M02N601D1

600V N-Channel General Purpose Switching Device Applications

■ Features

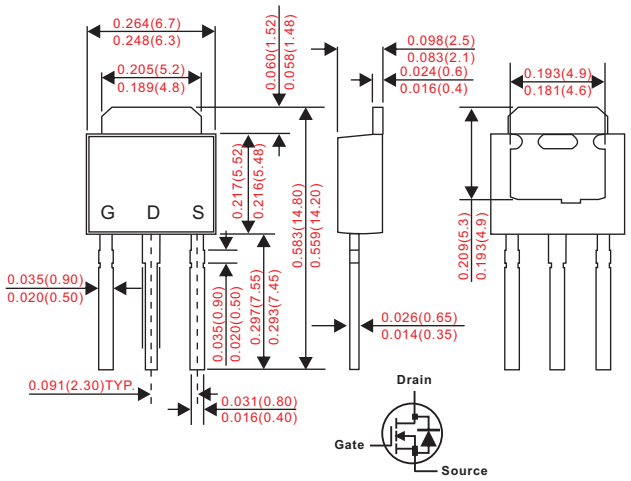
- 600V, 2.0A, $R_{DS(on)}$ = maximum 5Ω@V_{GS} = 10V.
- 100% avalanche, EAS tested.
- Suffix "G" indicates Halogen-free part, ex.M02N601D1G.

■ Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : JEDEC TO-251 molded plastic body over passivated chip
- Lead : Axial leads, solderable per MIL-STD-202, Method 208 guranteed.

■ Outline

TO-251



Dimensions in inches and (millimeters)

■ Maximum ratings

Rating at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

PARAMETER	CONDITIONS	Symbol	M02N601D1	UNIT
Drain to source voltage		V_{DSS}	600	V
Gate-source voltage		V_{GSS}	±30	
Drain current-continue		I_D	2	A
-pulsed	PW < 10us, duty cycle < 1%	I_{DP}	8	
Allowable power disspipation	T_C = 25°C	P_D	31	W
	Derate above25°C		0.25	W/°C
Channel temperature		T_{CH}	150	°C
Storage thermal		T_{STG}	-55 ~ +150	°C
Avalanche current(2)		I_{AV}	2	A
Avalanche energy(single pulse)(1)		E_{AS}	61	mJ

Note: 1.V_{DD} = 50V, L = 20mH, I_{AV} = 2A, R_G = 25Ω.
2.Repetitive rating : pulse width limited by maximum junction temperature.

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■ Electrical characteristics

(AT T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Drain-to-source breakdown voltage	I_D = 250uA, V_{GS} = 0V	$V_{(BR)DSS}$	600			V
Zero-gate voltage drain current	V_{DS} = 600V, V_{GS} = 0V	I_{DSS}			10	uA
Gate-to-source leakage current	V_{GS} = ±30V, V_{DS} = 0V	I_{GSS}			±100	nA
Cutoff voltage	V_{DS} = V_{GS}, I_D = 250uA	$V_{GS(off)}$	2		4	V
Forward transfer admittance	V_{DS} = 40V, I_D = 1.0A	$\|Y_{fs}\|$		1.0		S
Static drain-to-source on-state resistance	I_D = 1.0A, V_{GS} = 10V	$R_{DS(on)}$		4.0	5.0	Ω
Input capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	C_{iss}		356		pF
Output capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	C_{oss}		31		pF
Reverse transfer capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	C_{rss}		4.0		pF
Total gate charge	V_{DS} = 480V, I_D = 2.0A, V_{GS} = 10V	Q_G		9.5		nC
Gate source charge		Q_{GS}		2.3		
Gate drain charge		Q_{GD}		4.7		
Turn-on delay time	V_{GS} = 10V, V_{DD} = 300V, I_D = 2.0A R_{GS} = 25Ω	$t_{d(on)}$		11.5		ns
Rise time		t_r		14.3		
Turn-off delay time		$t_{d(off)}$		23		
Fail time		t_f		8.3		
Diode forward voltage	I_S = 1.0A, V_{GS} = 0V	V_{SD}			1.4	V

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■ Rating and characteristic curves

