

TM05N06MI

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

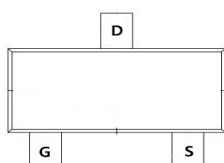
- Load switch
- PWM

General Features

$V_{DS} = 60V$ $I_D = 5.0A$

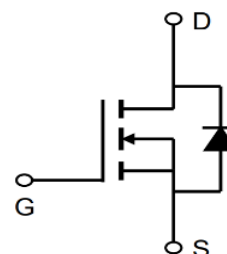
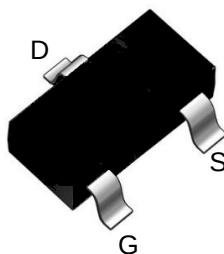
$R_{DS(ON)} = 40 m\Omega (Typ.) @ V_{GS} = 10V$

100% UIS Tested
 100% R_g Tested



Marking: 6005

MI:SOT-23-3L



Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	5.0	A
		$T_C = 100^\circ C$	3.8	A
I_{DM}	Pulsed Drain Current ^{note1}		18	A
EAS	Single Pulsed Avalanche Energy ^{note2}			mJ
P_D	Power Dissipation	$T_C = 25^\circ C$	3	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		73	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	$^\circ C$



TM05N06MI

N-Channel Enhancement Mosfet

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =15A	-	40	49	mΩ
		V _{GS} =4.5V, I _D =10A	-	45	63	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	625	-	pF
C _{oss}	Output Capacitance		-	49	-	pF
C _{rss}	Reverse Transfer Capacitance		-	41	-	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =4.5A, V _{GS} =10V	-	14	-	nC
Q _{gs}	Gate-Source Charge		-	2.9	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	5.2	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =30V,I _D =2A, R _L =6.7Ω,R _G =3Ω, V _{GS} =10V	-	5	-	ns
t _r	Turn-on Rise Time		-	2.6	-	ns
t _{d(off)}	Turn-off Delay Time		-	16.1	-	ns
t _f	Turn-off Fall Time		-	2.3	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _s	Maximum Continuous Drain to Source Diode Forward Current		-	-	5	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	30	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =15A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	T _J =25℃,I _F =15A, dI/dt=100A/μs	-	35	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	53	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition : $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=6.1A$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

