

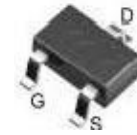
KBM2302CA

N-Channel Enhancement Mode MOSFET

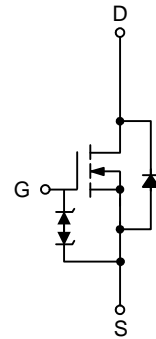
Features

- 20V/3.6 A ,
 - $R_{DS(ON)} = 45m\Omega$ (typ.) @ $V_{GS} = 10V$
 - $R_{DS(ON)} = 65m\Omega$ (typ.) @ $V_{GS} = 4.5V$
 - $R_{DS(ON)} = 80m\Omega$ (typ.) @ $V_{GS} = 2.5V$
 - $R_{DS(ON)} = 95m\Omega$ (typ.) @ $V_{GS} = 1.8V$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free Available (RoHS Compliant)

Pin Description



Top View of SOT-23



N-Channel MOSFET

Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems

Ordering and Marking Information

<p>KBM2302C □□-□□□</p> <ul style="list-style-type: none"> □□ - □□□ : Lead Free Code □□ : Handling Code □□ : Temp. Range □□ : Package Code 	<p>Package Code A : SOT-23 Operating Junction Temp. Range C : -55 to 150 °C Handling Code TR : Tape & Reel Lead Free Code L : Lead Free Device</p>
<p>KBM2302C A : 026X</p>	<p>X - Date Code</p>

Cover Tape Dimensions

Application	Devices Per Reel
SOT23-3	3000

KBM2302CA

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

Symbol	Parameter	Rating	Unit	
V_{DSS}	Drain-Source Voltage	20	V	
V_{GSS}	Gate-Source Voltage	± 12		
I_D^*	Continuous Drain Current	$V_{GS}=10V$	A	
I_{DM}^*	300 μ s Pulsed Drain Current			11
I_S^*	Diode Continuous Forward Current	1	A	
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150		
P_D^*	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	0.83	W
		$T_A=100^\circ\text{C}$	0.3	
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	150	$^\circ\text{C}/\text{W}$	

Notes:

*Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$.

Electrical Characteristics $(T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Condition	KBM2302CA			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu\text{A}$	20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=16V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			1	μA
					30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu\text{A}$	0.5	0.75	1	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$			± 10	μA
$R_{DS(ON)}^a$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=6A$		45	60	m Ω
		$V_{GS}=4.5V, I_{DS}=3A$		65	80	
		$V_{GS}=2.5V, I_{DS}=2A$		80	95	
		$V_{GS}=1.8V, I_{DS}=1A$		95	150	
V_{SD}^a	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$		0.7	1.3	V
Gate Charge Characteristics^b						
Q_g	Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V,$ $I_{DS}=3.6A$		6	8	nC
Q_{gs}	Gate-Source Charge			0.7		
Q_{gd}	Gate-Drain Charge			3		

KBM2302CA

Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Condition	KBM2300CA			Unit
			Min.	Typ.	Max.	
Dynamic Characteristics^b						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		6		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=10V,$ Frequency=1.0MHz		586		pF
C_{oss}	Output Capacitance			101		
C_{rss}	Reverse Transfer Capacitance			90		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=10V, R_L=10\Omega,$ $I_{DS}=1A, V_{GEN}=4.5V,$ $R_G=6\Omega$		5	10	ns
t_r	Turn-on Rise Time			15	28	
$t_{d(OFF)}$	Turn-off Delay Time			26	48	
t_f	Turn-off Fall Time			15	28	
t_{rr}	Reverse Recovery Time	$I_{SD}=6A, dI_{SD}/dt=100A/\mu s$		21		ns
Q_{rr}	Reverse Recovery Charge			8		nC

