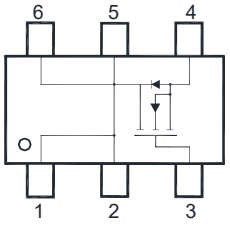
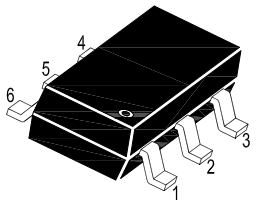
MD06N090L-AH

N-Channel Enhancement Mode MOSFET

Features

- AEC-Q101 Qualified
- Surface-mounted package
- Halogen and Antimony Free(HAF), RoHS compliant





1.Drain 2.Drain 3.Gate
4.Source 5.Drain 6.Drain
SOT-26 Plastic package

Applications

- Portable appliances
- Battery management

Absolute Maximum Ratings (at T_a = 25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	3	A
Drain Current - Pulsed [1]	I_{DM}	12	A
Total Power Dissipation [2]	P_{tot}	2	W
Operating Junction and Storage Temperature Range	T_j, T_{stg}	- 55 to + 150	℃

Thermal Resistance Ratings

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient [2]	$R_{\theta JA}$	62.5	℃/W

[1] Pulse Test: Pulse Width ≤ 100 μs, Duty Cycle ≤ 2%,Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

[2] Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air, t ≤ 10 s.

Dated: 19/03/2024 Rev:01

Characteristics at T_a = 25℃ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at I_D = 250 µA	$V_{(BR)DSS}$	60	-	-	V
Drain-Source Leakage Current at V_{DS} = 48 V	I_{DSS}	-	-	1	µA
Gate-Source Leakage Current at V_{GS} = ± 16 V	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage at V_{GS} = V_{DS}, I_D = 250 µA	$V_{GS(th)}$	1.2	-	2.5	V
Drain-Source On-State Resistance at V_{GS} = 10 V, I_D = 2 A at V_{GS} = 4.5 V, I_D = 1 A	$R_{DS(on)}$	- -	- -	80 90	mΩ
DYNAMIC PARAMETERS					
Forward Transconductance at V_{DS} = 5 V, I_D = 1 A	g_{FS}	-	4.2	-	S
Gate Resistance at V_{DS} = 0 V, V_{GS} = 0 V, f = 1 MHz	R_g	-	1.4	-	Ω
Input Capacitance at V_{DS} = 30 V, V_{GS} = 0 V, f = 1 MHz	C_{iss}	-	445	-	pF
Output Capacitance at V_{DS} = 30 V, V_{GS} = 0 V, f = 1 MHz	C_{oss}	-	22	-	pF
Reverse Transfer Capacitance at V_{DS} = 30 V, V_{GS} = 0 V, f = 1 MHz	C_{rss}	-	18	-	pF
Gate Charge Total at V_{DS} = 30 V, V_{GS} = 10 V, I_D = 2 A at V_{DS} = 30 V, V_{GS} = 4.5 V, I_D = 2 A	Q_g	- -	8.6 4	- -	nC
Gate to Source Charge at V_{DS} = 30 V, V_{GS} = 10 V, I_D = 2 A	Q_{gs}	-	1.8	-	nC
Gate to Drain Charge at V_{DS} = 30 V, V_{GS} = 10 V, I_D = 2 A	Q_{gd}	-	1.2	-	nC
Turn-On Delay Time at V_{DS} = 30 V, V_{GS} = 10 V, I_D = 2 A, R_g = 4.7 Ω	$t_{d(on)}$	-	7	-	ns
Turn-On Rise Time at V_{DS} = 30 V, V_{GS} = 10 V, I_D = 2 A, R_g = 4.7 Ω	t_r	-	2	-	ns
Turn-Off Delay Time at V_{DS} = 30 V, V_{GS} = 10 V, I_D = 2 A, R_g = 4.7 Ω	$t_{d(off)}$	-	6	-	ns
Turn-Off Fall Time at V_{DS} = 30 V, V_{GS} = 10 V, I_D = 2 A, R_g = 4.7 Ω	t_f	-	5	-	ns
BODY DIODE PARAMETERS					
Drain-Source Diode Forward Voltage at I_S = 1 A	V_{SD}	-	-	1.2	V
Body-Diode Continuous Current	I_S	-	-	3	A
Body Diode Reverse Recovery Time at I_S = 2 A, di/dt = 100 A / µs	t_{rr}	-	8	-	ns
Body Diode Reverse Recovery Charge at I_S = 2 A, di/dt = 100 A / µs	Q_{rr}	-	4	-	nC