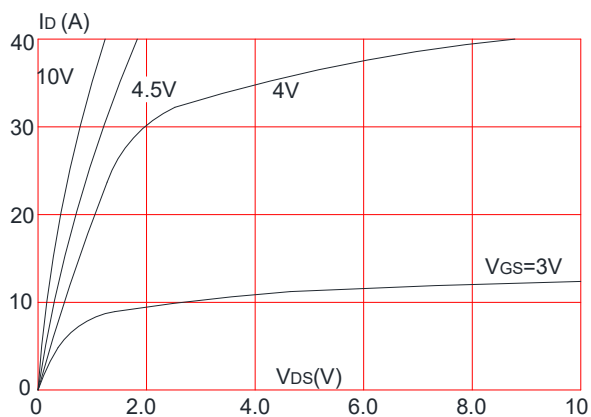


Figure 2: Typical Transfer Characteristics

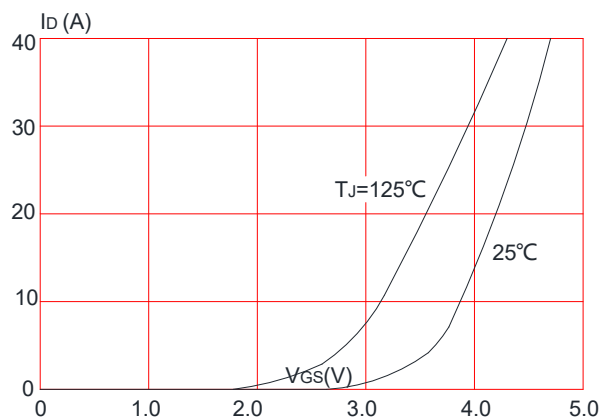


Figure 3: On-resistance vs. Drain Current

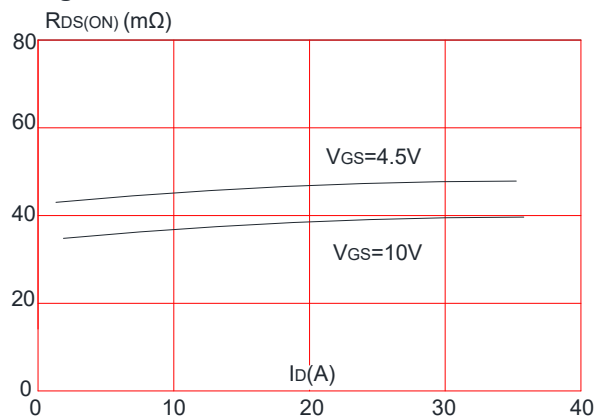


Figure 4: Body Diode Characteristics

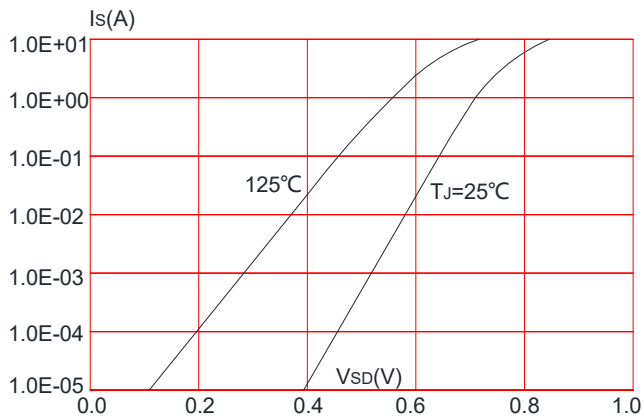


Figure 5: Gate Charge Characteristics

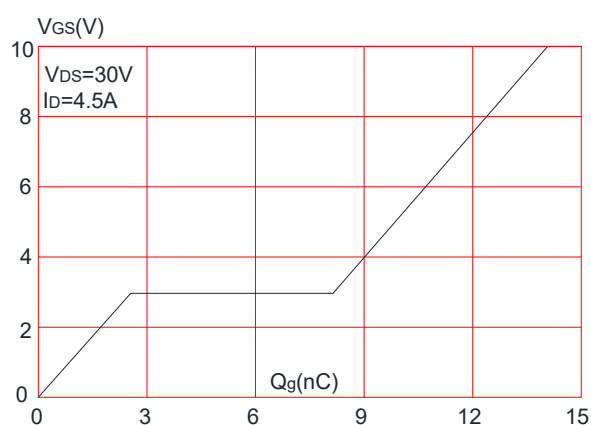


Figure 6: Capacitance Characteristics

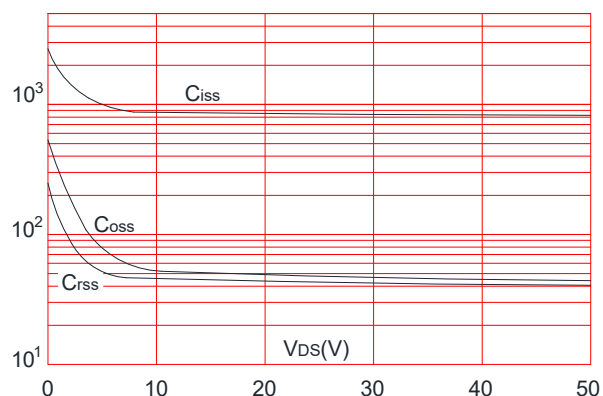


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

