

/ Descriptions

SOT23-3 P MOS P- CHANNEL MOSFET in a SOT23-3 Plastic Package.

/ Features

$V_{DS}(V) = -30V$

$I_D = -4.2 A (V_{GS} = -10V)$

$R_{DS(ON)} < 60m\Omega (V_{GS} = -10V)$

$R_{DS(ON)} < 65m\Omega (V_{GS} = -4.5V)$

$R_{DS(ON)} < 120m\Omega (V_{GS} = -2.5V)$

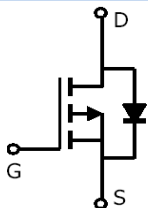
AEC-Q101

Qualified to AEC-Q101 Standards for High

Reliability, HF Product.

/ Applications

This device is suitable for use as a load switch or in PWM applications, Meet the stringent requirements of automotive applications.

/ Equivalent Circuit**/ Pinning****/ Marking**

Marking	QB1H
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/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Drain Current – Continuous	I_D	-4.2	A
Drain Current- Continuous ^A	$I_D(T_a=70^\circ\text{C})$	-3.5	A
Pulsed Drain Current ^B	I_{DM}	-30	A
Gate-Source Voltage	V_{GS}	± 12	V
Total Power Dissipation ^A	P_D	1.4	W
Total Power Dissipation ^A	$P_D(T_a=70^\circ\text{C})$	1.0	W
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	
Maximum Junction-to-Ambient ^A	$R_{\theta JA}(T_a=70^\circ\text{C})$	125	/W
Maximum Junction-to-Lead ^C	$R_{\theta JL}$	60	/W

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V$ $V_{GS}=0V$			-1	μA
		$V_{DS}=-24V$ $V_{GS}=0V$ $T_J=55$			-5	μA
Gate–Body Leakage.	I_{GSS}	$V_{GS}=\pm 12V$ $V_{DS}=0V$			± 0.1	μA
On–State Drain Current	$I_{D(on)}$	$V_{GS}=-4.5V$ $V_{DS}=-5V$	-25			A
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-0.7	-1	-1.3	V
Static Drain–Source On–Resistance	$R_{DS(on)(1)}$	$V_{GS}=-10V$ $I_D=-4.2A$		52	60	m Ω
	$R_{DS(on)(2)}$	$V_{GS}=-10V$ $I_D=-4.2A$ $T_J=125$			75	
	$R_{DS(on)(3)}$	$V_{GS}=-4.5V$ $I_D=-4A$		60	65	
	$R_{DS(on)(4)}$	$V_{GS}=-2.5V$ $I_D=-1A$		75	120	
Forward Transconductance	g_{FS}	$V_{DS}=-5V$ $I_D=-5A$	4	8		S
Drain–Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=-1A$		-0.75	-1.0	V

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	C _{iss}	V _{DS} =-15V V _{GS} =0V f=1MHz		957		pF
Output Capacitance	C _{oss}			115		
Reverse Transfer Capacitance	C _{rss}			77		
Gate resistance	R _g	V _{GS} =0V V _{DS} =0V, f=1MHz		6		Ω
Total Gate Charge	Q _g	V _{GS} =-4.5V V _{DS} =-15V I _D =-4A		9.4		nC
Gate Source Charge	Q _{gs}			2		
Gate Drain Charge	Q _{gd}			3		
Turn-On Delay Time	t _{d(on)}	V _{GS} =-10V R _L =3.6Ω V _{DS} =-15V R _{GEN} =6Ω		6.3		ns
Turn-On Rise Time	t _r			3.2		
Turn-Off Delay Time	t _{d(off)}			38.2		
Turn-Off Fall Time	t _f			12		
Body Diode Reverse Recovery Time	t _{rr}	I _F =-4A, dI/dt=100A/μs		20.2		ns
Body Diode Reverse Recovery Charge	Q _{rr}	I _F =-4A, dI/dt=100A/μs		11.2		nC

