

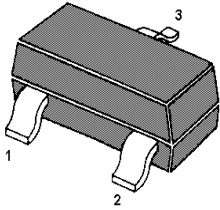
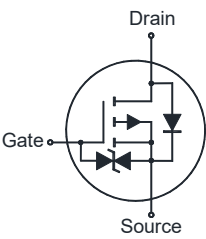
MKA03P2K5UK-CH

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	$\leq 250\text{ V}$
H1A	$> 250\text{ V to } \leq 500\text{ V}$
H1B	$> 500\text{ V to } \leq 1000\text{ V}$
H1C	$> 1000\text{ V to } \leq 2000\text{ V}$
H2	$> 2000\text{ V to } \leq 4000\text{ V}$
H3A	$> 4000\text{ V to } \leq 8000\text{ V}$
H3B	$> 8000\text{ V}$



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

Applications

- Portable appliances

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

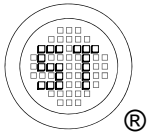
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	30	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current	$-I_D$	360	mA
Peak Drain Current, Pulsed ¹⁾	$-I_{DM}$	1.4	A
Total Power Dissipation ²⁾	P_{tot}	500	mW
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150	$^\circ\text{C}$

Thermal Characteristics

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

¹⁾ Pulse Test: Pulse Width $\leq 100\text{ }\mu\text{s}$, Duty Cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.

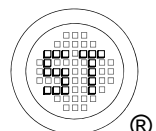
²⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.