Fig 1.ON-REGION CHARACTERISTICS

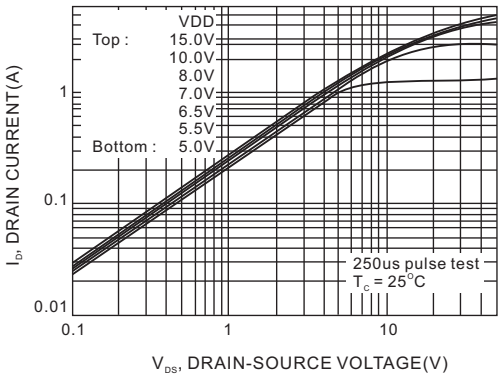


Fig 2.TRANSFER CHARACTERISTICS

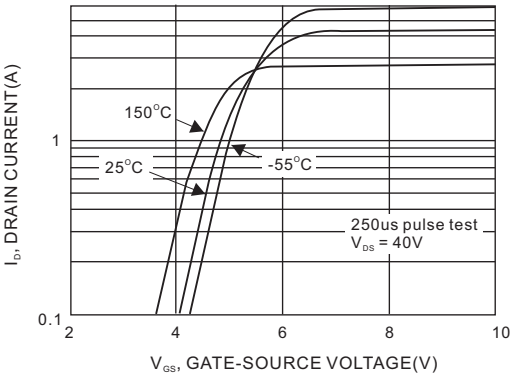


Fig 3.ON-RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

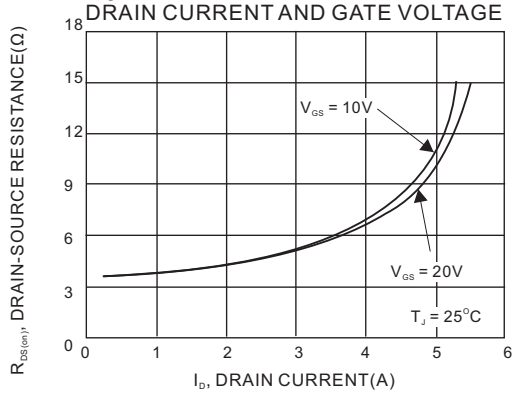


Fig 4.BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

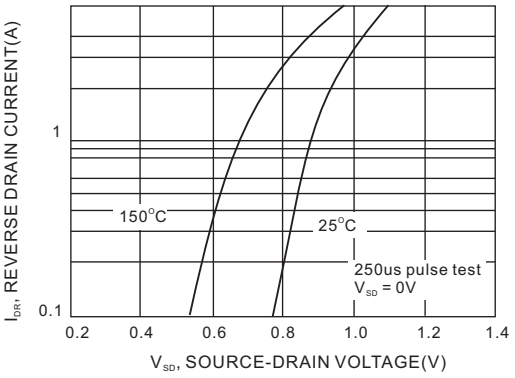


Fig 5.CAPACITANCE CHARACTERISTICS

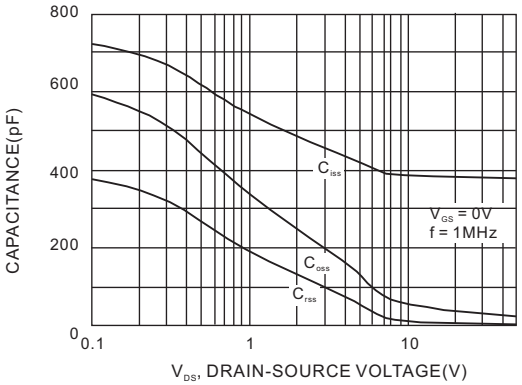
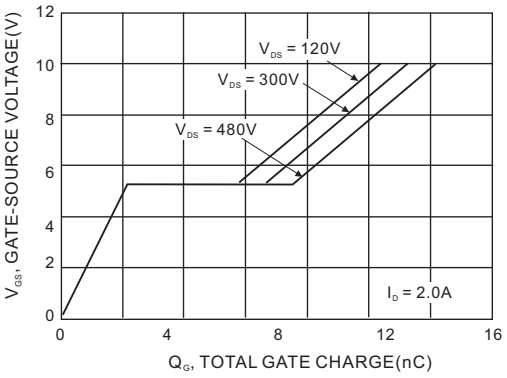


Fig 6.GATE CHARGE CHARACTERISTICS



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■ Rating and characteristic curves