Electrical Characteristics Curves

Fig. 1 Typical Output Characteristics

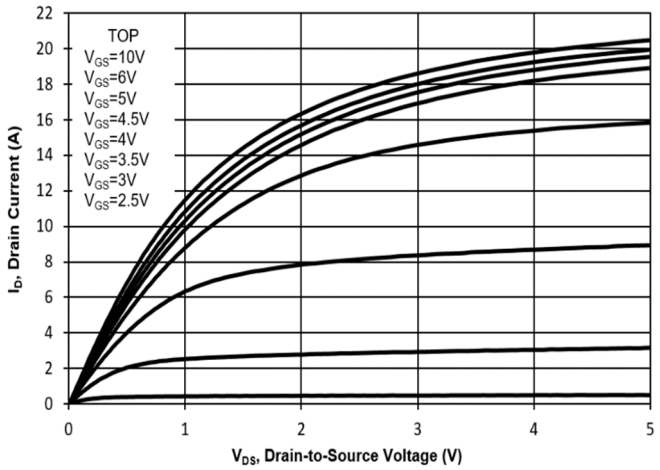


Fig. 2 Typical Transfer Characteristics

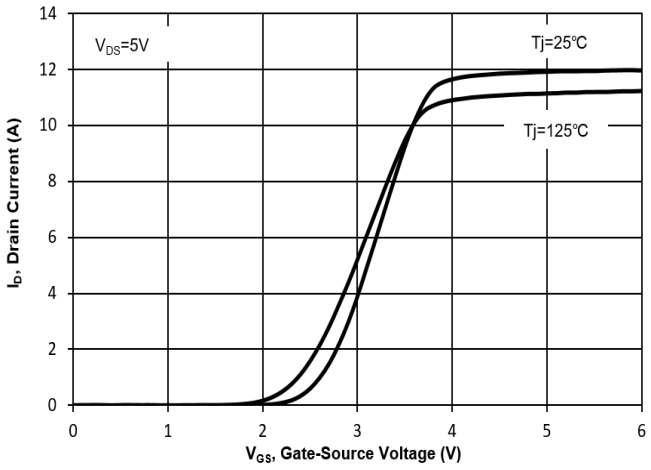


Fig. 3 On-Resistance vs. Drain Current

