/ Descriptions

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

/ Features

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

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

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

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

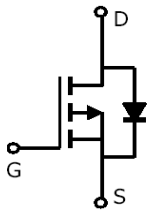
$R_{DS(ON)} < 120m\Omega\ (V_{GS} = -2.5V)$

AEC-Q101 Qualified to AEC-Q101 Standards for High Reliability, HF Product.

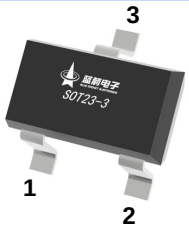
/ Applications

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

/ Equivalent Circuit



/ Pinning



PIN1 G PIN 2 S PIN 3 D

/ Marking

Marking	QB1H

/ 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)	-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)	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)	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=-250μA	-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}=±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=-250μA	-0.7	-1	-1.3	V
Static Drain–Source On–Resistance	$R_{DS(on)(1)}$	V_{GS}=-10V I_D=-4.2A		52	60	mΩ
	$R_{DS(on)(2)}$	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 $R_{\theta JA}$ is measured with the device mounted on $1in^2$ 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.

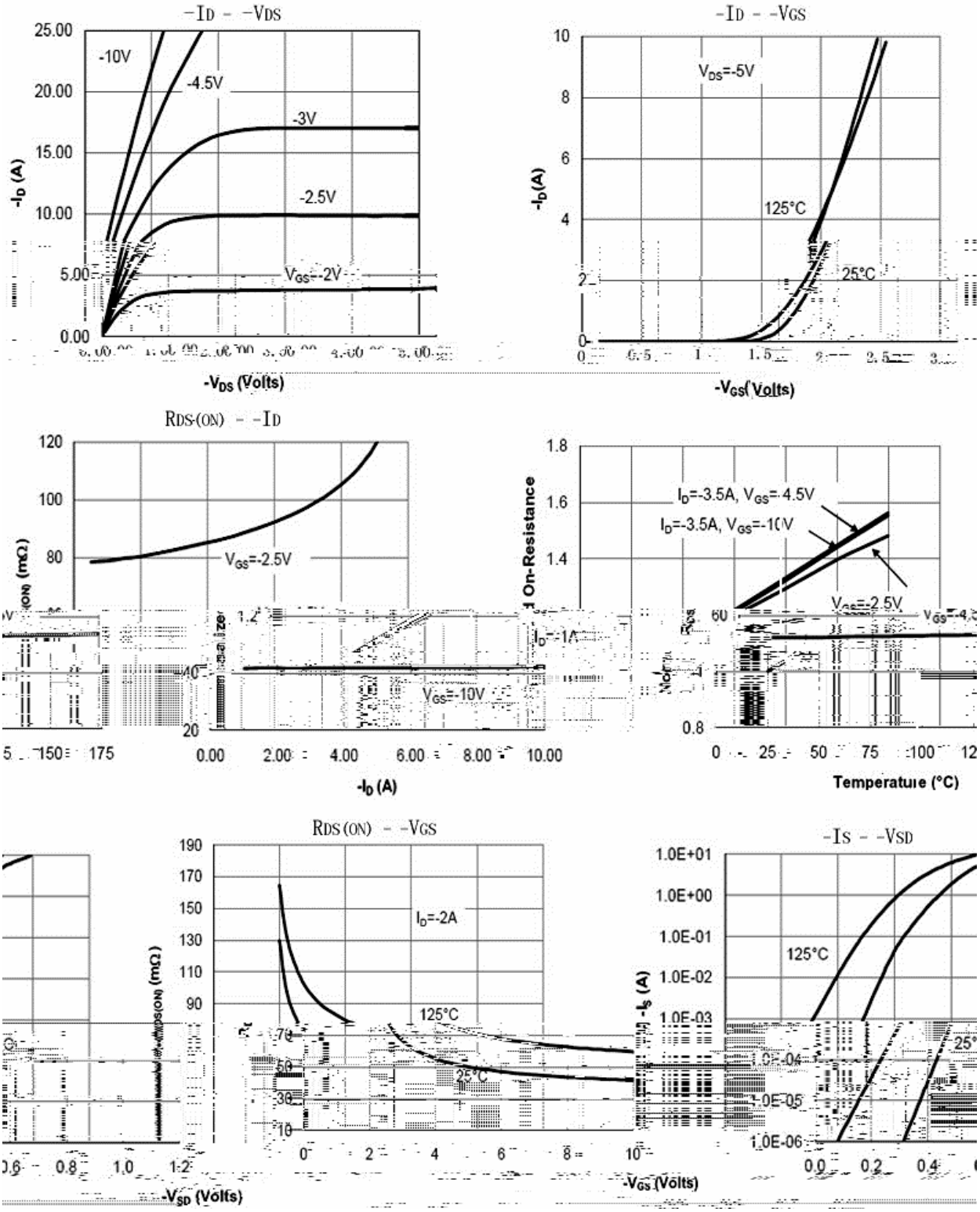
B: Repetitive rating, pulse width limited by junction temperature.

C. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ and lead to ambient.

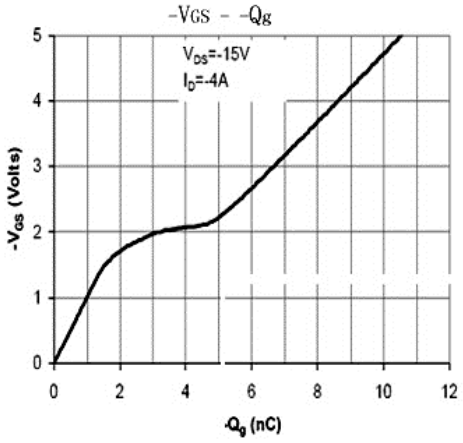
D. The static characteristics in Figures 1 to 6,12,14 are obtained using 80 μs pulses, duty cycle 0.5% max.

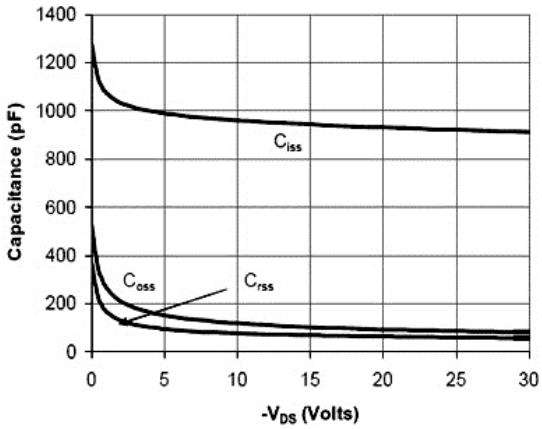
E. These tests are performed with the device mounted on $1 in^2$ FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