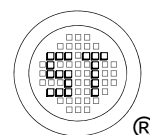
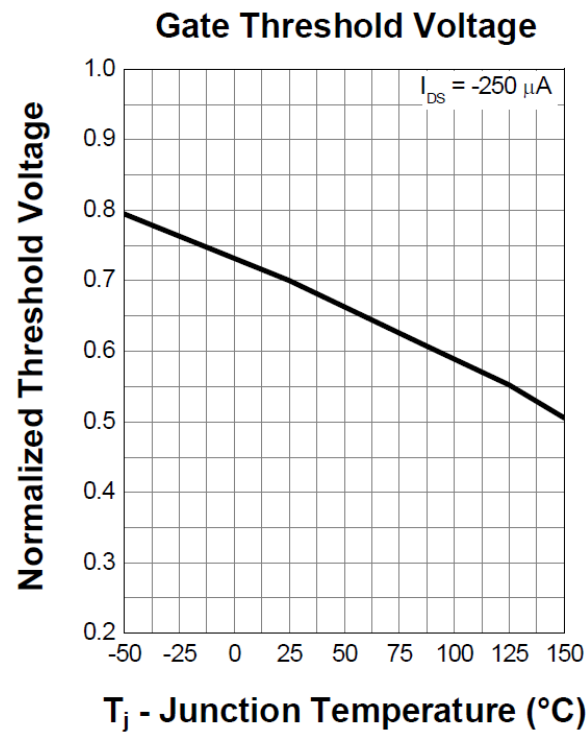
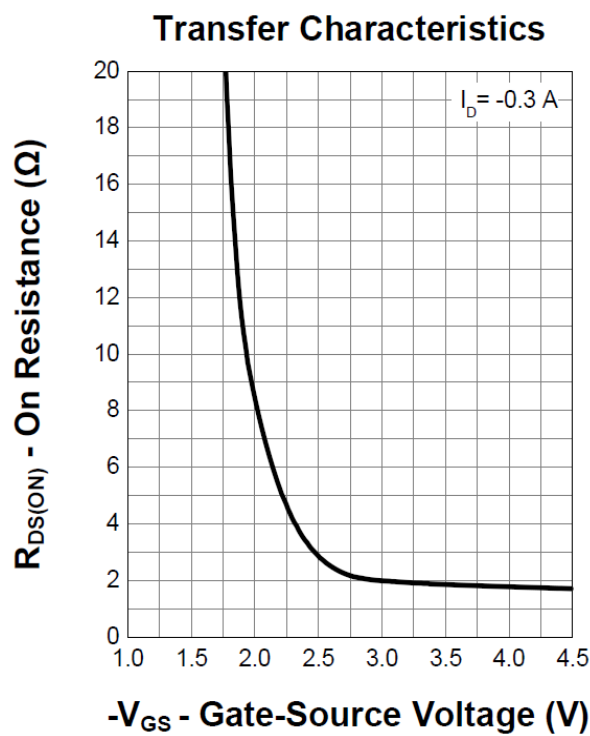
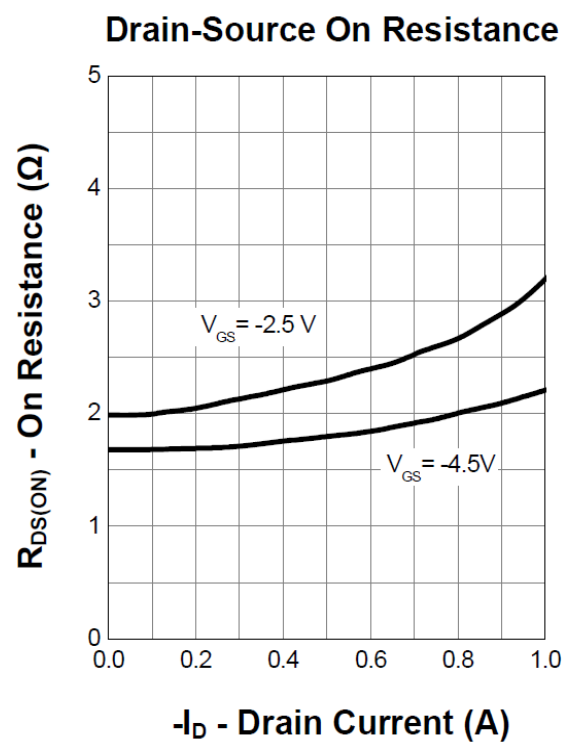
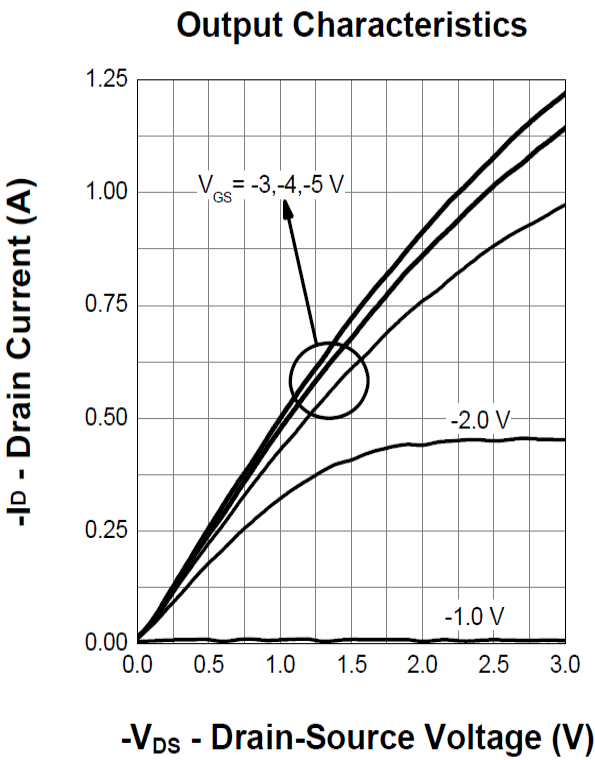
MKA03P2K5UK-CH

