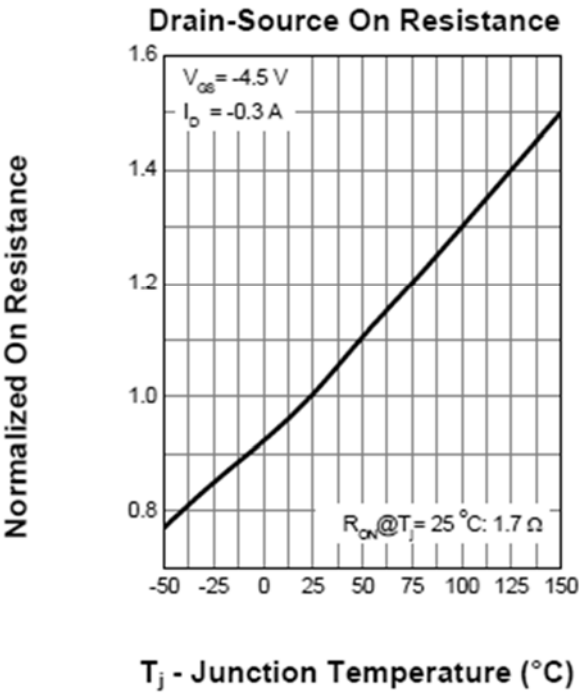
Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $-I_D = 250\ \mu\text{A}$	$-V_{(BR)DSS}$	30	-	-	V
Zero Gate Voltage Drain Current at $-V_{DS} = 24\ \text{V}$	$-I_{DSS}$	-	-	1	μA
Gate-Source Leakage at $V_{GS} = \pm 8\ \text{V}$	I_{GSS}	-	-	± 10	μA
Gate-Source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



Electrical Characteristics Curves



Electrical Characteristics Curves



Test Circuits

Fig.1-1 Switching times test circuit

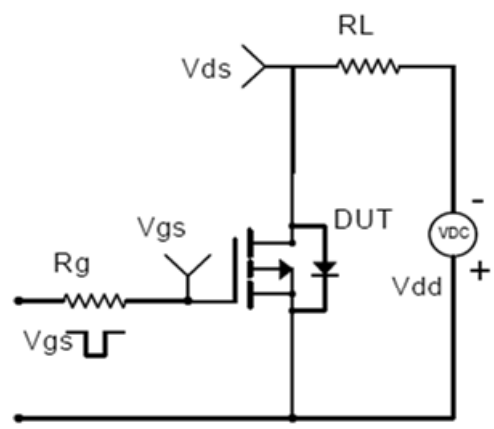


Fig.1-2 Switching Waveform

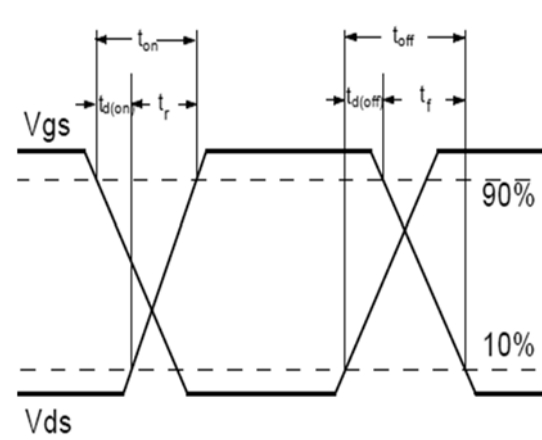


Fig.2-1 Gate charge test circuit

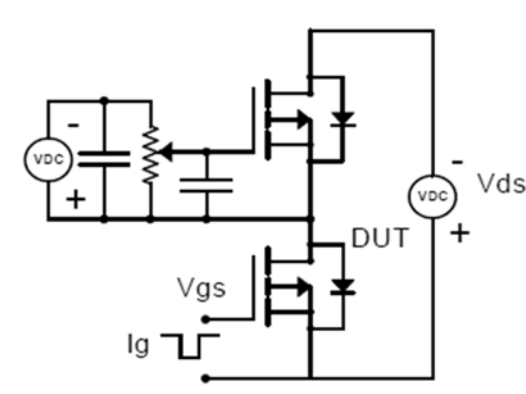
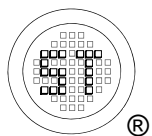
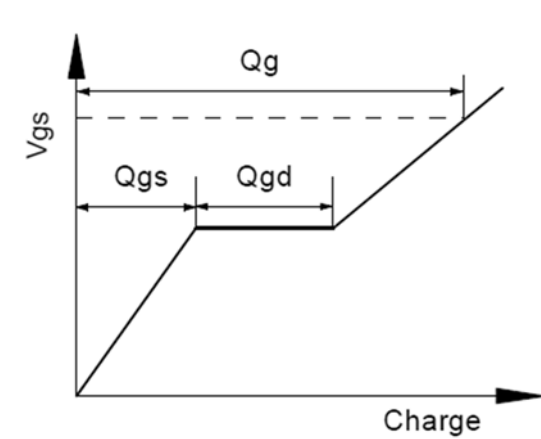
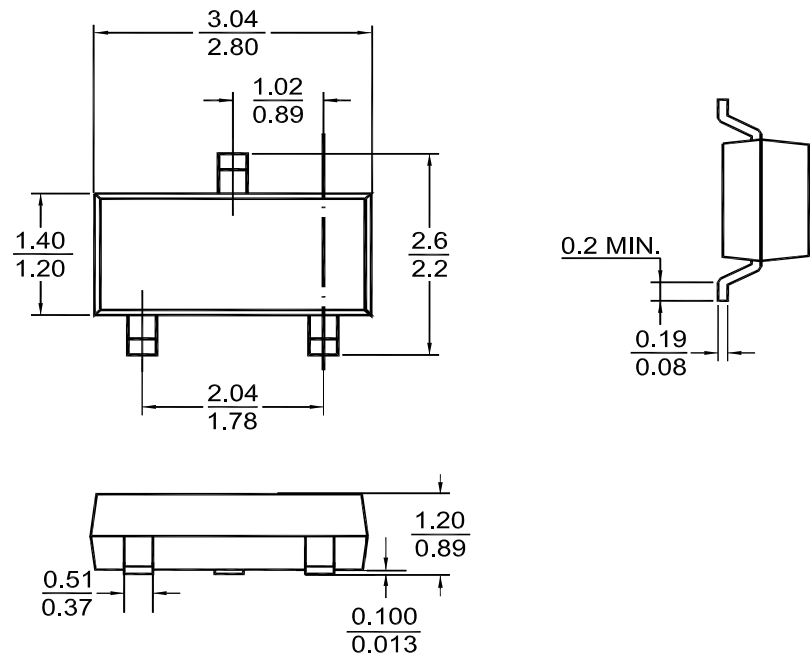


Fig.2-2 Gate charge waveform

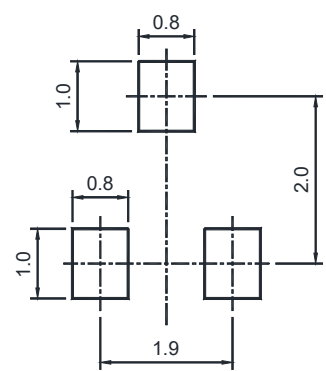


Package Outline (Dimensions in mm)

TO-236



Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
TO-236	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
- Font type: Arial

