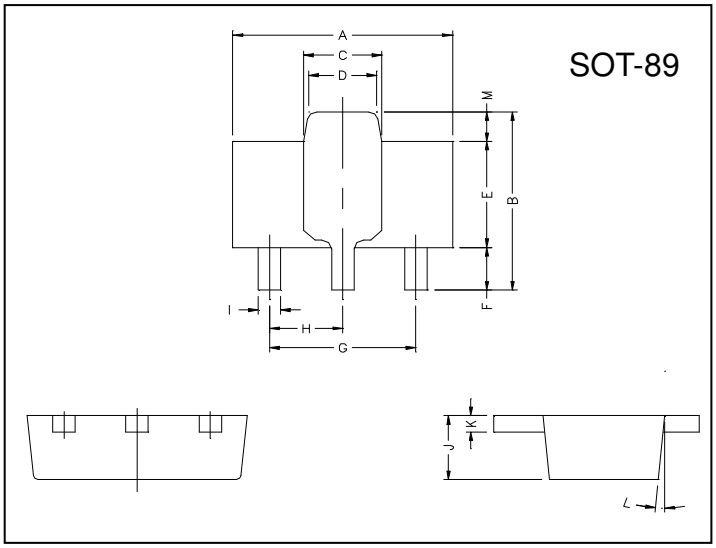
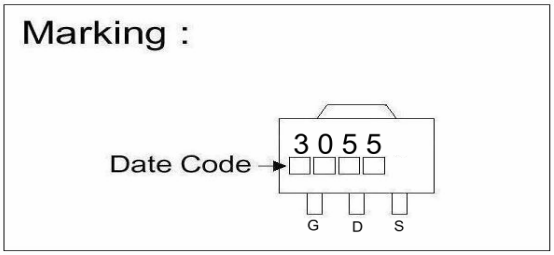
GM3055 N-CHANNEL ENHANCEMENT MODE POWER MOSFET

Description

The SOT-89 package is universally preferred for all commercial industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

Package Dimensions





REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.4	4.6	G	3.00 REF.	
B	4.05	4.25	H	1.50 REF.	
C	1.50	1.70	I	0.40	0.52
D	1.30	1.50	J	1.40	1.60
E	2.40	2.60	K	0.35	0.41
F	0.89	1.20	L	5° TYP.	
			M	0.70 REF.	

Absolute Maximum Ratings at Ta = 25℃

Parameter	Symbol	Ratings	Unit
Operating Junction Temperature Range	Tj	-55 ~+150	℃
Storage Temperature Range	Tstg	-55 ~ +150	℃
Drain - Source Voltage	V_{DS}	30	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current ,VGS@10V	I_D@TC=25℃	15	A
Continuous Drain Current ,VGS@10V	I_D@TC=100℃	9	A
Pulsed Drain Current[1]	I_{DM}	50	A
Total Power Dissipation	P_D@TC=25℃	15	W

Thermal Data

Symbol	parameter		Value	Unit
Rthj-case	Thermal Resistance junction-case	Max.	3	℃/W
Rthj-amb	Thermal Resistance junction-ambient	Max.	42	℃/W

Source –Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
Is	Continuous source Current (Body Diode)	V_D=V_G=0V, V_S=1.3V	-	-	15	A
I_{SM}	Pulsed Source Current(Body Diode)[1]		-	-	50	A
V_{SD}	Forward On Voltage[2]	Tj=25℃,Is=15A,V_{GS}=0V	-	-	1.3	V

Notes:

