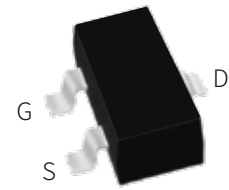


FEATURES

Ultra low on-resistance: $V_{DS}=20V, R_{DS(ON)} \leq 0.25\Omega$

@ $V_{GS}=4.5V, I_D=1.2A$

Surface Mount device



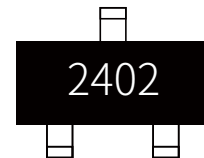
SOT-23

APPLICATION

Case: SOT-23

Case Material: Molded Plastic. UL flammability

Classification Rating: 94V-0

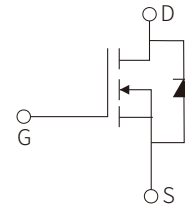


Marking

APPROVALS

RoHS Compliance with 2011/65/EU

HF Compliance with IEC61249-2-21:2003




Schematic Symbol

ABSOLUTE MAXIMUM RATINGS($T_a=25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Drain Current-Continuous	I_D	1.2	A
Drain Current-Continuous	I_D	0.95	A
Pulsed Drain Voltage	I_{DM}	7.4	A
Gate-Source Voltage	V_{GS}	± 12	V
Total Power Dissipation	P_D	540	mW
Peak Dipde Recovery dv/dt(note 2)	dv/dt	5.0	V/ns
Linear Derating Factor		4.3	mW/ $^\circ\text{C}$
Junction-to-Ambient(note 4)	$R_{\theta JA}$	230	$^\circ\text{C}/\text{W}$
Storage temperature	T_{STG}	-55 to 150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS(T_a =25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS} / \Delta T_J$	Reference to 25, I _D =1mA		0.024		V/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1.0	μA
		V _{DS} =16V, V _{GS} =0V, T _J =125°C			25	μA
Gate-to-Source Forward Leakag	I _{GSS}	V _{GS} =±12V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.70			V
Static Drain-Source On-Resistance(Note3)	R _{DS(on)}	V _{GS} =4.5V, I _D =0.93A			0.25	Ω
		V _{GS} =2.7V, I _D =0.47A			0.35	Ω
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =0.47A	1.3			S
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1.0MHz, See Fig.5		110		pF
Output Capacitance	C _{oss}			51		
Reverse Transfer Capacitance	C _{rss}			25		
Turn-On Delay Time	t _{d(on)}	R _D =11Ω, R _G =6.2Ω V _{DD} =10V, I _D =0.93A		2.5		ns
Turn-On Rise Time	t _r			9.5		
Turn-Off Delay Time	t _{d(off)}			9.7		
Turn-Off Fall Time	t _f			4.8		
Diode forward voltage (note 2)	V _{SD}	I _S =0.93A, V _{GS} =0V, T _J =25°C			1.2	V
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =16V, I _D =0.93A		2.6	3.9	nC
Gate Source Charge	Q _{gs}			0.41	0.62	
Gate Drain Charge(note 2)	Q _{gd}			1.1	1.7	
Diode forward current(Body Diode)	I _S	MOSFET symbol showing the integral rever p-n junction diod 			0.54	A
Pulsed Source Curren (Body Diode)(note 1)	I _{SM}				7.4	
Reverse Recovery Time	t _{rr}	I _F =0.93A di/dt=100A/us, T _J =25°C		25	38	ns
Reverse Recovery Charge(note 3)	Q _{rr}			16	24	nC

Note:1. Repetitive rating; pulse width limited by max. junction temperature

Note:2. I_{SD} ≤ 0.93A, di/dt ≤ 90A/us, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C