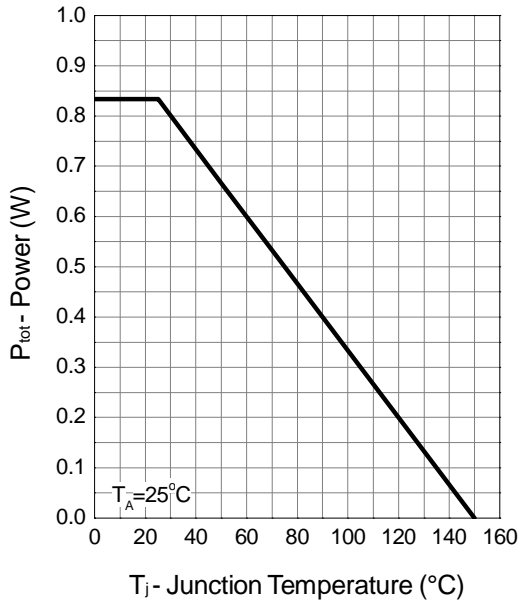
Notes:

- a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- b : Guaranteed by design, not subject to production testing.

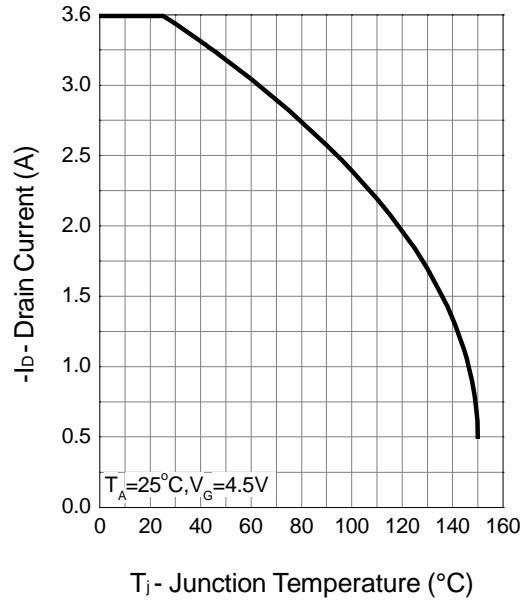
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Typical Characteristics