1. Pulse width limited by safe operating area.
2. Pulse width ≤300us, duty cycle ≤2%.

Electrical Characteristics @Tj = 25℃(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain – Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	30	-	-	V
$\Delta BV_{DSS}/\Delta Tj$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, ID=1mA	-	0.037	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V,I_D=8A	-	-	80	mΩ
		V_{GS}=4.5V,I_D=6A	-	-	100	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
I_{DSS}	Drain-Source Leakage Current(Tj=25℃)	V_{DS}=30V,V_{GS}=0V	-	-	25	uA
	Drain-Source Leakage Current(Tj=150℃)	V_{DS}=24V,V_{GS}=0V	-	-	250	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V	-	-	±100	nA
Qg	Total Gate Charge[2]	I_D=8A	-	5.4	-	nC
Qgs	Gate-Source Charge	V_{DS}=24V	-	1.3	-	nC
Qgd	Gate-Drain (“Miller)Charge	V_{GS}=5V	-	3.6	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=15V	-	3.6	-	nS
tr	Rise Time	I_D=8A	-	19.8	-	nS
$t_{d(off)}$	Turn-off Delay Time	R_G=3.4Ω,V_{GS}=10V	-	13	-	nS
tf	Fall Time	R_D=1.9Ω	-	3.2	-	nS
Ciss	Input Capacitance	V_{GS}=0V	-	260	-	pf
Coss	Output Capacitance	V_{DS}=25V	-	144	-	pf
Crss	Reverse Transfer Capacitance	f=1.0MHZ	-	13	-	pf

