

Small Signal MOSFET

300 mAmps, 60 Volts

N-Channel SOT23-6

- We declare that the material of product compliance with RoHS requirements.
- ESD Protected:1000V
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V _{dc}
Drain-Gate Voltage ($R_{GS} = 1.0\text{ M}\Omega$)	V_{DGR}	60	V _{dc}
Drain Current <ul style="list-style-type: none">- Continuous $T_C = 25^\circ\text{C}$ (Note 1.)$T_C = 100^\circ\text{C}$ (Note 1.)- Pulsed (Note 2.)	I_D I_D I_{DM}	± 300 ± 75 ± 800	mAdc
Gate-Source Voltage <ul style="list-style-type: none">- Continuous- Non-repetitive ($t_p \leq 50\text{ }\mu\text{s}$)	V_{GS} V_{GSM}	± 20 ± 40	V _{dc} V _{pk}

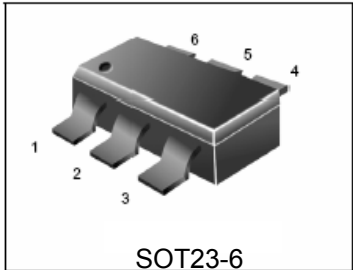
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 3.) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate, (Note 4.) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.
3. FR-5 = $1.0 \times 0.75 \times 0.062\text{ in.}$
4. Alumina = $0.4 \times 0.3 \times 0.025\text{ in}$ 99.5% alumina.

ORDERING INFORMATION

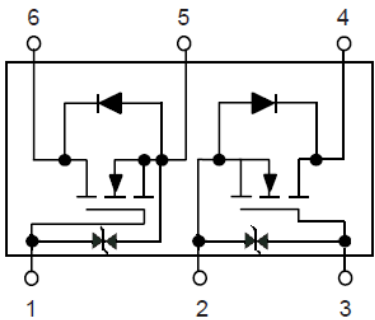
Device	Marking	Shipping
HM7002KDM	72D	3000 Tape & Reel
HM7002KDM	72D	10000 Tape & Reel



300 mAMPS
60 VOLTS

$R_{DS(on)} = 1.8\text{ }\Omega$

N - Channel



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage ($V_{GS} = 0$, $I_D = 250\mu\text{A}$)	$V_{(BR)DSS}$	60	—	—	Vdc
Zero Gate Voltage Drain Current ($V_{GS} = 0$, $V_{DS} = 60\text{ Vdc}$)	I_{DSS}	$T_J = 25^\circ\text{C}$	—	1.0	μA
		$T_J = 125^\circ\text{C}$	—	500	μA
Gate-Body Leakage Current, Forward ($V_{GS} = 20\text{ Vdc}$)	I_{GSSF}	—	—	1.0	μA
Gate-Body Leakage Current, Reverse ($V_{GS} = -20\text{ Vdc}$)	I_{GSSR}	—	—	-1.0	μA

ON CHARACTERISTICS (Note 2.)

Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$)	$V_{GS(th)}$	0.7	1.3	1.9	Vdc
On-State Drain Current ($V_{DS} \geq 2.0 V_{DS(on)}$, $V_{GS} = 10\text{ Vdc}$)	$I_{D(on)}$	500	—	—	mA
Static Drain-Source On-State Voltage ($V_{GS} = 10\text{ Vdc}$, $I_D = 500\text{ mA}$) ($V_{GS} = 5.0\text{ Vdc}$, $I_D = 50\text{ mA}$)	$V_{DS(on)}$	—	—	3.75	Vdc
		—	—	0.375	
Static Drain-Source On-State Resistance ($V_{GS} = 10\text{ V}$, $I_D = 500\text{ mA}$) $T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ ($V_{GS} = 5.0\text{ Vdc}$, $I_D = 50\text{ mA}$) $T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	$r_{DS(on)}$	—	1.8	2.2	Ohms
		—	—	4.4	
		—	1.95	3.0	
		—	—	6.0	
Forward Transconductance ($V_{DS} \geq 2.0 V_{DS(on)}$, $I_D = 200\text{ mA}$)	g_{FS}	80	—	—	mmhos

DYNAMIC CHARACTERISTICS

Input Capacitance ($V_{DS} = 25\text{ Vdc}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$)	C_{iss}	—	17	50	pF
Output Capacitance ($V_{DS} = 25\text{ Vdc}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$)	C_{oss}	—	10	25	pF
Reverse Transfer Capacitance ($V_{DS} = 25\text{ Vdc}$, $V_{GS} = 0$, $f = 1.0\text{ MHz}$)	C_{rss}	—	2.5	5.0	pF

SWITCHING CHARACTERISTICS (Note 2.)