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

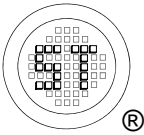
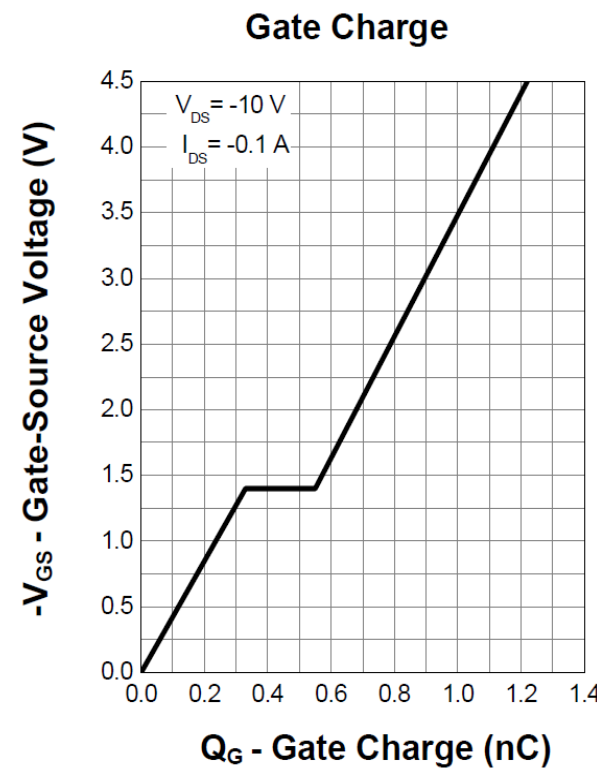
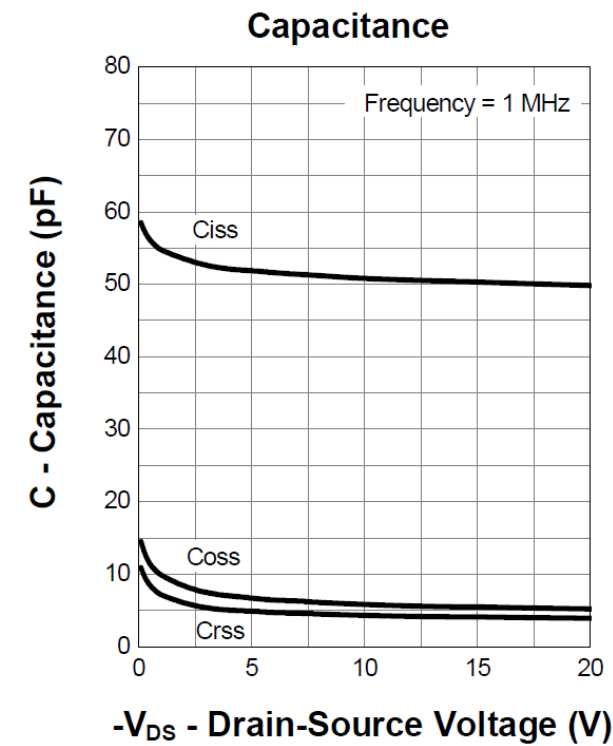
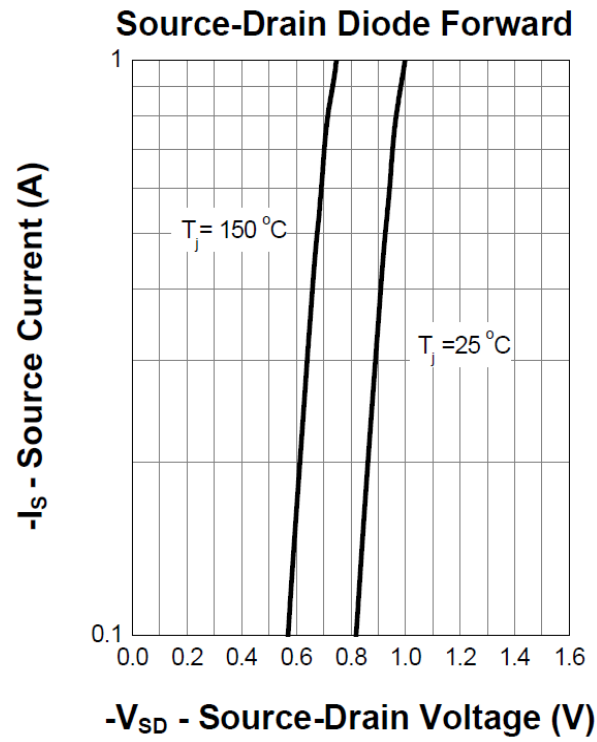
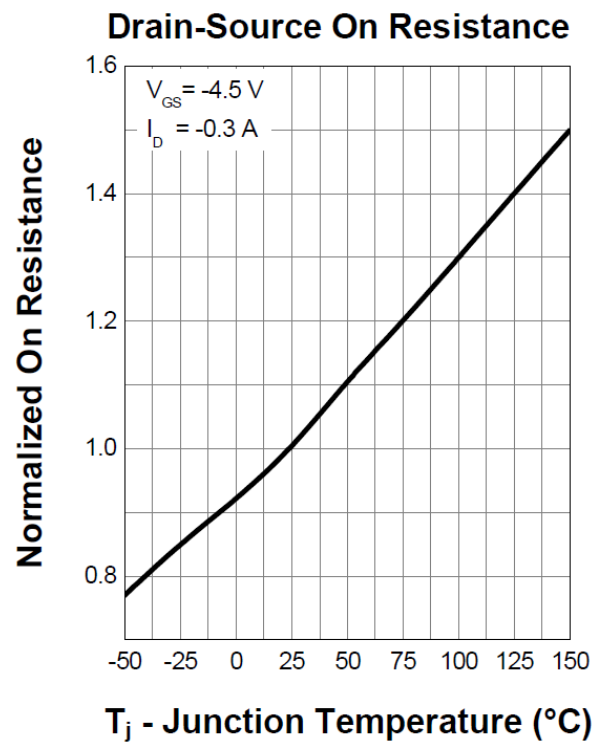
Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $-I_D = 250\ \mu\text{A}$	$-V_{(BR)DSS}$	30	-	-	V
Zero Gate Voltage Drain Current at $-V_{DS} = 24\ \text{V}$	$-I_{DSS}$	-	-	1	μA
Gate-Source Leakage at $V_{GS} = \pm 8\ \text{V}$	I_{GSS}	-	-	± 10	μA
Gate-Source 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 $-V_{DS} = 10\ \text{V}$, $-V_{GS} = 4.5\ \text{V}$, $-I_D = 0.1\ \text{A}$ at $-V_{DS} = 10\ \text{V}$, $-V_{GS} = 2.5\ \text{V}$, $-I_D = 0.1\ \text{A}$	Q_g	- -	1.22 0.8	- -	nC
Gate to 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 to 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 Continuous Current	$-I_S$	-	-	360	mA
Body Diode Reverse Recovery Time at $-I_S = 0.1\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	t_{rr}	-	42	-	ns
Body Diode Reverse Recovery Charge at $-I_S = 0.1\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	Q_{rr}	-	41	-	nC