Note:3. Pulse width ≤ 300μs, Duty cycle ≤ 2%

Note:4. Surface mounted on FR-4 board t ≤ 5sec

PARAMETER CHARACTERISTIC CURVE

Fig 1: Typical Output Characteristics

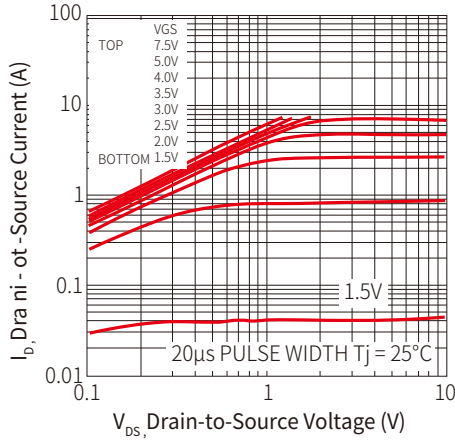


Figure 2: Typical Output Characteristics

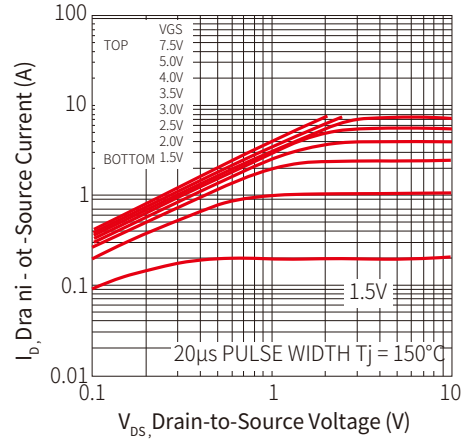


Figure 3: Typical Transfer Characteristics

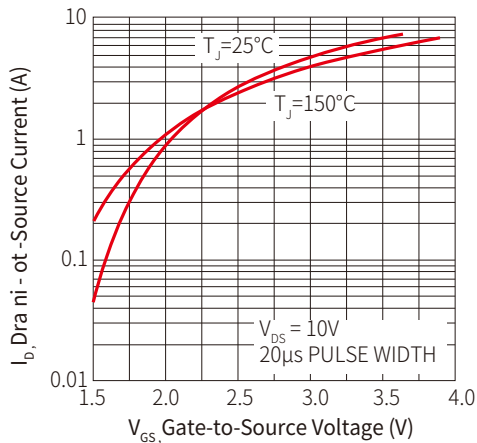


Figure 4: Normalized On-Resistance Vs. Temperature