Characteristics Curve

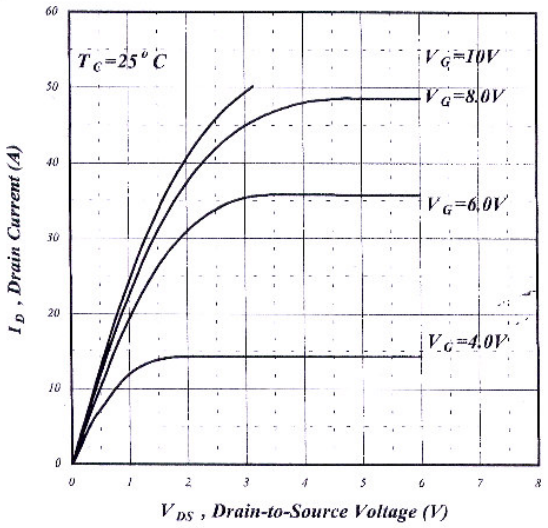


Fig 1. Typical Output Characteristics

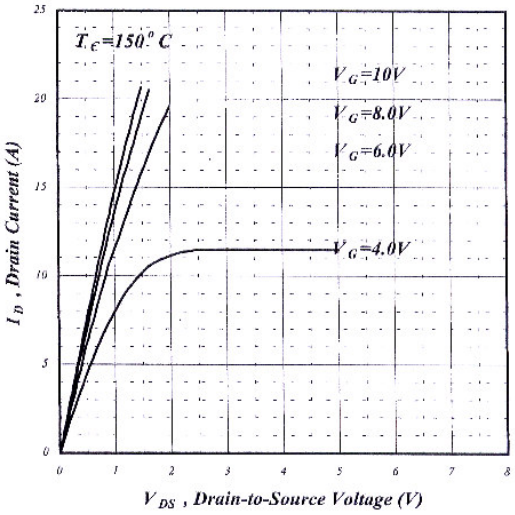


Fig 2. Typical Output Characteristics

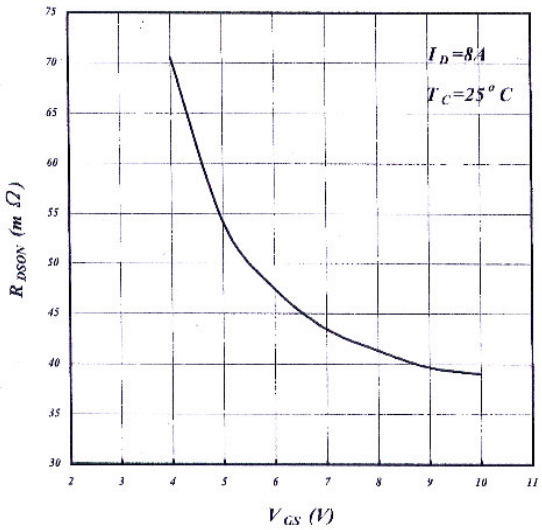


Fig 3. On-Resistance v.s. Gate Voltage

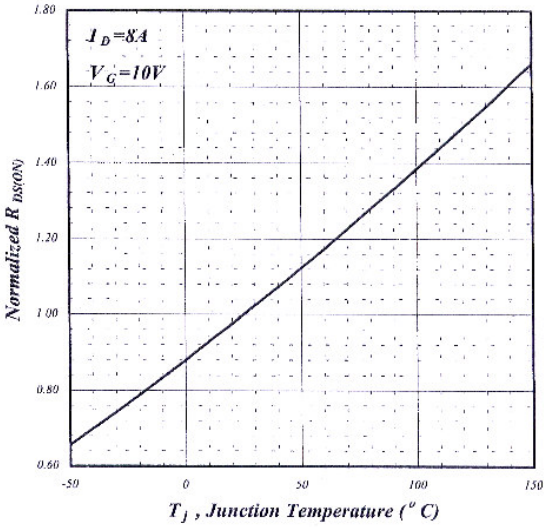


Fig 4. Normalized On-Resistance v.s. Junction Temperature

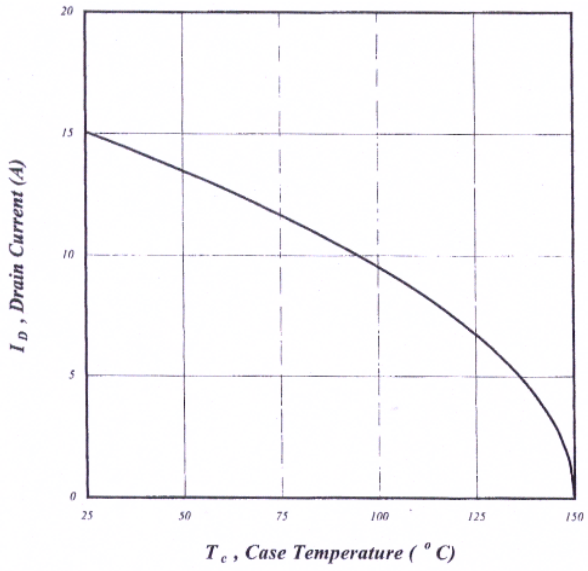


Fig 5. Maximum Drain Current v.s. Case Temperature