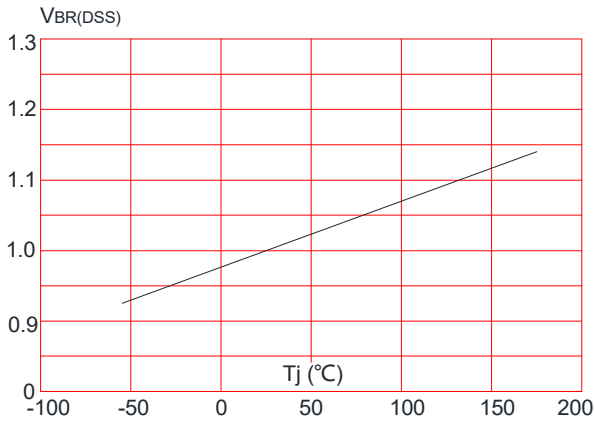


Figure 8: Normalized on Resistance vs. Junction Temperature

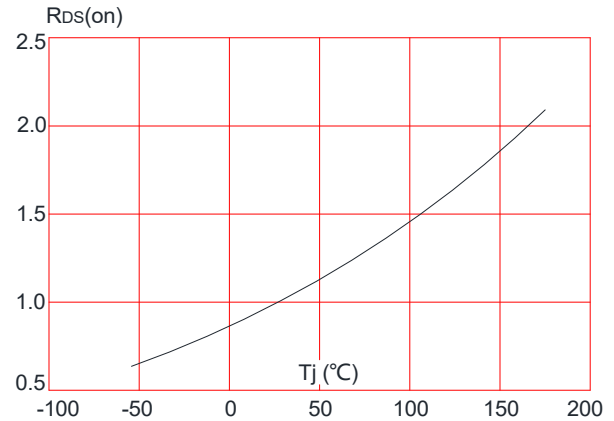


Figure 9: Maximum Safe Operating Area

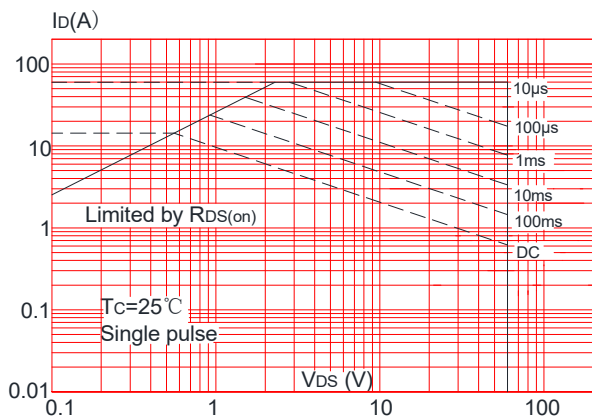


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

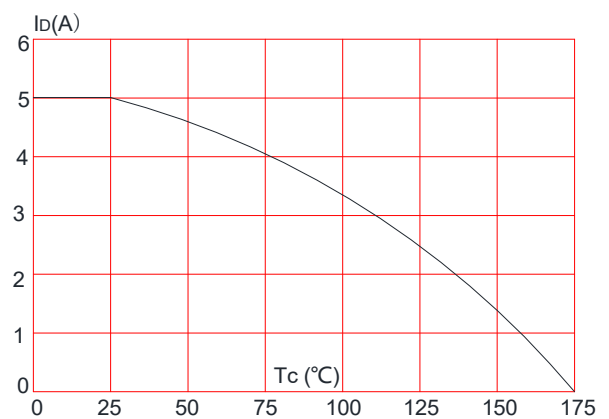
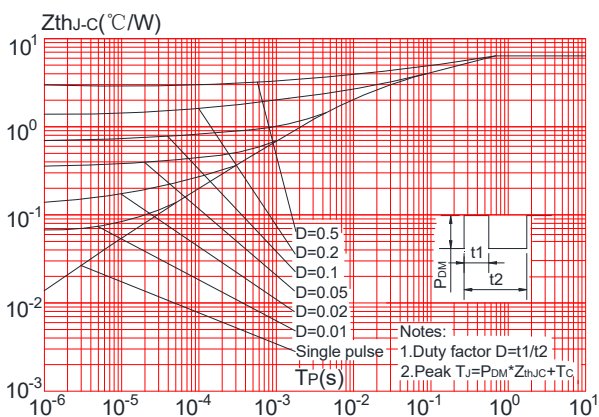
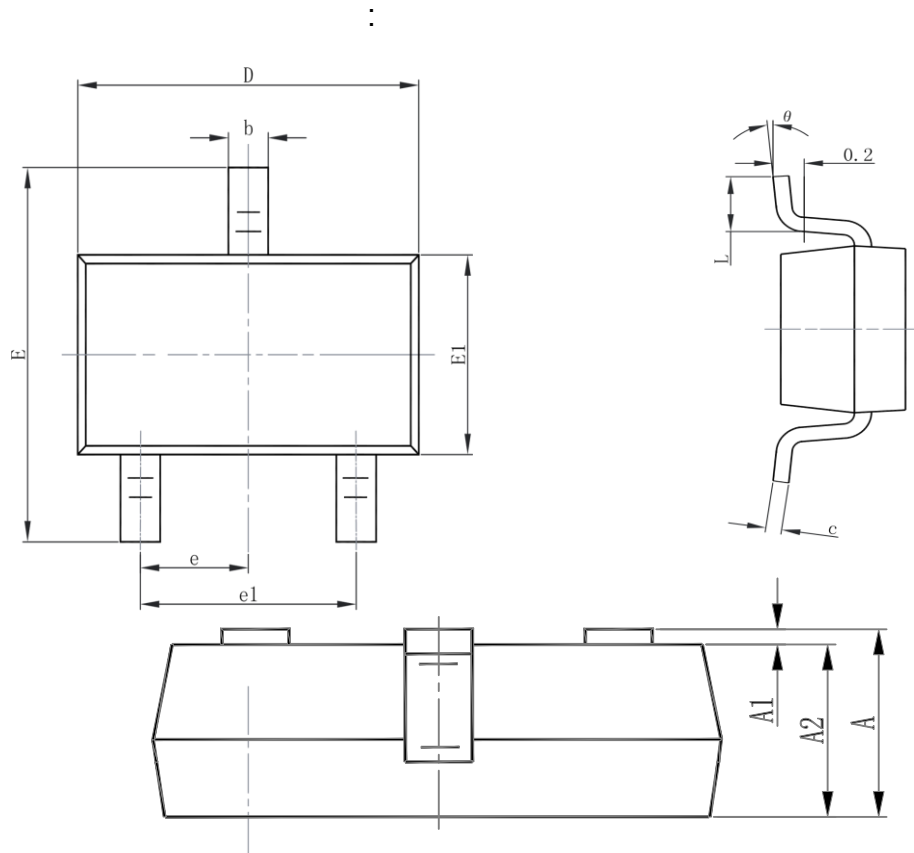


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Information:SOT-23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°