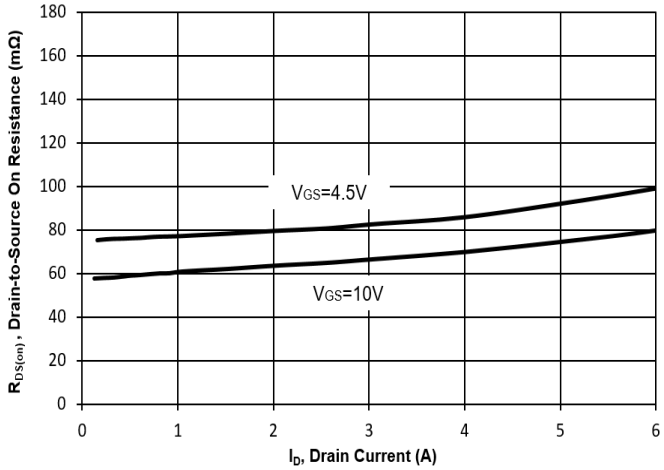


Fig. 4 On-Resistance vs. Gate-Source Voltage

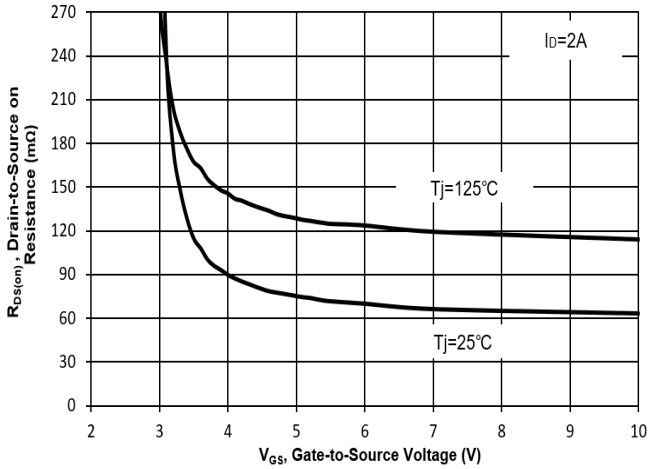


Fig. 5 On-Resistance vs.T_j

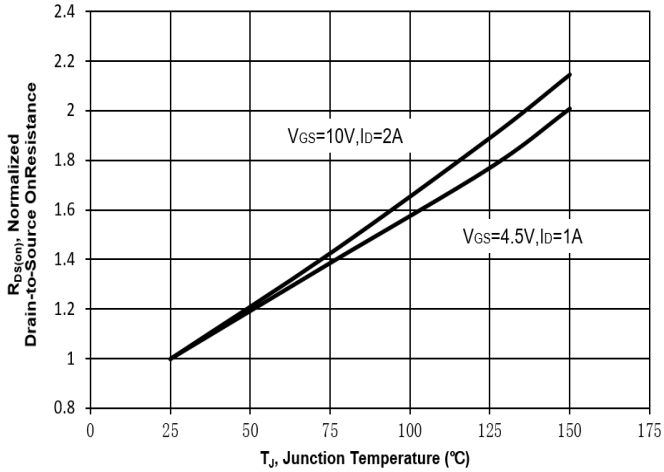
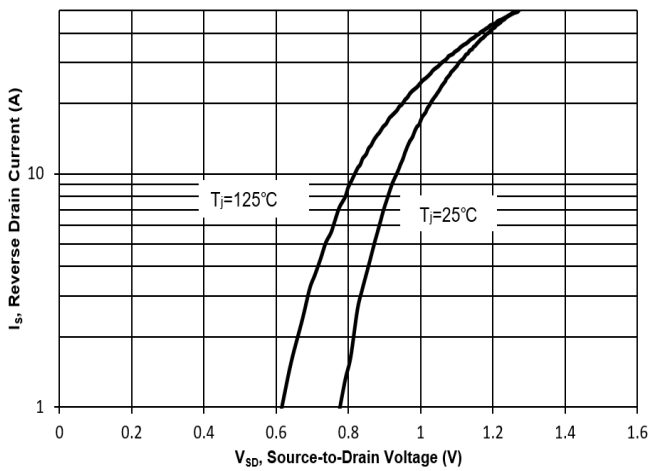