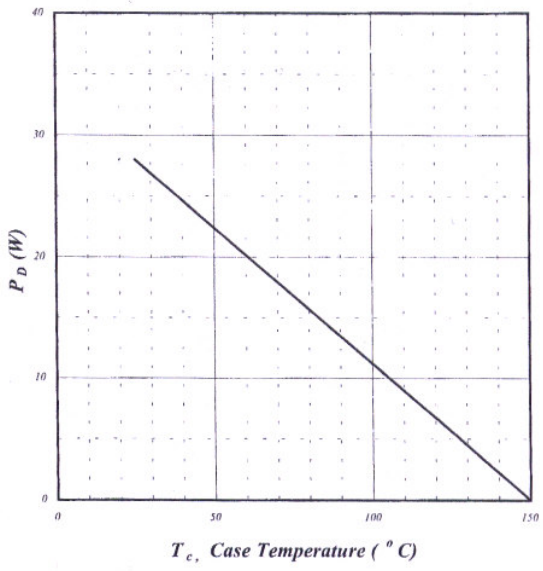


Fig 6. Typical Power Dissipation

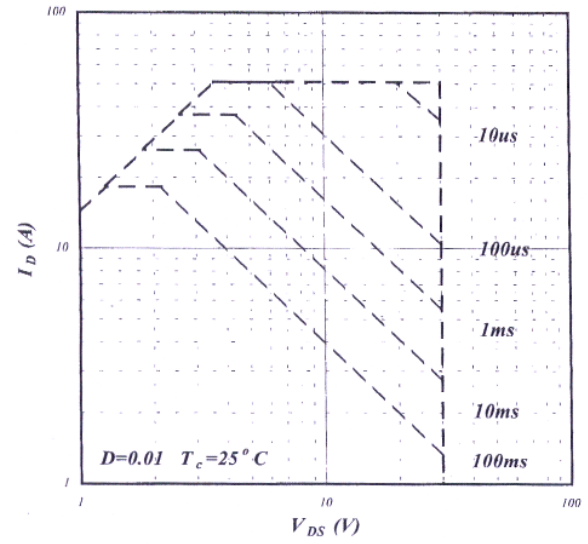


Fig 7. Maximum Safe Operating Area

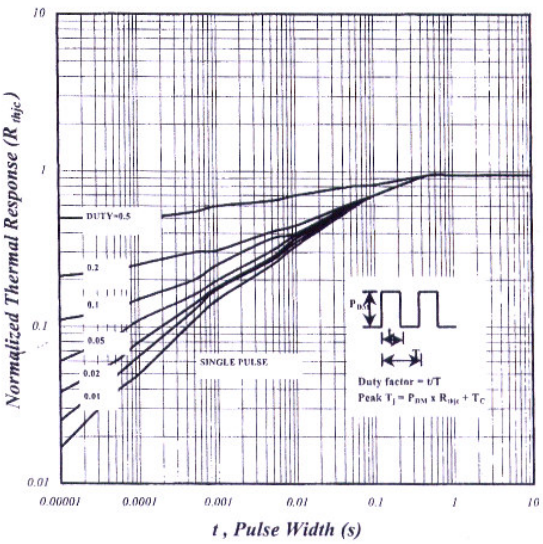


Fig 8. Effective Transient Thermal Impedance

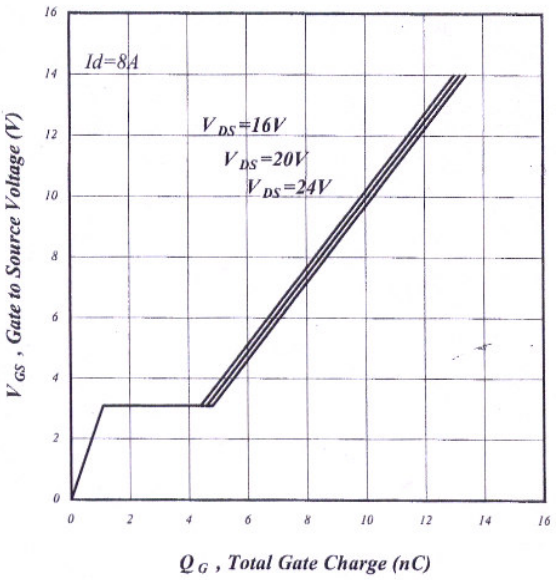


Fig 9. Gate Charge Characteristics

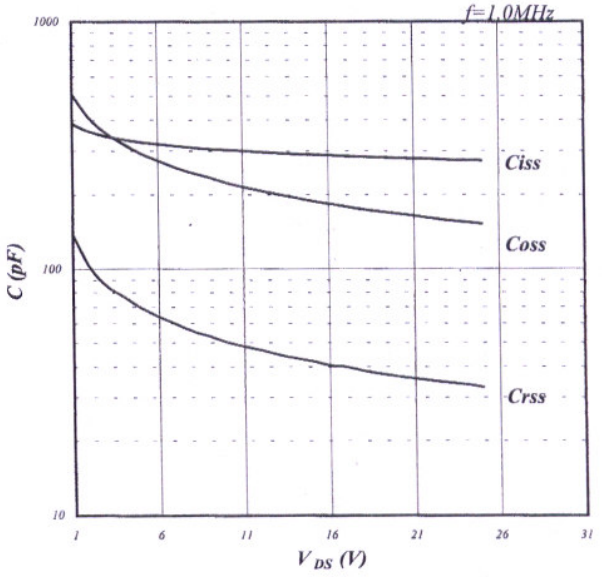


Fig 10. Typical Capacitance Characteristics

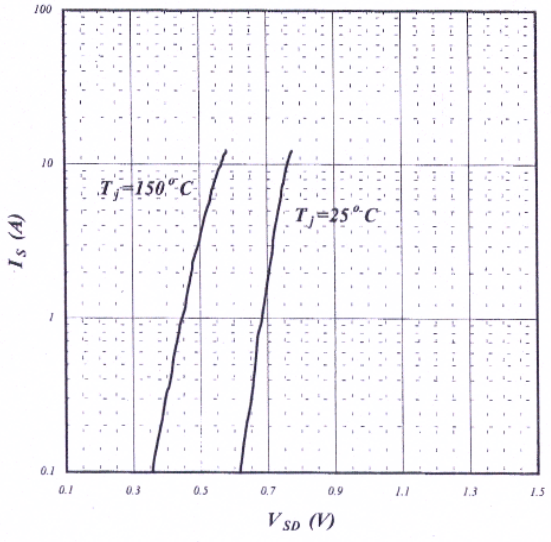