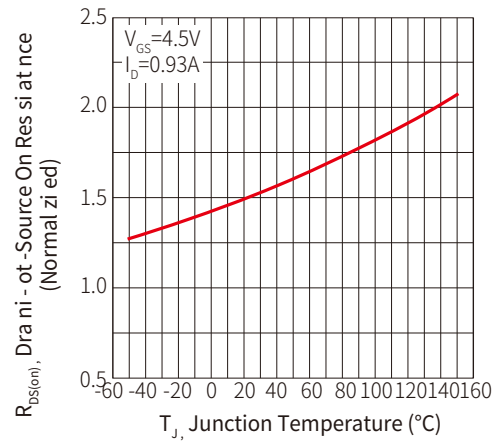


Figure 5: Typical Capacitance Vs. Drain-to-Source Voltage

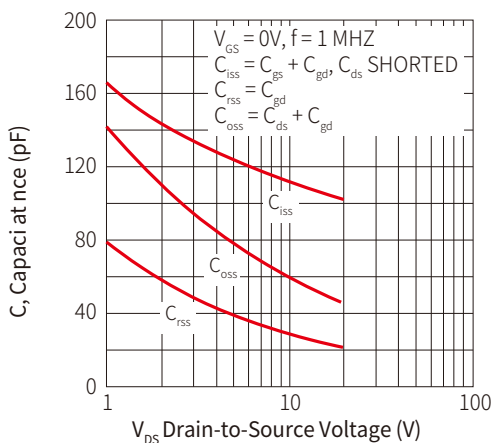


Figure 6: Typical Gate Charge Vs. Gate-to-Source Voltage

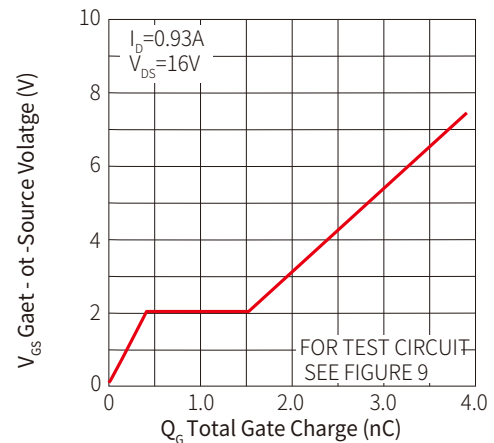


Figure 7: Typical Source-Drain Diode Forward Voltage

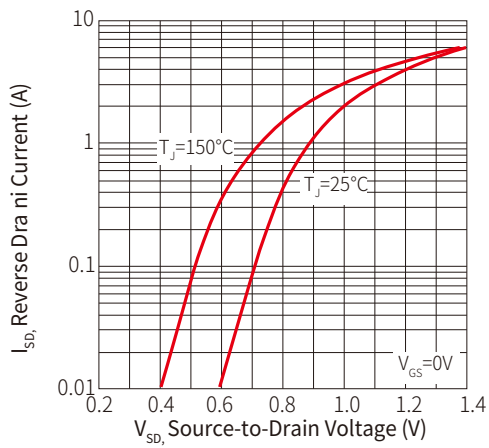


Figure 8: Maximum Safe Operating Area

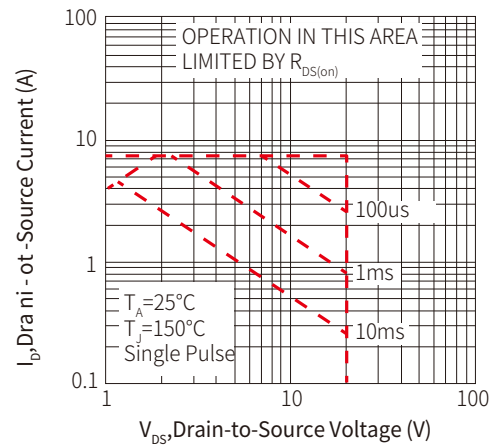