Fig. 6 Typical Body-Diode Forward Characteristics



Electrical Characteristics Curves

Fig. 7 Typical Junction Capacitance

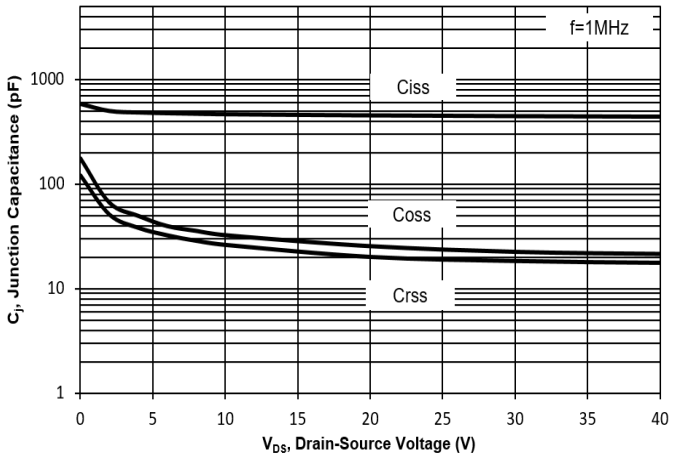


Fig. 8 Drain-Source Leakage Current vs. T_j

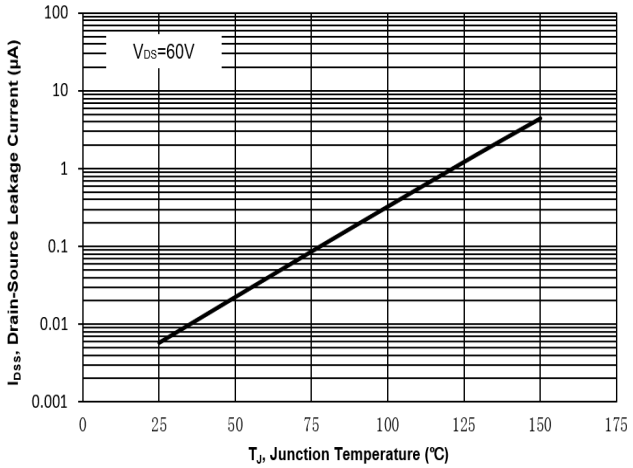


Fig. 9 $V_{(BR)DSS}$ vs. Junction Temperature

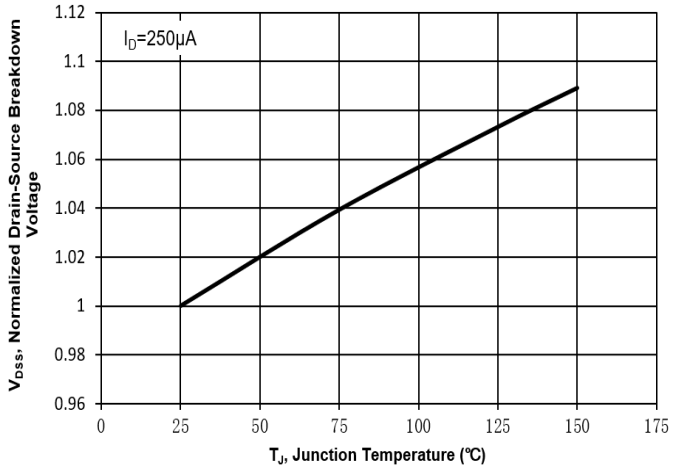


Fig. 10 Gate Threshold Variation vs. T_j

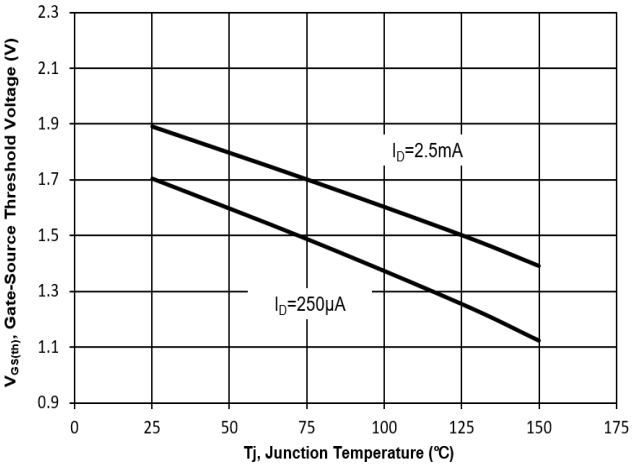
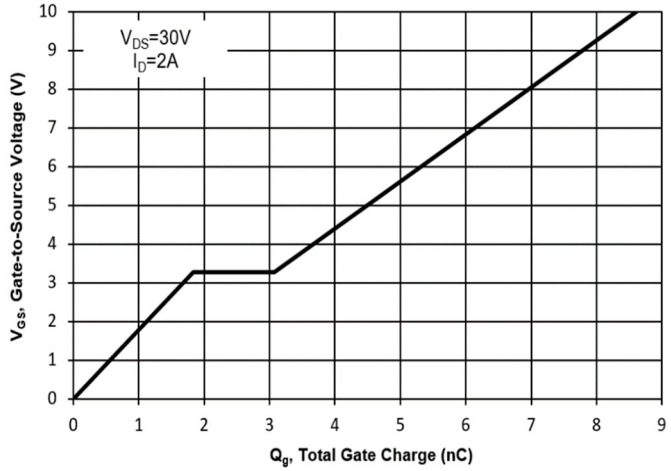