Electrical Characteristics Curves



Electrical Characteristics Curves



Test Circuits

Fig.1-1 Switching times test circuit

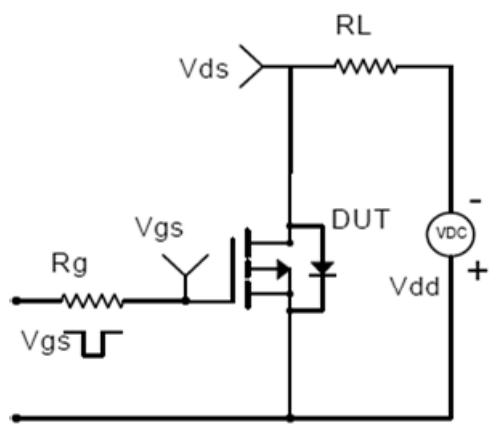


Fig.1-2 Switching Waveform

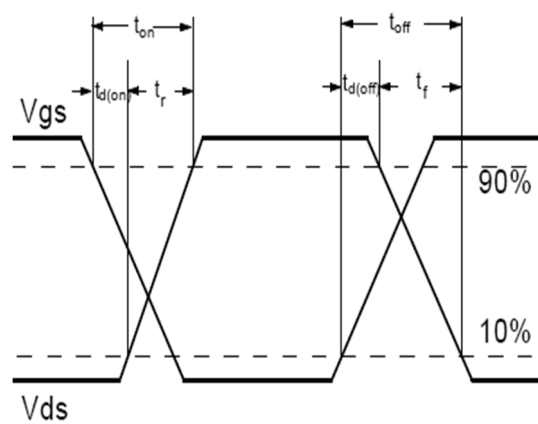


Fig.2-1 Gate charge test circuit

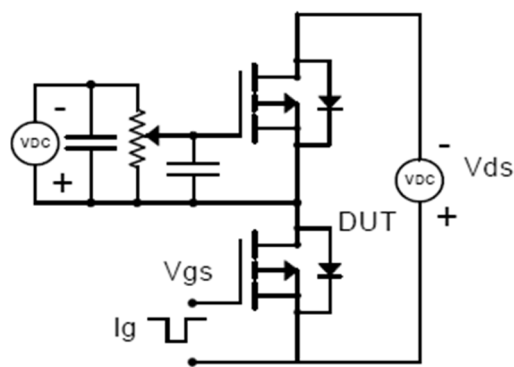
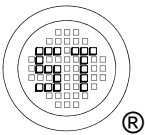
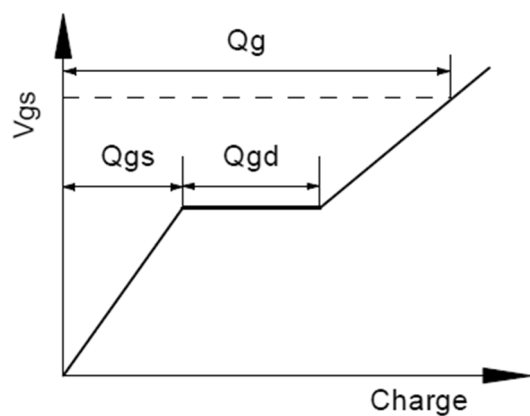


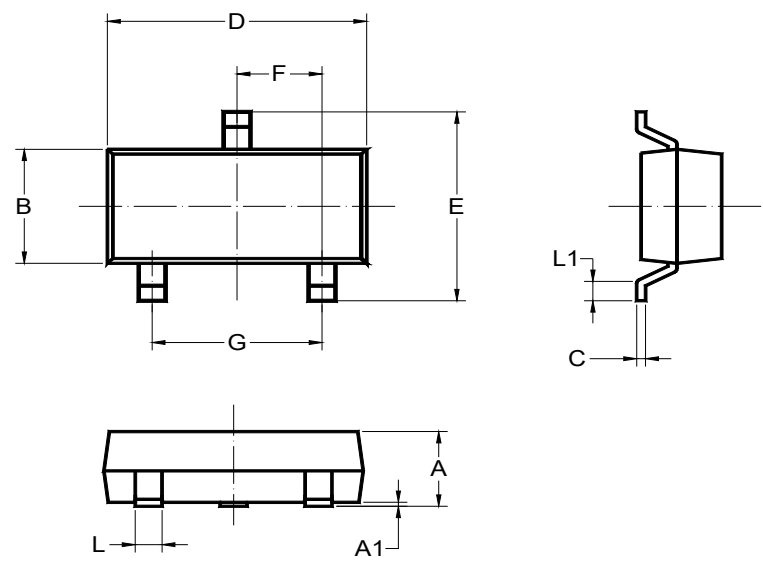
Fig.2-2 Gate charge waveform



MKA03P2K5UK-CH

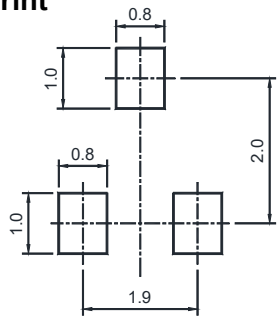
Package Outline (Dimensions in mm)

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



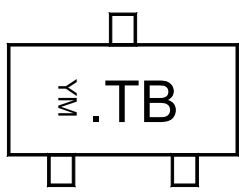
Packing information

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

Font type: Arial



Disclaimer: Our company reserve the right to make modifications, enhancements, improvements, corrections or other changes to improve product design, functions and reliability, anytime without notice. Semtech Electronics Limited makes no warranties, representations or warranties regarding the suitability of its products for any particular purpose, and does not accept any liability arising from the application or use of any product or circuit such as: Apply to medical, military, aircraft, space or life support equipment and expressly waive any and all liability, including but not limited to special, consequential or collateral damage.

