

ATM3415KPSA

P-Channel Enhancement Mode Power Transistor

Drain-Source Voltage: -20V

Continuous Drain Current: -4A

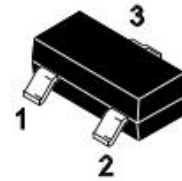
Features

- ◆ Low gate charge
- ◆ High density cell design for ultra low $R_{DS(on)}$
- ◆ ESD protected(HBM) up to 2KV

Application

- ◆ Load switch
- ◆ PWM applications
- ◆ Power management

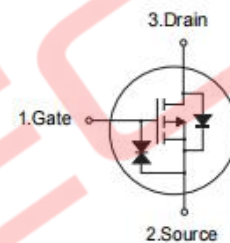
SOT-23



1. Gate 2.Source 3.Drain

Marking Code: 3415K

Schematic Diagram



Absolute Maximum Ratings

Ratings at $T_A = 25^\circ\text{C}$ unless otherwise specified.

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$-V_{DS}$	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current	$-I_D$	4	A
Power Dissipation	P_D	0.9	W
Junction and Storage Temperature Range	T_J, T_{STG}	150, -55 to 150	$^\circ\text{C}$
Thermal Characteristics			
Parameter	Symbol	Typ.	Units
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	139	$^\circ\text{C/W}$

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Electrical Characteristics (Ta=25°C unless otherwise specified)