Figure 9: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

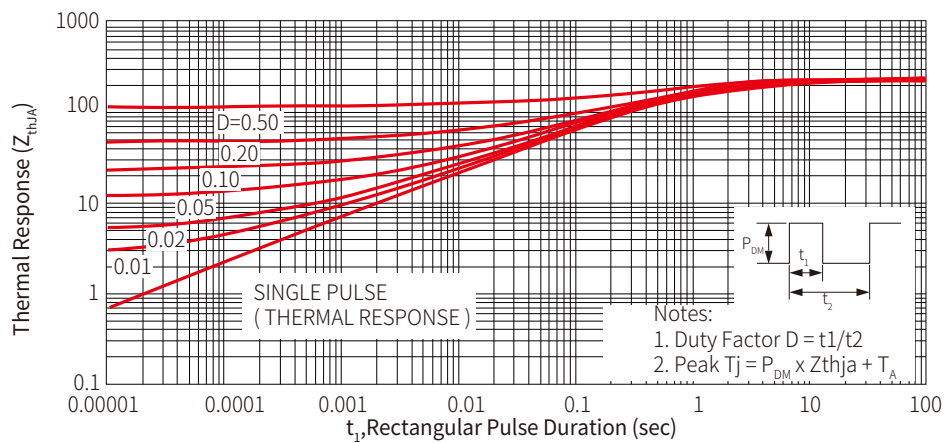


Figure 10: Switching Time Test Circuit & Waveforms

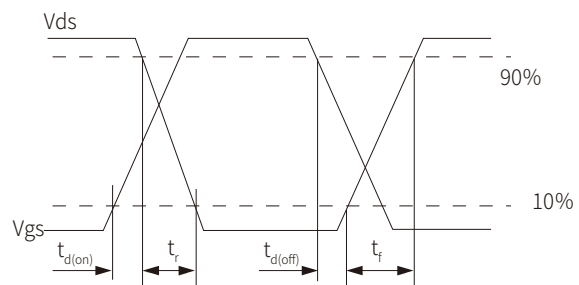
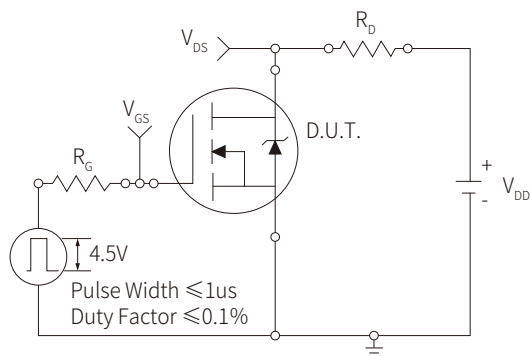


Figure 11: Basic Gate Charge Waveform & Test Circuit

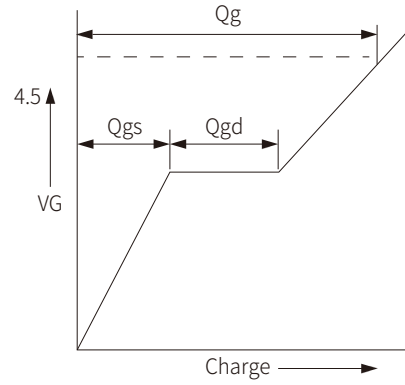
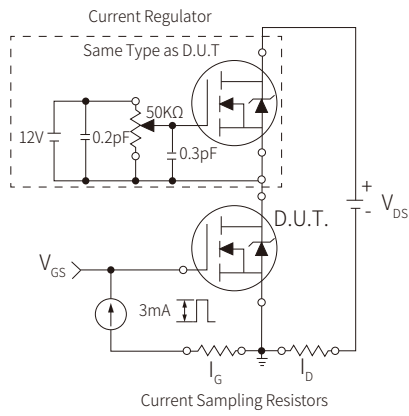
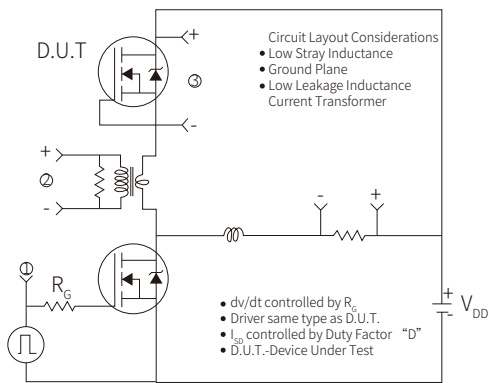
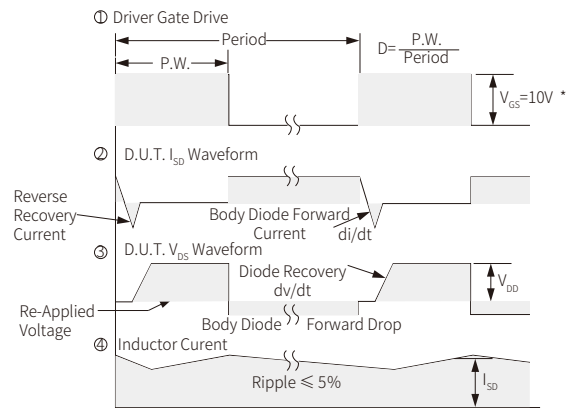