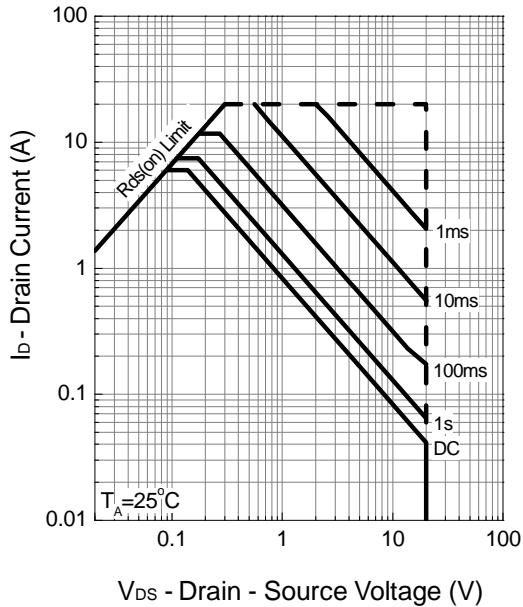
Power Dissipation



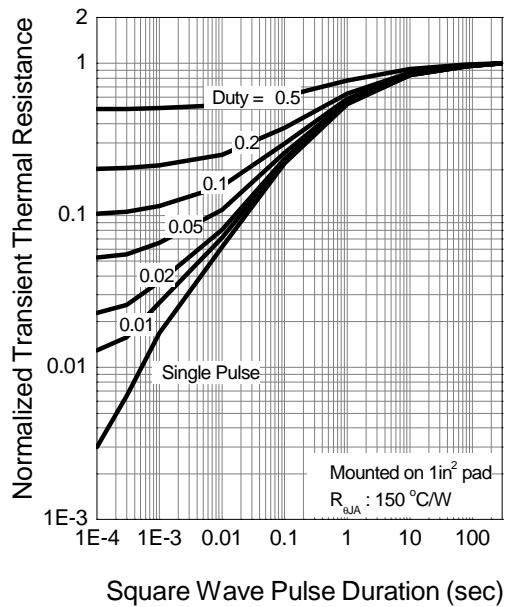
Drain Current



Safe Operation Area



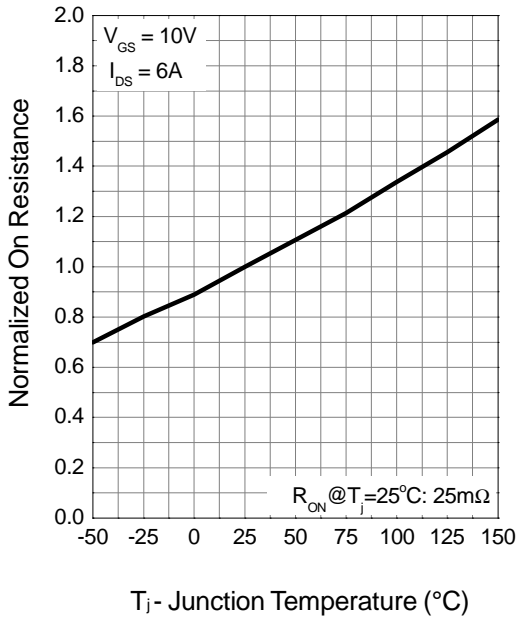
Thermal Transient Impedance



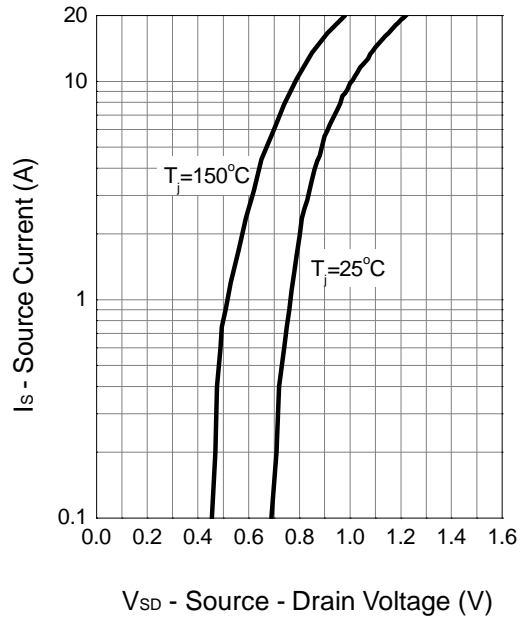
KBM2302CA

Typical Characteristics (Cont.)