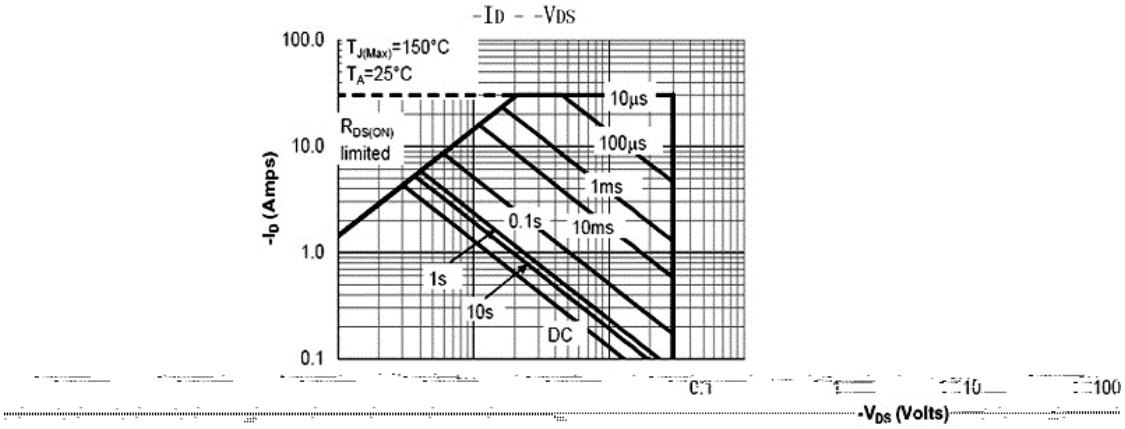
/ Electrical Characteristic Curve



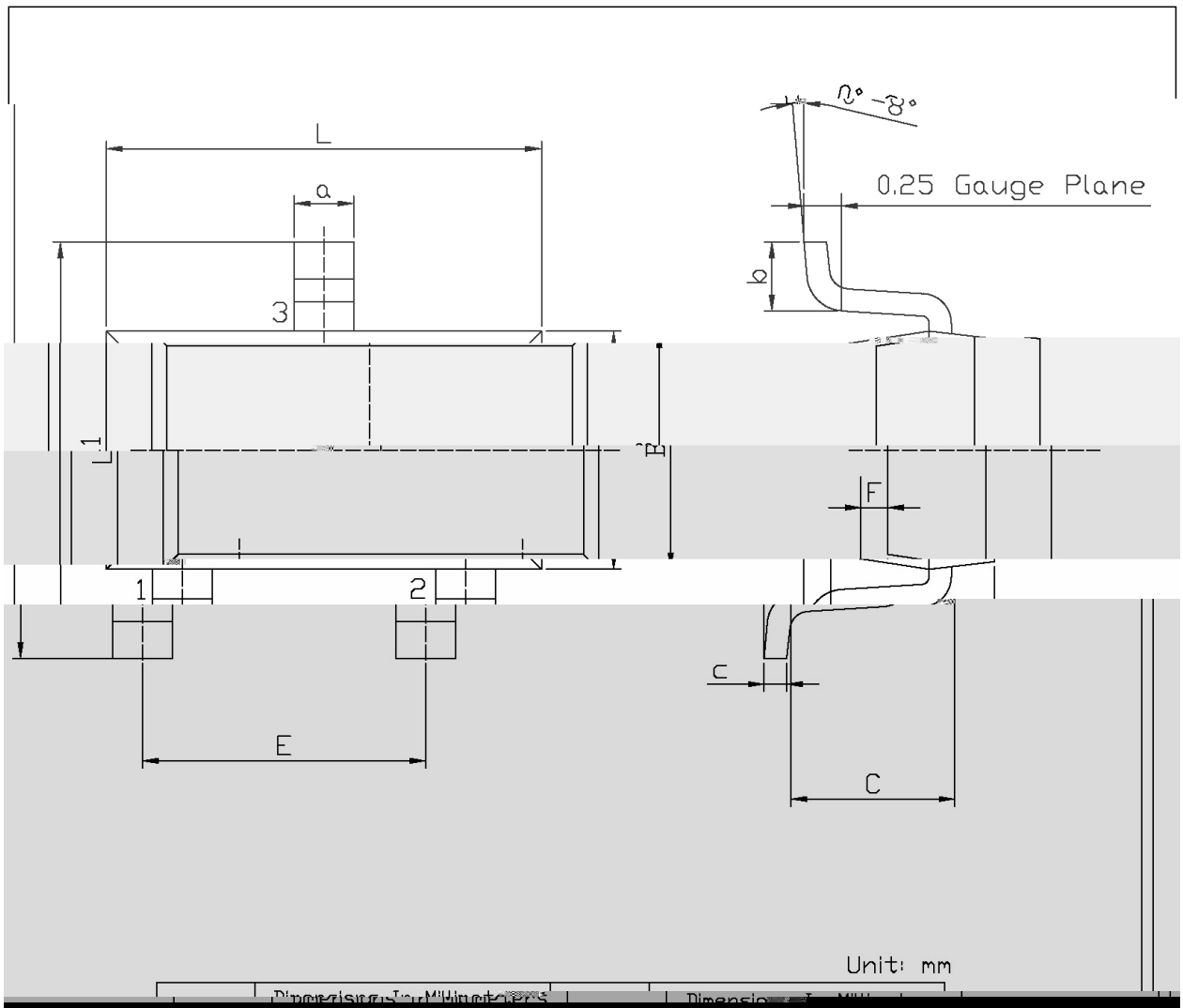
/ Electrical Characteristic Curve



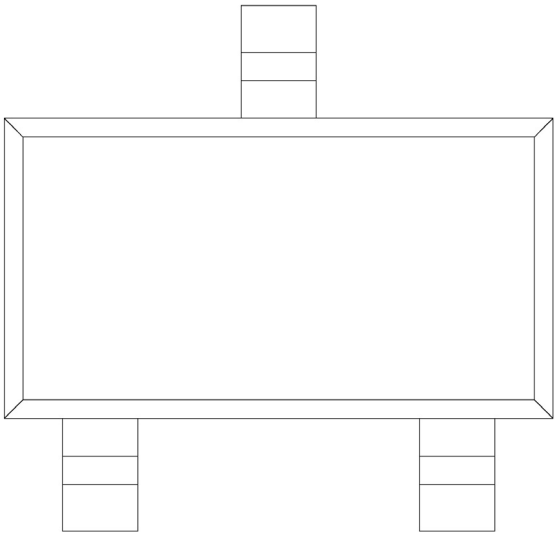




/ Package Dimensions



/ Marking Instructions



Q

B1

H

Note:

Q: Automobile halogen-free product Code

B1: Product Type Code