Figure 12: For N-Channel HEXFETS

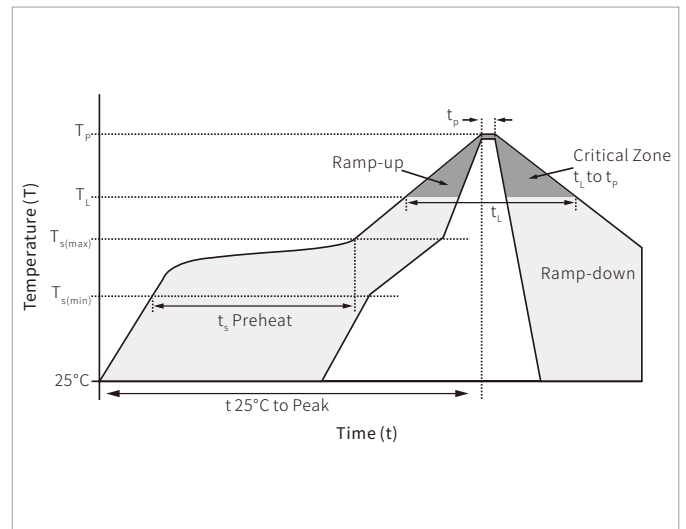


* $V_{GS}=5V$ for Logic Level Devices

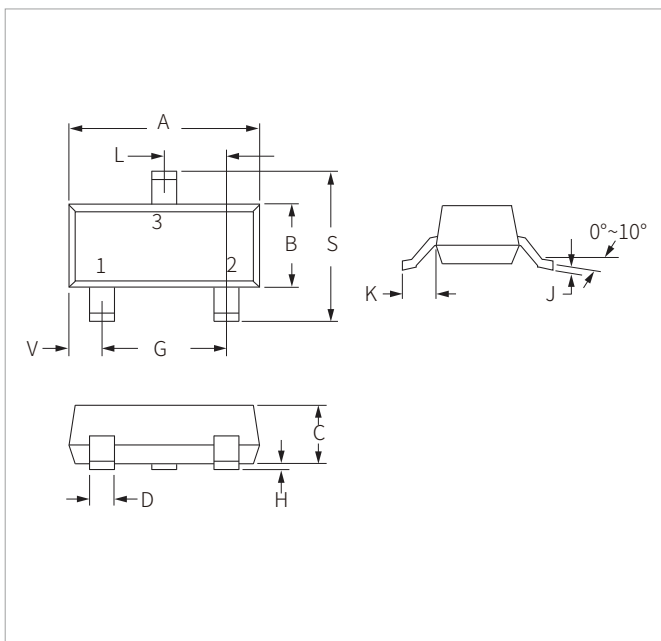


SOLDERING PARAMETERS

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_r)	60 – 150 seconds
Peak Temperature (T_p)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260°C

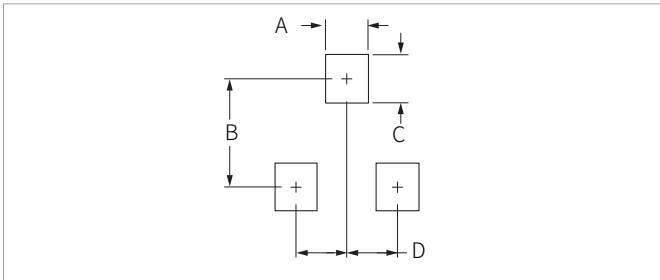


SOT-23 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.80	3.05	0.110	0.120
B	1.20	1.40	0.047	0.055
C	0.90	1.15	0.035	0.045
D	0.37	0.50	0.015	0.020
G	1.75	2.05	0.069	0.081
H	0.01	0.100	0.001	0.004
J	0.085	0.180	0.003	0.007
K	0.35	0.69	0.014	0.029
L	0.89	1.02	0.035	0.040
S	2.10	2.65	0.083	0.104
V	0.45	0.60	0.018	0.024

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.71	0.97	0.028	0.038
B	1.88	2.13	0.074	0.084
C	0.71	0.97	0.028	0.038
D	0.81	1.07	0.032	0.042

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SNM2402S	SOT-23	3000PCS	7"

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By QR Code

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