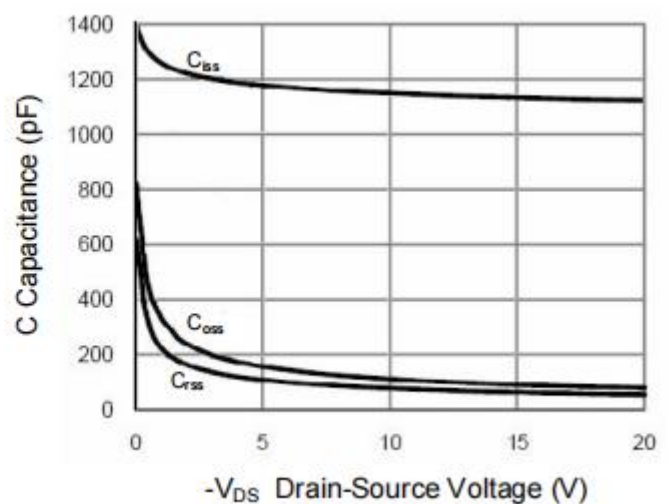
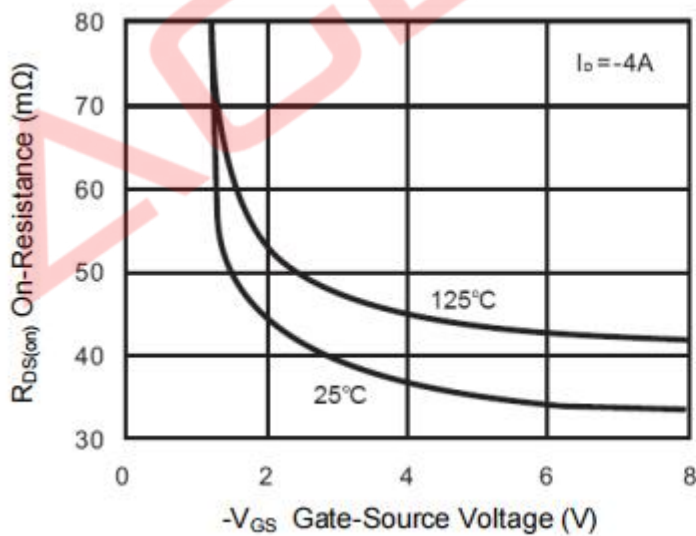
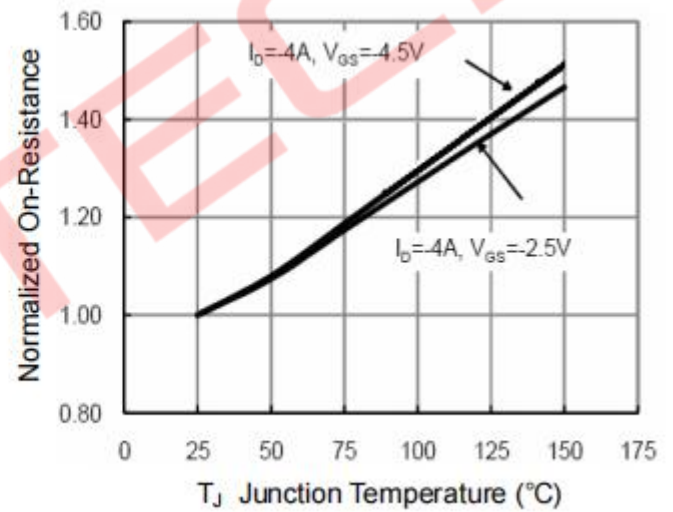
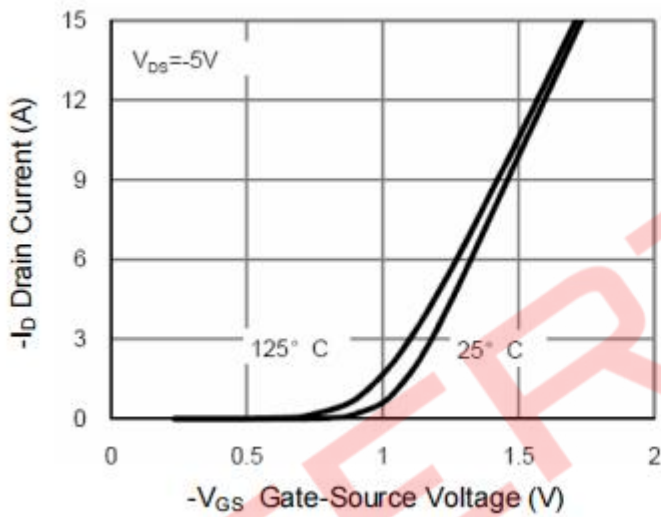
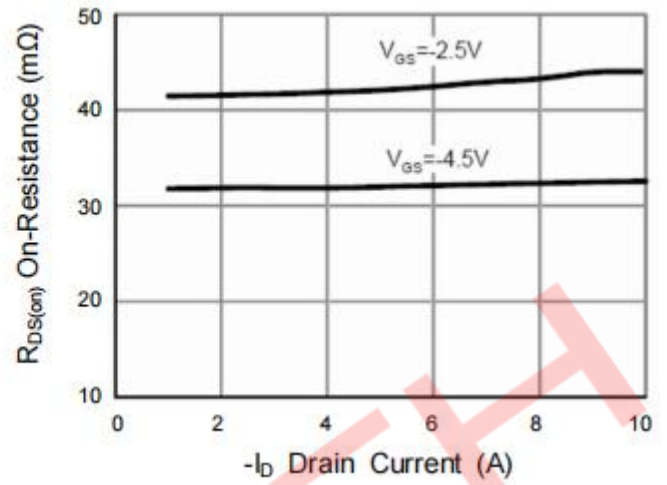
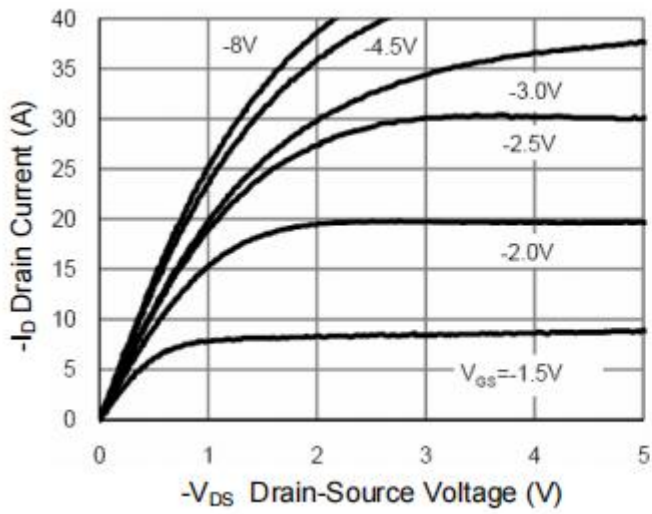
Parameter	Symbol	Test Condition	Min	Type	Max	Units
Static Characteristics						
Drain-source breakdown voltage	$-V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	20	-	-	V
Zero gate voltage drain current	$-I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$	-	-	1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 8V, V_{DS} = 0V$	-	-	± 10	μA
Gate threshold voltage ^{Note1}	$-V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	0.3	0.65	1	V
Drain-source on-resistance ^{Note1}	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -4A$	-	33	50	$m\Omega$
		$V_{GS} = -2.5V, I_D = -4A$	-	45	60	
Forward transconductance ^{Note1}	g_{FS}	$V_{DS} = -5V, I_D = -4A$	8	-	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -10V, V_{GS} = 0V, f = 1MHz$	-	1181.1	-	pF
Output Capacitance	C_{oss}		-	121.3	-	
Reverse Transfer Capacitance	C_{rss}		-	114.8	-	
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DS} = -10V, V_{GS} = -4.5V, R_{GEN} = 3\Omega, R_L = 2.5\Omega,$	-	12	-	ns
Turn-on rise time	t_r		-	10	-	
Turn-off delay time	$t_{d(off)}$		-	19	-	
Turn-off fall time	t_f		-	25	-	
Total gate charge	Q_g	$V_{DS} = -10V, V_{GS} = -4.5V, I_D = -4A$	-	10.2	-	nC
Gate-source charge	Q_{gs}		-	1.3	-	
Gate-drain charge	Q_{gd}		-	2.4	-	
Source-Drain Diode characteristics						
Diode Forward voltage ^{Note2}	$-V_{DS}$	$V_{GS} = 0V, I_S = -1A$	-	-	1.2	V
Diode Forward Current ^{Note1}	$-I_S$		-	-	4	A

Notes:1. Surface Mounted on FR4 Board, t_{10sec} .