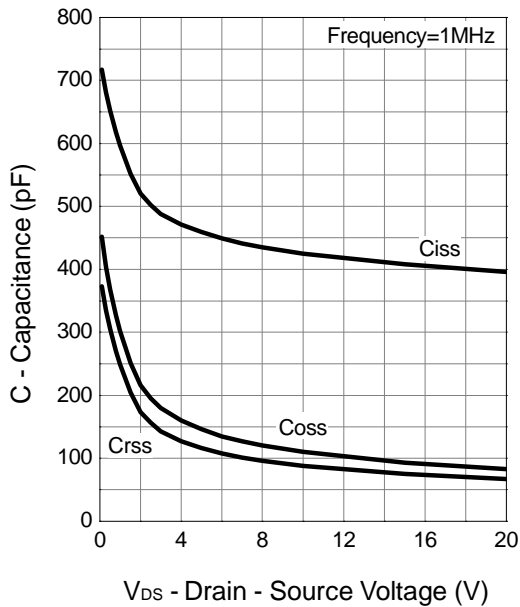
Drain-Source On Resistance



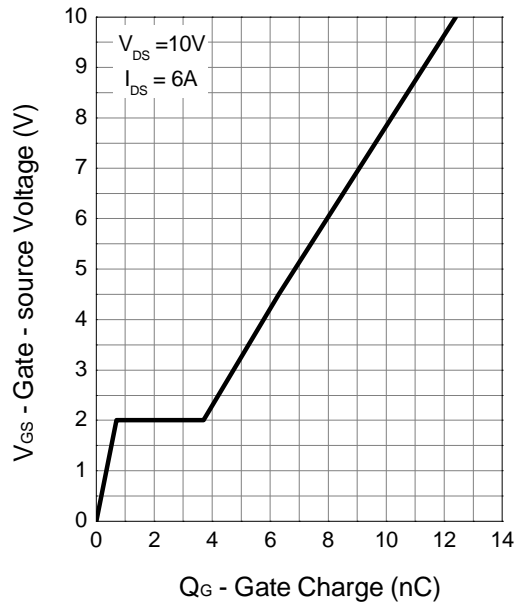
Source-Drain Diode Forward



Capacitance



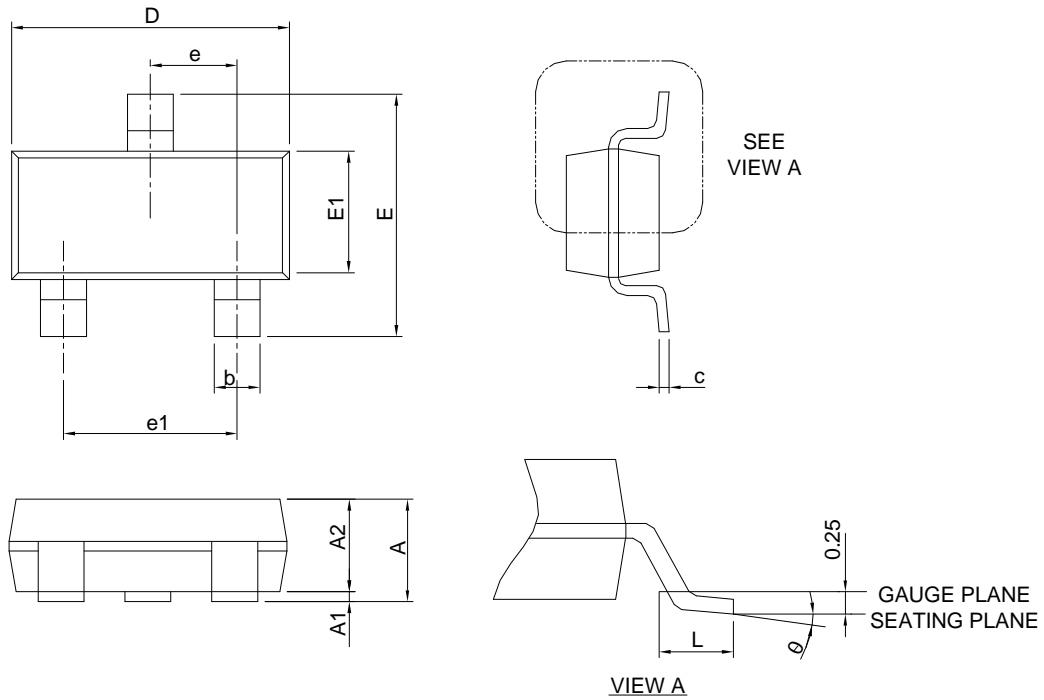
Gate Charge



KBM2302CA

Packaging Information

SOT23-3



SYMBOL	SOT23-3			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		1.45		0.057
A1	0.00	0.15	0.000	0.006
A2	0.90	1.30	0.035	0.051
b	0.30	0.50	0.012	0.020
c	0.08	0.22	0.003	0.009
D	2.90 BSC		0.114 BSC	
E	2.80 BSC		0.110 BSC	
E1	1.60 BSC		0.063 BSC	
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
θ	0°	8°	0°	8°