Fig 7.BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

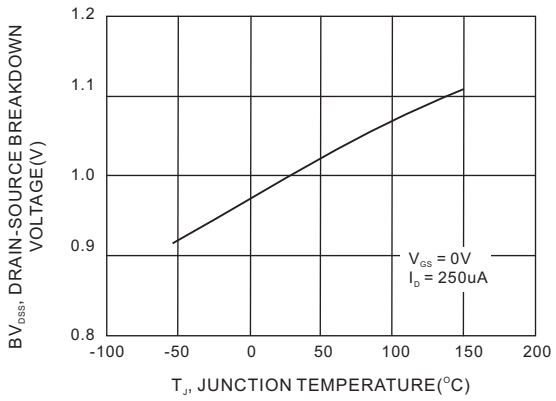


Fig 8.ON-RESISTANCE VARIATION

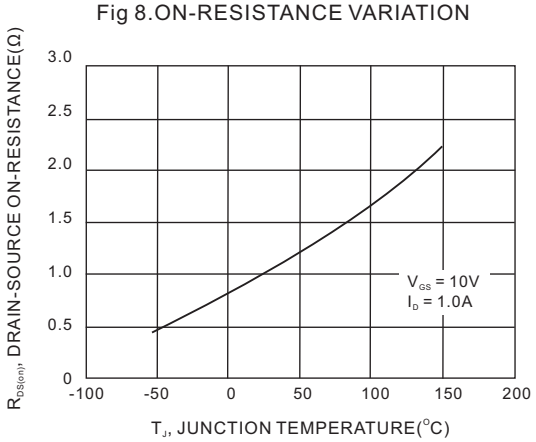


Fig 9.MAXIMUM SAFE OPERATING AREA FOR M02N601D1

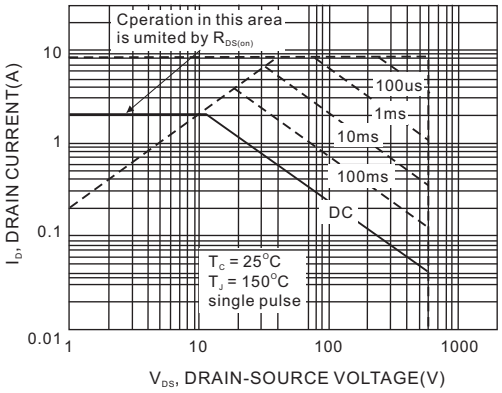


Fig 10.MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

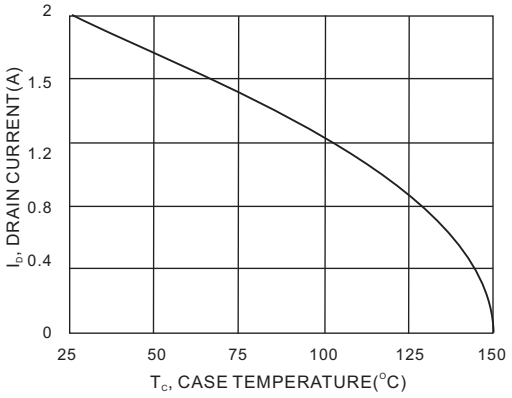
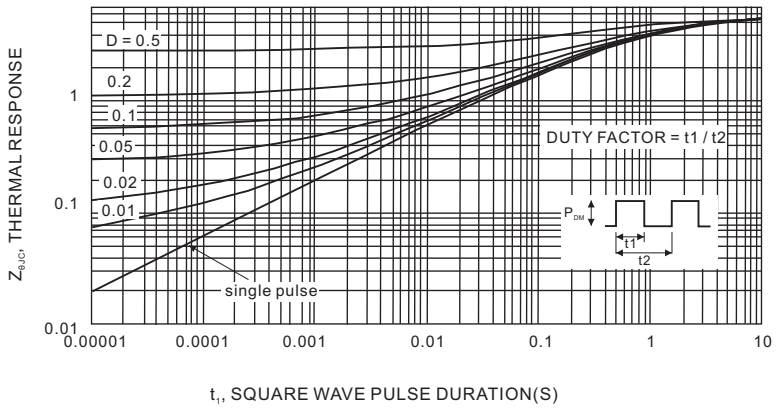


Fig 11.THRNSIENT THERMAL RESPONSE CURVE FOR M02N601D1



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