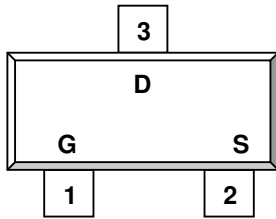


PIN CONFIGURATION
SOT-23

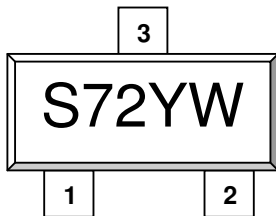


1.Gate 2.Source 3.Drain

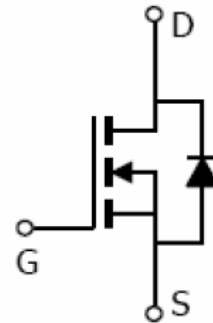
FEATURE

- 60V/0.30A, $R_{DS(ON)} = 5\Omega$ @ $V_{GS} = 10V$ (Typ.)
- 60V/0.25A, $R_{DS(ON)} = 7\Omega$ @ $V_{GS} = 4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and Maximum DC current capability
- SOT-23 package design

PART MARKING
SOT-23



Y : Year Code W : Process Code





2N7002 

N Channel Enhancement Mode MOSFET

300mA

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	60	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (T _J =150°C)	I _D	0.3	A
	T _A =25°C		
Pulsed Drain Current	I _{DM}	1.0	A
Power Dissipation	P _D	0.35	W
	T _A =25°C		
Operation Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Ambient	R _{θJA}	375	°C/W



2N7002 

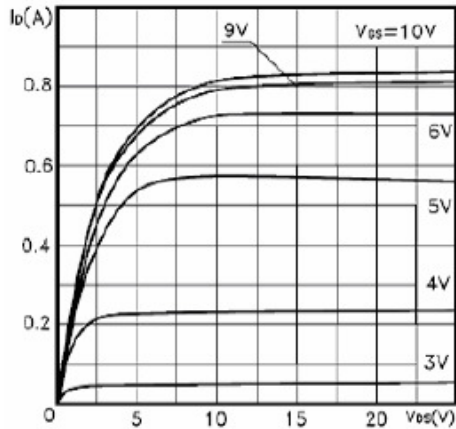
N Channel Enhancement Mode MOSFET

300mA

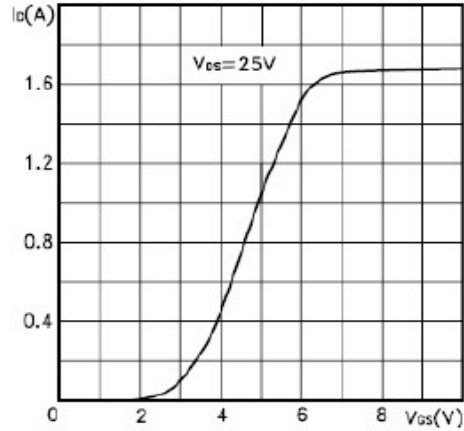
ELECTRICAL CHARACTERISTICS (Ta = 25°C Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D= 250\mu A$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D= 250\mu A$	0.8		2.5	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}= 45V, V_{GS}=0V$			1	uA
		$V_{DS}= 45V, V_{GS}=0V$ $T_J=125^\circ C$			10	
On-State Drain Current	$I_{SD(on)}$				0.35	A
On-State Drain Current (pulsed)	$I_{SDM(2)}$				1.4	
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=10.0V, I_D=0.50A$		2.50	6.0	Ω
		$V_{GS}=4.5V, I_D= 0.25A$		3.30	7.0	
Forward Transconductance	$G_{fs(1)}$	$V_{DS}=10V, I_D= 0.5A$		0.6		S
Diode Forward Voltage	$V_{SD(1)}$	$I_S=0.12A, V_{GS}=0V$		0.85	1.5	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=30V, V_{GS}=4.5V$ $I_D= 1.0A$		1.4	2.0	nC
Gate-Source Charge	Q_{gs}			0.8		
Gate-Drain Charge	Q_{gd}			0.5		
Input Capacitance	C_{iss}	$V_{DS}=25V, f=1MHz,$ $V_{GS}=0$		43		pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			6		
Turn-On Time	$t_{d(on)tr}$	$V_{DD}=30V$ $I_D=0.5A$ $V_{GS}=4.5V$ $R_G=4.7\Omega$		6		nS
				15		
Turn-Off Time	$t_{d(off)tf}$			6	13	
				7	9	