Fig. 11 Gate Charge



Test Circuits

Fig.1-1 Switching times test circuit

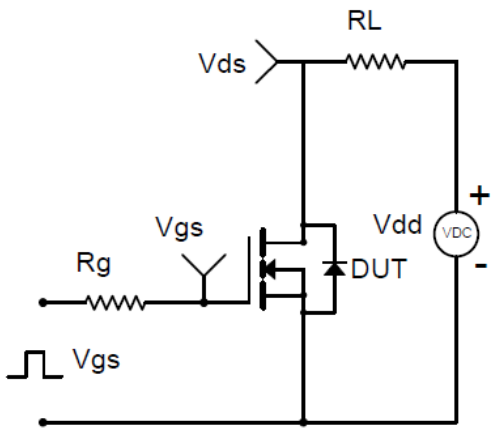


Fig.1-2 Switching Waveform

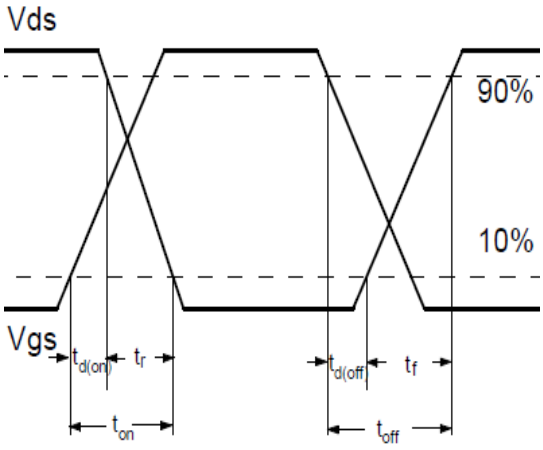


Fig.2-1 Gate charge test circuit

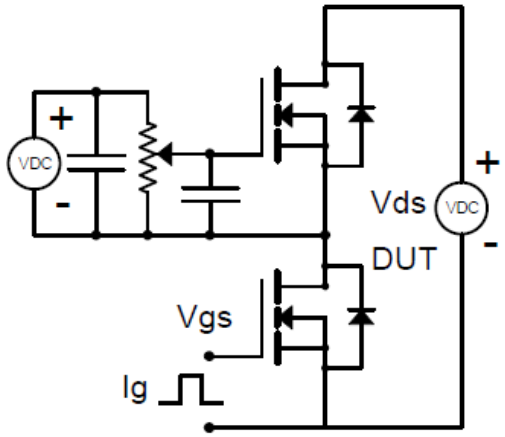
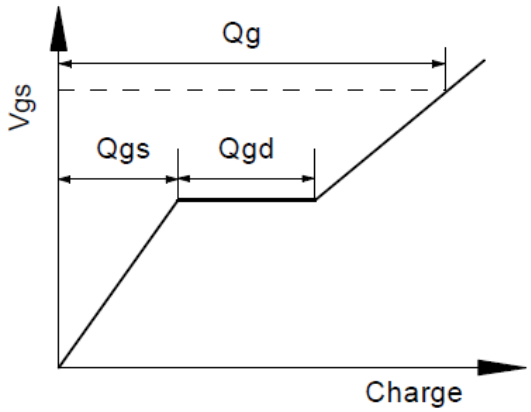
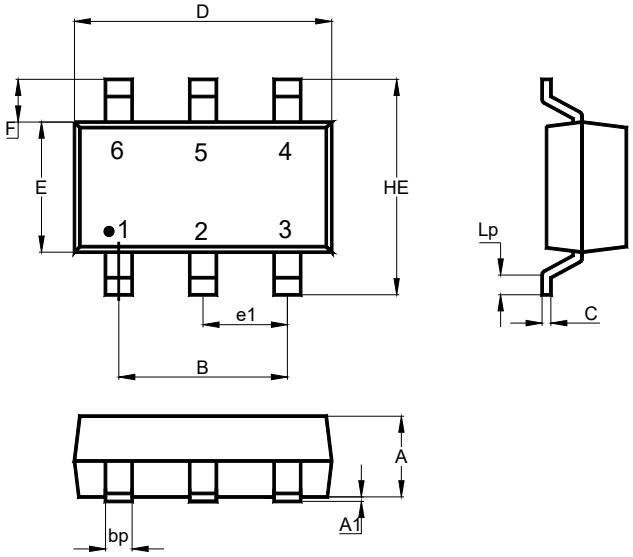


Fig.2-2 Gate charge waveform

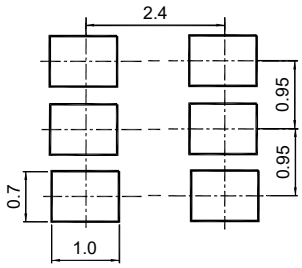


Package Outline (Dimensions in mm) SOT-26



Unit	A	A1	B	C	D	E	e1	F	HE	Lp	bp
mm	1.2 1.0	0.1 0	2.1 1.7	0.20 0.08	3.1 2.7	1.7 1.3	0.95 typ.	0.65 0.6	3.0 2.6	0.6 0.2	0.5 0.3

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-26	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

" LT " = Part No.

" • " = HAF (Halogen and Antimony Free)

" YM " = Date Code Marking

" Y " = Year

" M " = Month

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