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

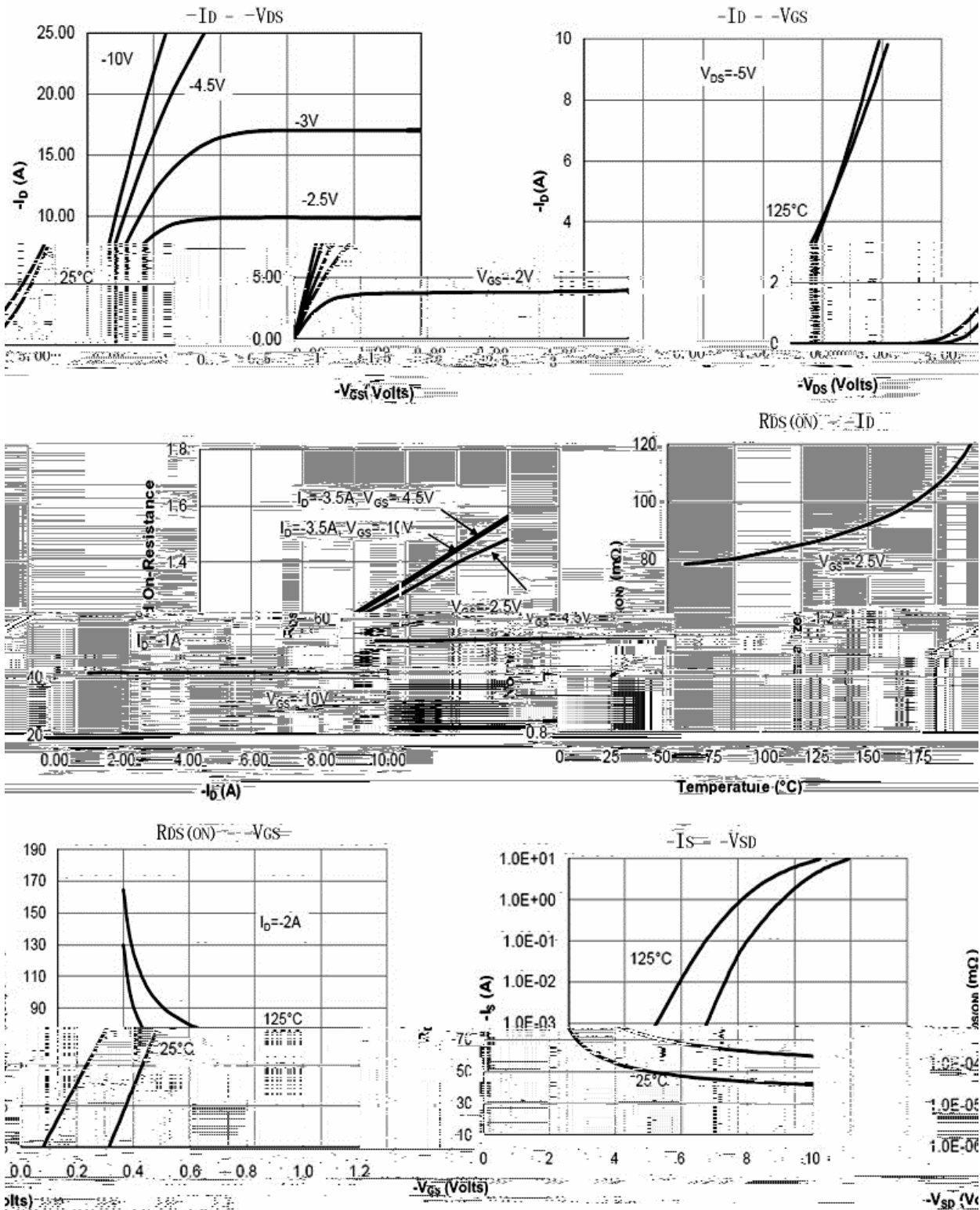
B: Repetitive rating, pulse width limited by junction temperature.

C. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

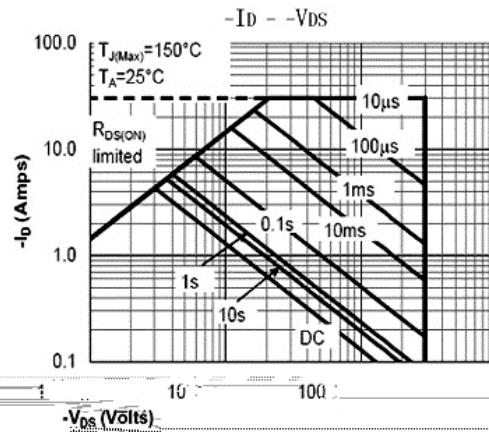
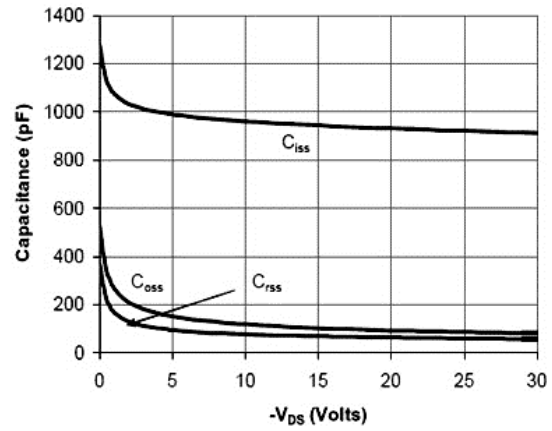
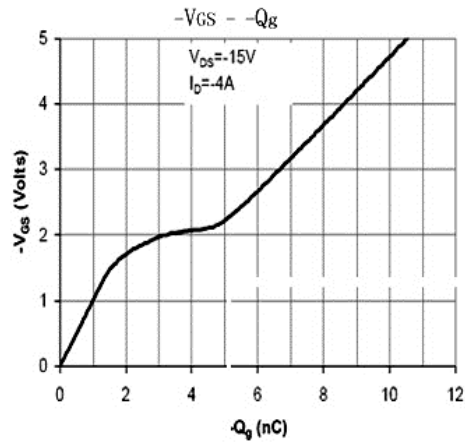
D. The static characteristics in Figures 1 to 6,12,14 are obtained using 80 μs pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