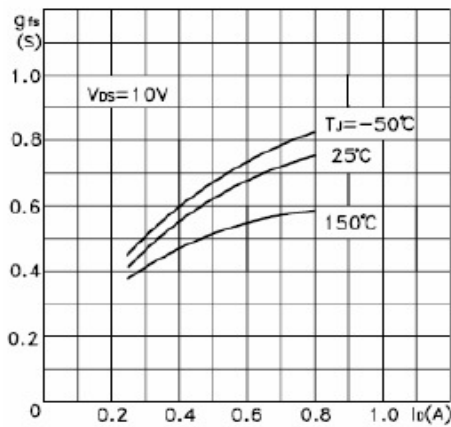
TYPICAL CHARACTERISTICS (25°C Unless noted)



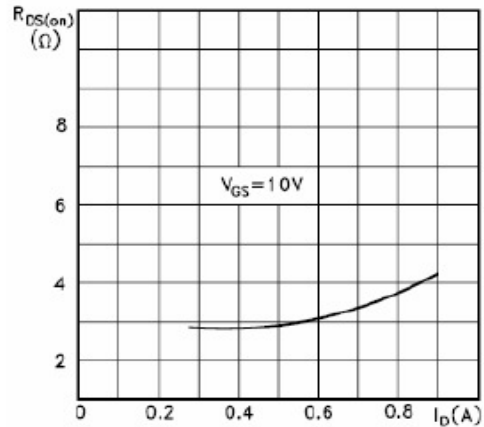
Output Characteristics



Transfer Characteristics

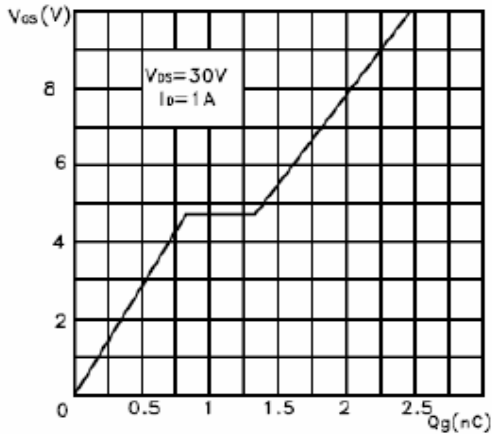


Transconductance

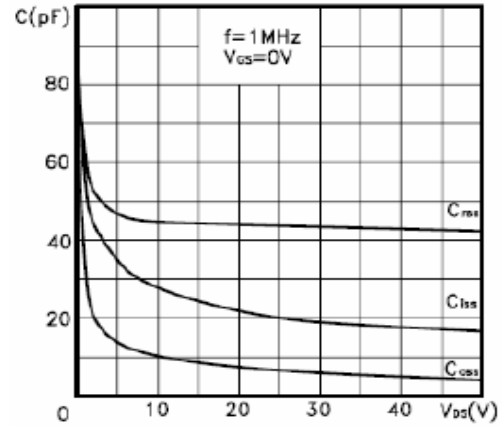


Static Drain-source On Resistance

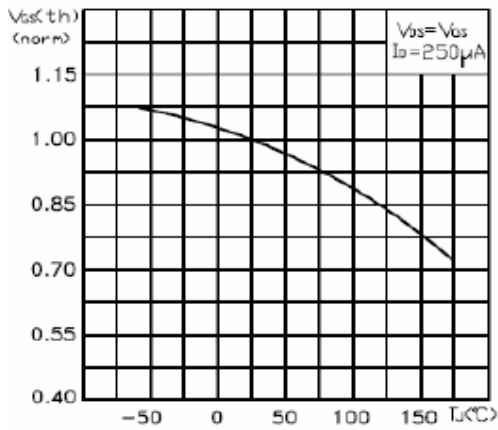
TYPICAL CHARACTERISTICS



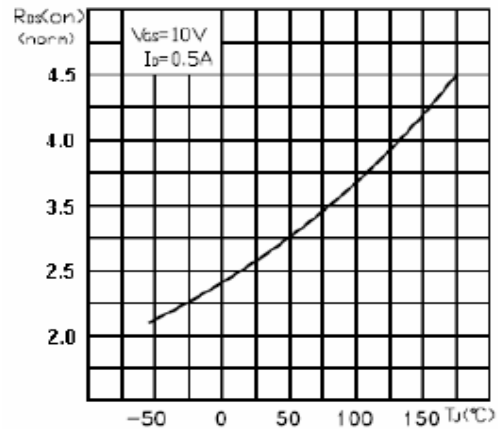
Gate Charge vs Gate-source Voltage