Turn-On Delay Time	$(V_{DD} = 25\text{ Vdc}$, $I_D \cong 500\text{ mA}$, $R_G = 25\Omega$, $R_L = 50\Omega$, $V_{gen} = 10\text{ V}$)	$t_{d(on)}$	—	7	20	ns
Turn-Off Delay Time		$t_{d(off)}$	—	11	40	ns

BODY-DRAIN DIODE RATINGS

Diode Forward On-Voltage ($I_S = 300\text{ mA}$, $V_{GS} = 0\text{ V}$)	V_{SD}	—	—	-1.5	Vdc
Source Current Continuous (Body Diode)	I_S	—	—	-300	mA
Source Current Pulsed	I_{SM}	—	—	-900	mA

2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

TYPICAL ELECTRICAL CHARACTERISTICS

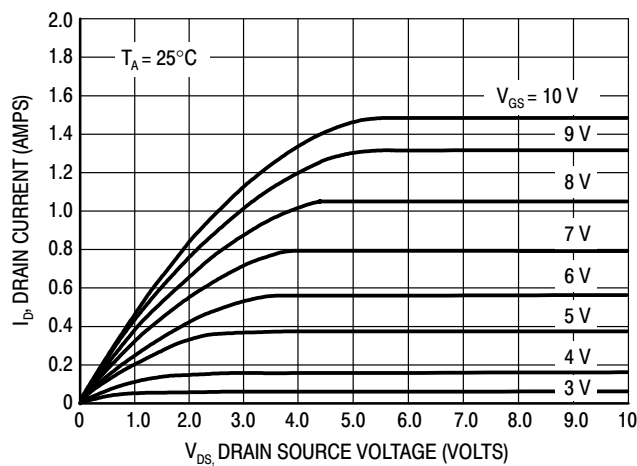


Figure 1. Ohmic Region

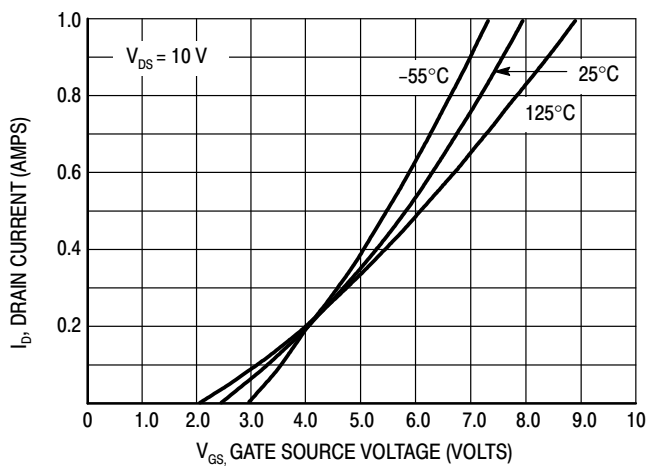


Figure 2. Transfer Characteristics

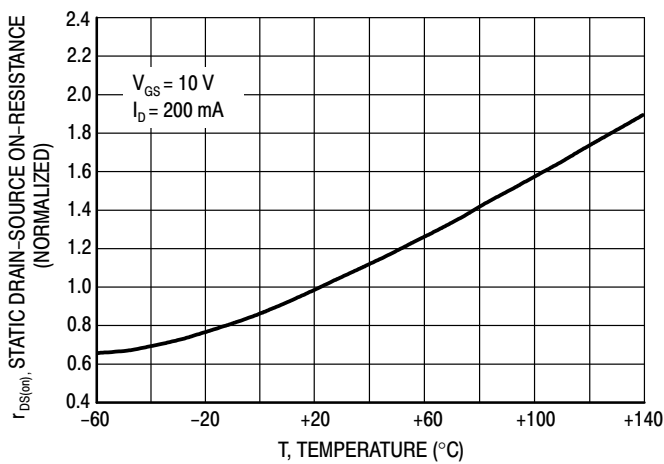


Figure 3. Temperature versus Static Drain-Source On-Resistance

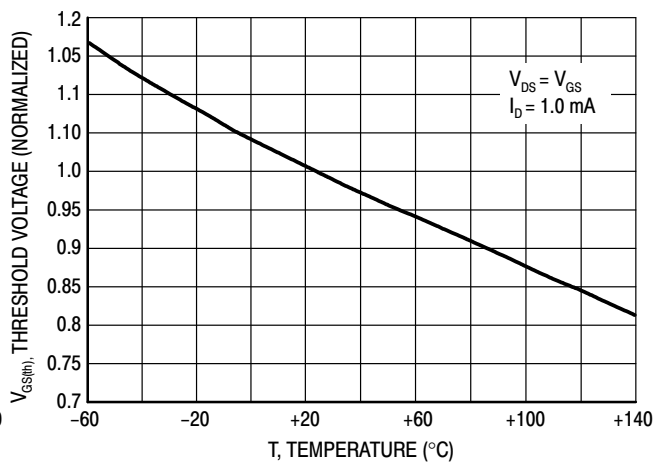
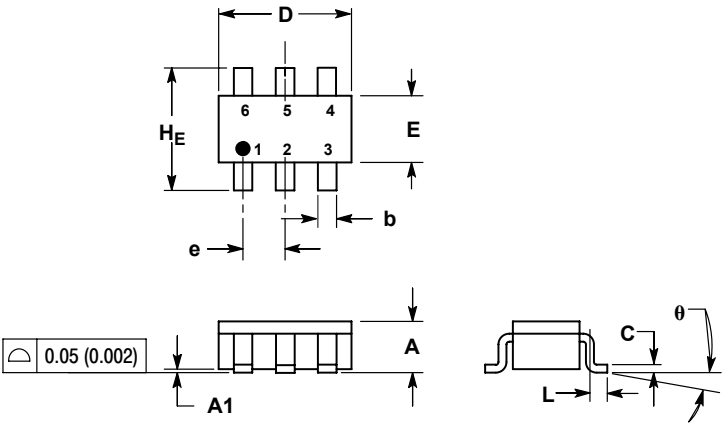


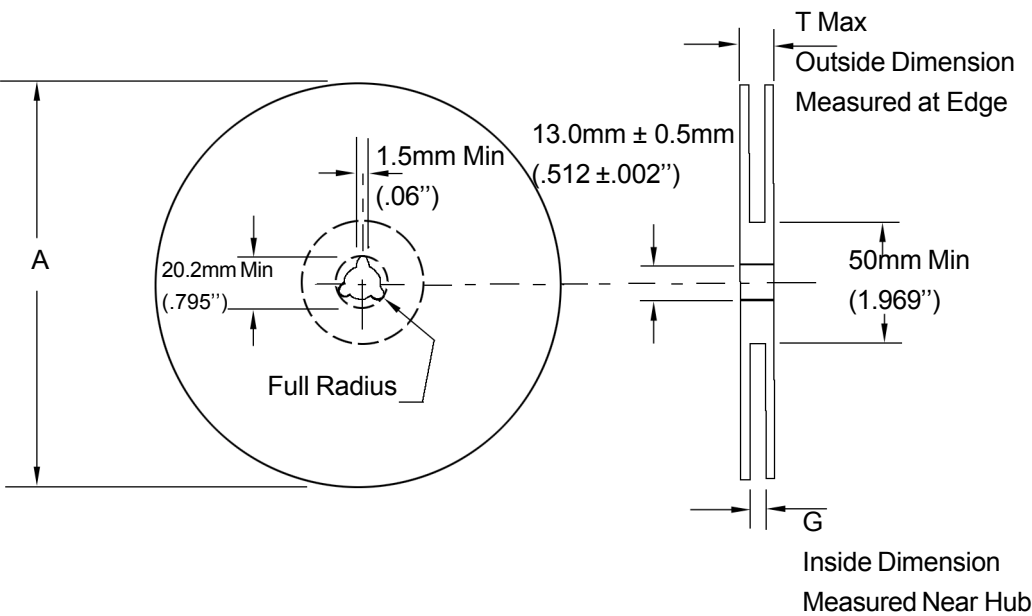
Figure 4. Temperature versus Gate Threshold Voltage

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DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.25	0.37	0.50	0.010	0.015	0.020
c	0.10	0.18	0.26	0.004	0.007	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
E	1.30	1.50	1.70	0.051	0.059	0.067
e	0.85	0.95	1.05	0.034	0.037	0.041
L	0.20	0.40	0.60	0.008	0.016	0.024
HE	2.50	2.75	3.00	0.099	0.108	0.118
θ	0°	-	10°	0°	-	10°

EMBOSED TAPE AND REEL DATA
FOR DISCRETES



Size	A Max	G	T Max
8 mm	178.0mm (7.0")	8.4mm+1.5mm, -0.0 (.33"+.039", -0.00)	10.9mm (.43")

Reel Dimensions

Metric Dimensions Govern — English are in parentheses for reference only

Storage Conditions

Temperature: 5 to 40 Deg.C (20 to 30 Deg. C is preferred)
Humidity: 30 to 80 RH (40 to 60 is preferred)
Recommended Period: One year after manufacturing
(This recommended period is for the soldering condition only. The characteristics and reliabilities of the products are not restricted to this limitation)