Fig 11. Forward Characteristic of Reverse Diode

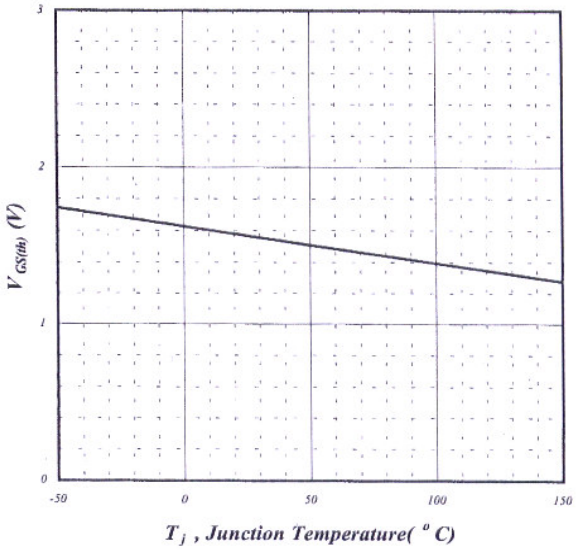


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

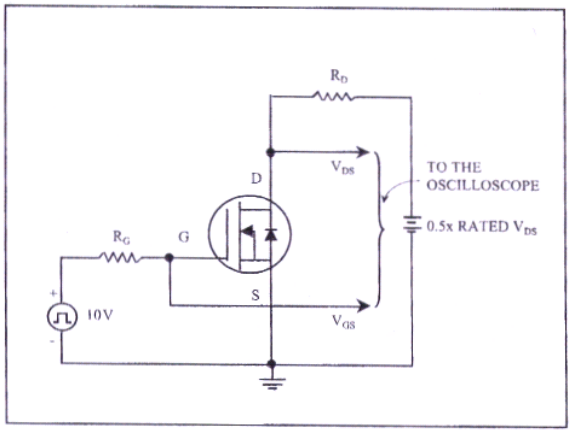


Fig 13. Switching Time Circuit

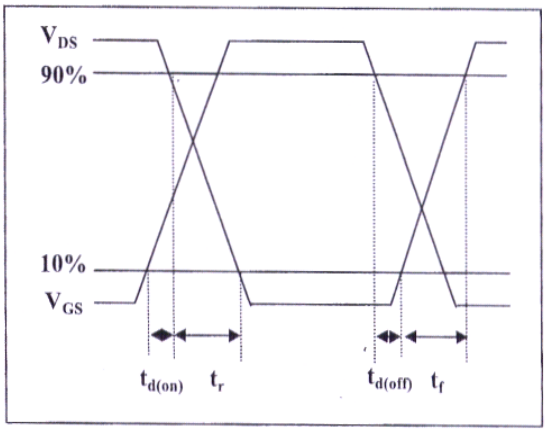


Fig 14. Switching Time Waveform

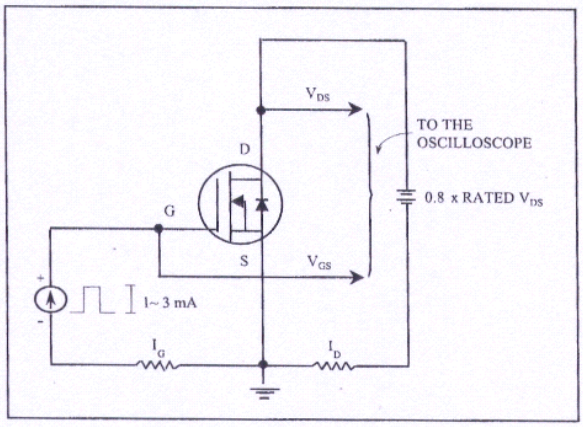


Fig 15. Gate Charge Circuit

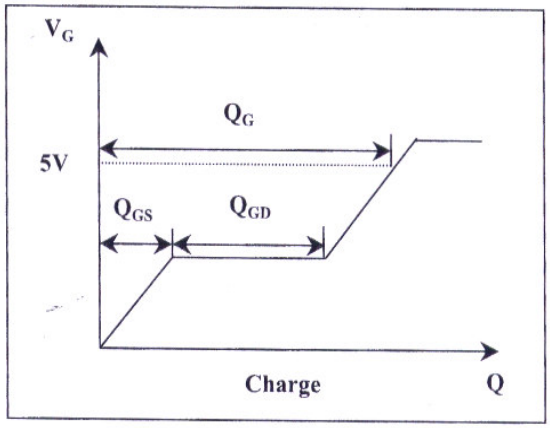


Fig 16. Gate Charge Waveform

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