Capacitance Variations

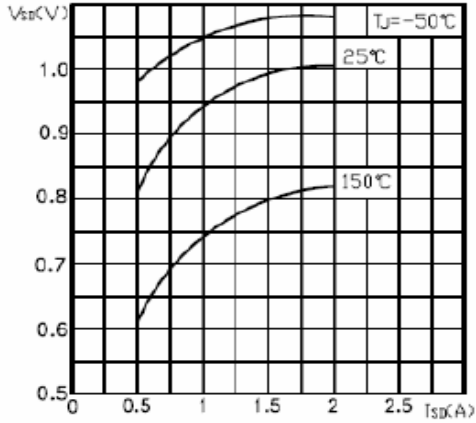


Normalized Gate Threshold Voltage vs Temperature

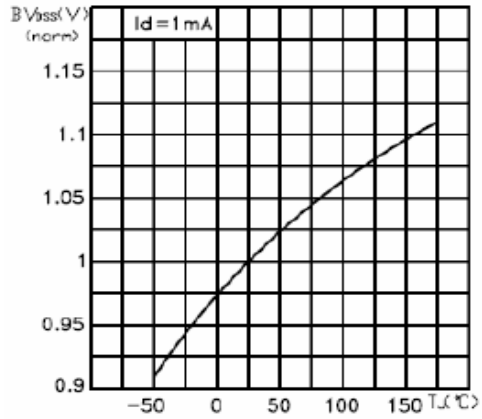


Normalized On Resistance vs Temperature

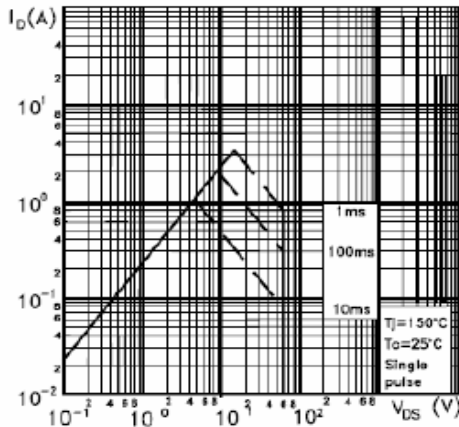
TYPICAL CHARACTERISTICS



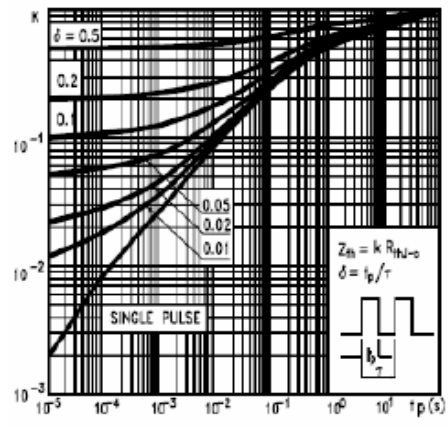
Source-Drain Forward



Normalized BVDSS vs Temperature

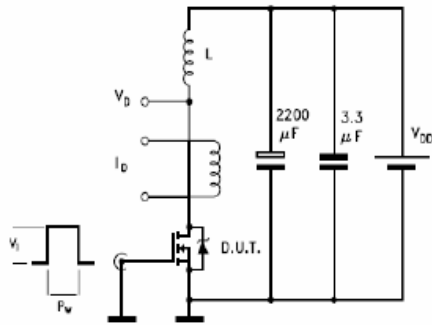


Safe Operating Area

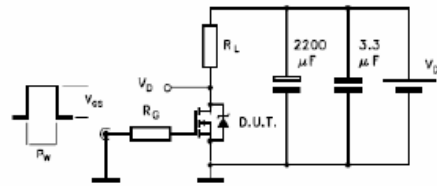