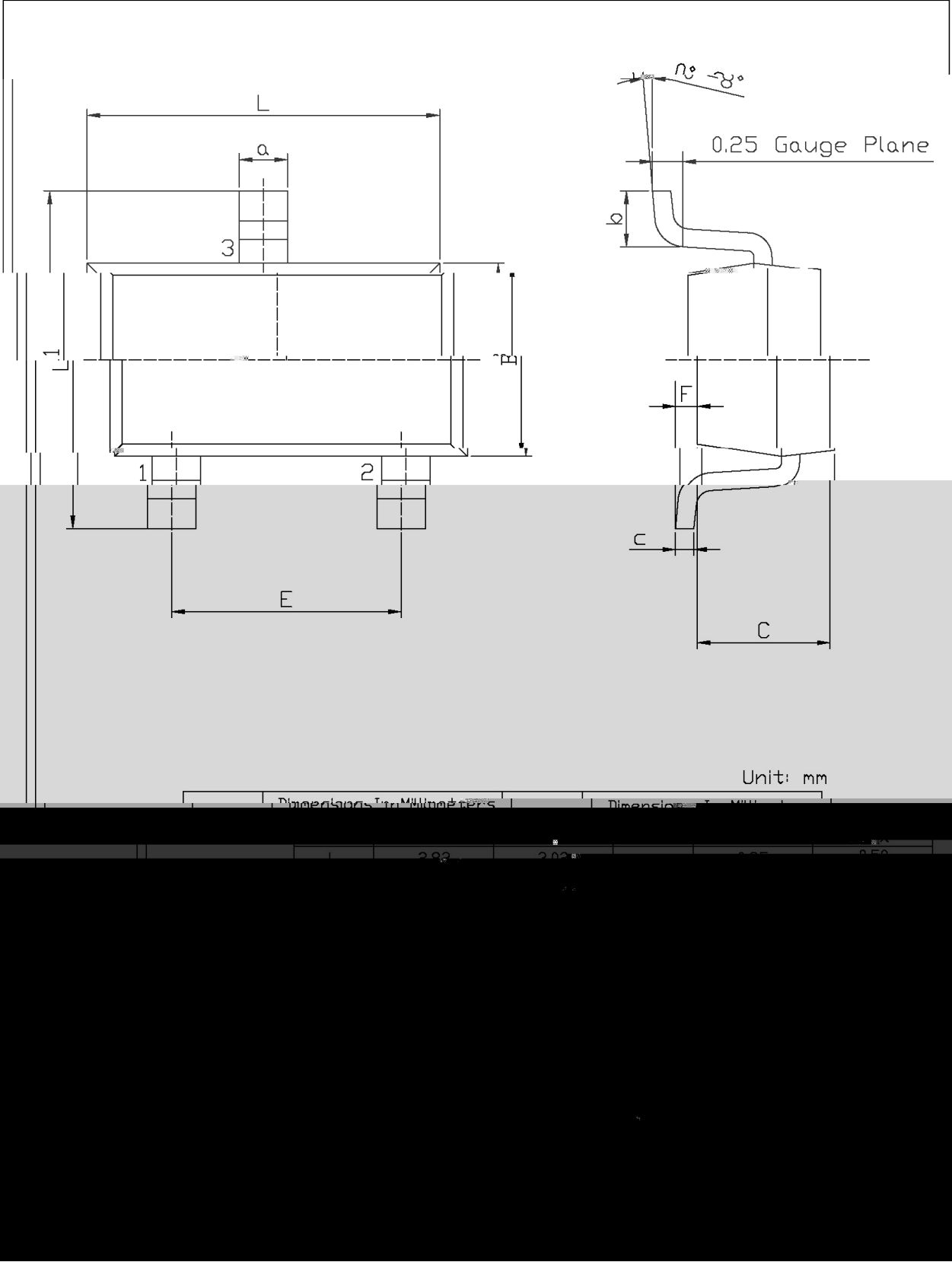
/ Electrical Characteristic Curve



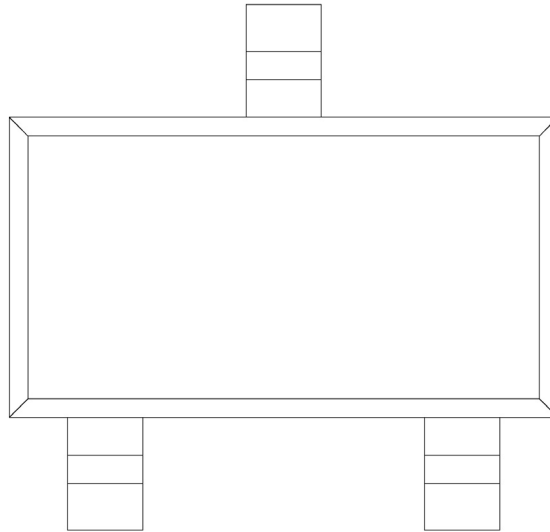
/ Electrical Characteristic Curve



/ Package Dimensions



/ Marking Instructions



Q

B1

H

Note:

Q: Automobile halogen-free product Code

B1: Product Type Code