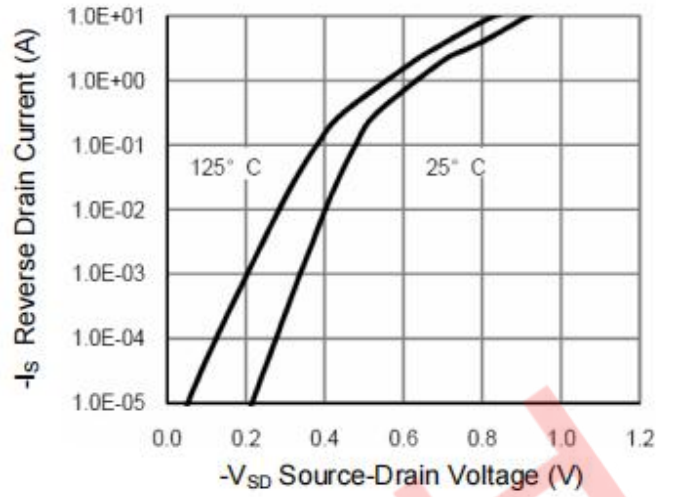
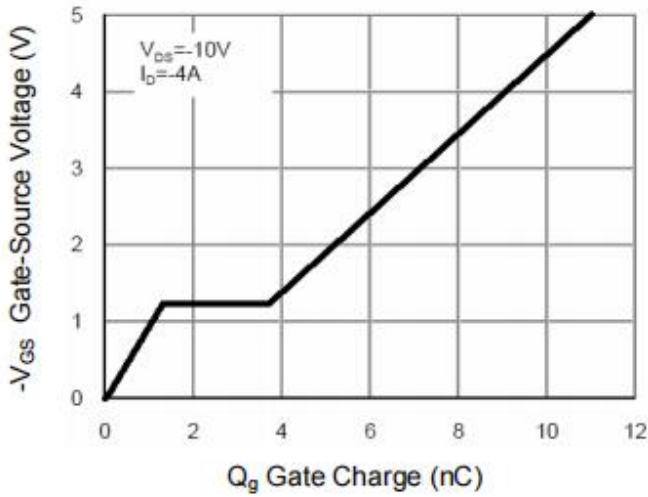
2. Pulse Test : Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

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Typical Characteristic Curves

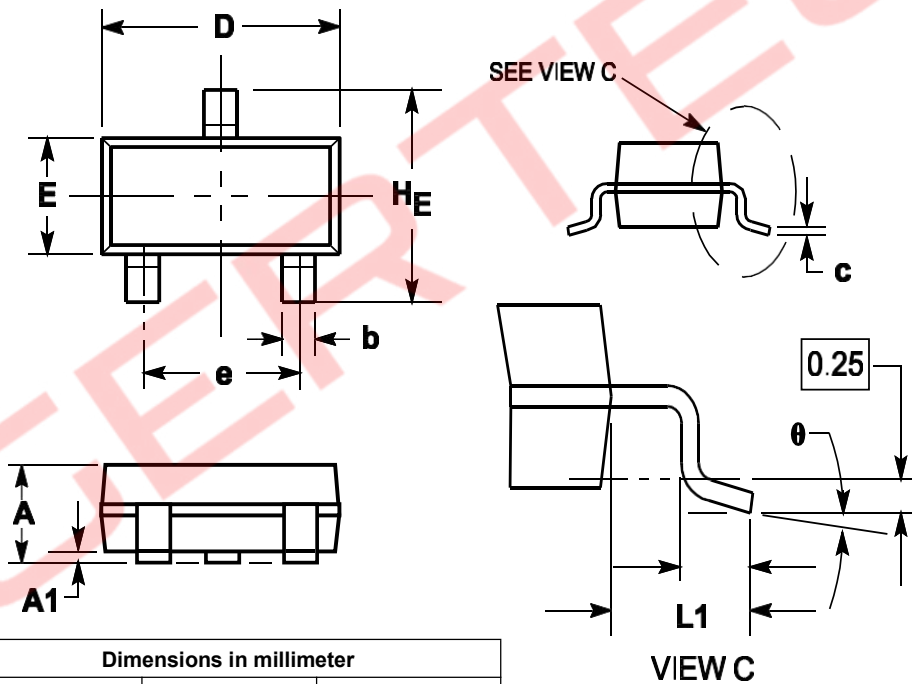


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Package Outline

SOT-23
unit:mm



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.900	1.025	1.150
A1	0.000	0.050	0.100
b	0.300	0.400	0.500
c	0.080	0.115	0.150
D	2.800	2.900	3.000
E	1.200	1.300	1.400
HE	2.250	2.400	2.550
e	1.800	1.900	2.000
L1	0.550REF		
L	0.300		0.500
θ	0°		8°