Thermal Impedance

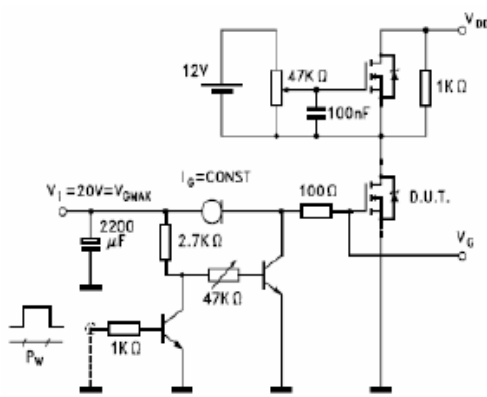
TIPYCAL TESTING CIRCUIT



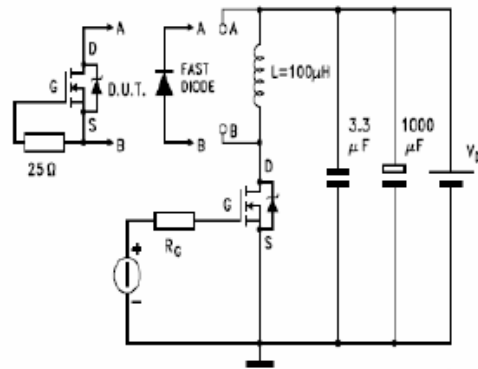
Unclamped Inductive Load Test



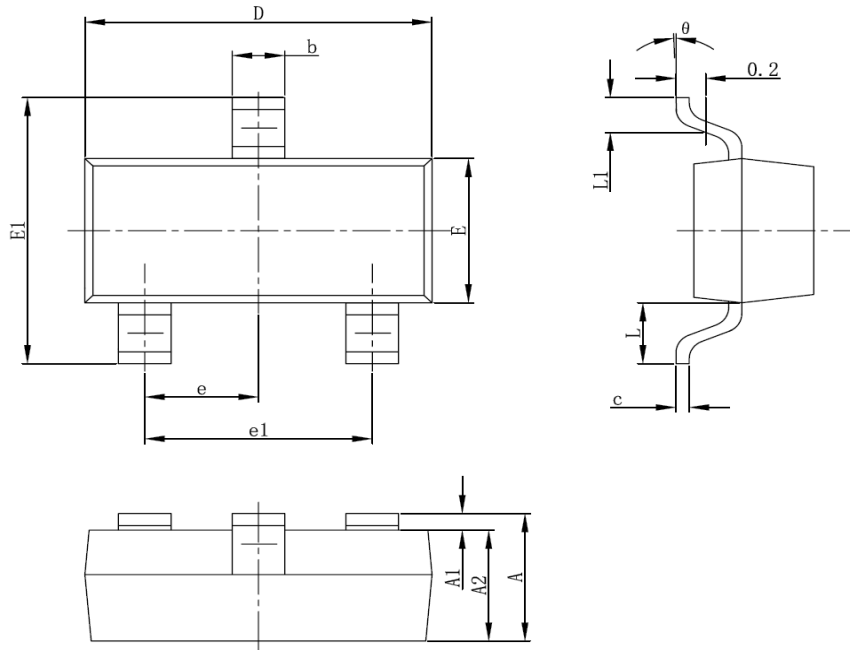
Switching Times Test Circuit



Gate Charge Test Circuit



Test Circuit For Inductive Load Switching and Diode Recovery Times

SOT-23 PACKAGE OUTLINE


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	8°

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