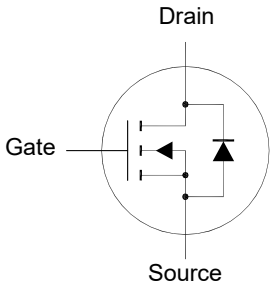
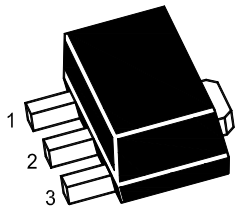
MU10N125L

N-Channel Enhancement Mode MOSFET





1.Gate 2.Drain 3.Source
SOT-89 Plastic Package

Features
- Low Leakage Current

Applications
- Portable appliances
- Battery management

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	T_C = 25℃	I_D	10	A
Peak Drain Current, Pulsed [1]		I_{DM}	30	A
Power Dissipation	T_C = 25℃	P_D	20	W
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	- 55 to + 150	℃

Thermal Resistance Ratings

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case	$R_{\theta JC}$	6.25	℃/W
Thermal Resistance from Junction to Ambient [2]	$R_{\theta JA}$	100	℃/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.

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Dated: 28/05/2021 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	$V_{(BR)DSS}$	100	-	-	V
Zero Gate Voltage Drain Current at V_{DS} = 80 V	I_{DSS}	-	-	1	µA
Gate-Source Leakage at V_{GS} = ± 20 V	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage at V_{DS} = V_{DS} , I_D = 250 µA	$V_{GS(th)}$	1	-	2.5	V
Drain-Source On-State Resistance at V_{GS} = 10 V, I_D = 5 A at V_{GS} = 4.5 V, I_D = 4 A	$R_{DS(on)}$	- -	- -	120 125	mΩ
DYNAMIC PARAMETERS					
Gate resistance at V_{DS} = 0 V, V_{GS} = 0 V, f = 1 MHz	R_g	-	1.54	-	Ω
Forward Transconductance at V_{DS} = 10 V, I_D = 5 A	g_{Fs}	-	6	-	S
Input Capacitance at V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz	C_{iss}	-	1306	-	pF
Output Capacitance at V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz	C_{oss}	-	35	-	pF
Reverse Transfer Capacitance at V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz	C_{rss}	-	28	-	pF
Total Gate Charge at V_{DS} = 50 V, I_D = 5 A, V_{GS} = 10 V at V_{DS} = 50 V, I_D = 5 A, V_{GS} = 4.5 V	Q_g	- -	22 10	- -	nC
Gate Source Charge at V_{DS} = 50 V, I_D = 5 A, V_{GS} = 10 V	Q_{gs}	-	5	-	nC
Gate Drain Charge at V_{DS} = 50 V, I_D = 5 A, V_{GS} = 10 V	Q_{gd}	-	2.7	-	nC
Turn-On Delay Time at V_{DS} = 50 V, I_D = 5 A, V_{GS} = 10 V, R_G = 3 Ω	$t_{d(on)}$	-	15	-	ns
Turn-On Rise Time at V_{DS} = 50 V, I_D = 5 A, V_{GS} = 10 V, R_G = 3 Ω	t_r	-	6	-	ns
Turn-Off Delay Time at V_{DS} = 50 V, I_D = 5 A, V_{GS} = 10 V, R_G = 3 Ω	$t_{d(off)}$	-	13.5	-	ns
Turn-Off Fall Time at V_{DS} = 50 V, I_D = 5 A, V_{GS} = 10 V, R_G = 3 Ω	t_f	-	2.2	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at V_{GS} = 0 V, I_S = 1 A	V_{SD}	-	-	1.2	V
Body Diode Reverse Recovery Time at I_S = 5 A, di/dt = 100 A/µs	t_{rr}	-	21	-	ns
Body Diode Reverse Recovery Charge at I_S = 5 A, di/dt = 100 A/µs	Q_{rr}	-	22	-	nC

Electrical Characteristics Curves

Fig. 1 Typical Output Characteristic

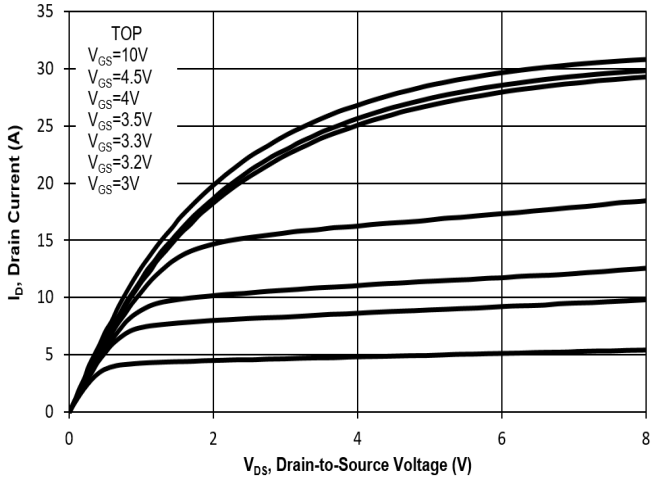


Fig. 2 Typical Transfer Characteristic

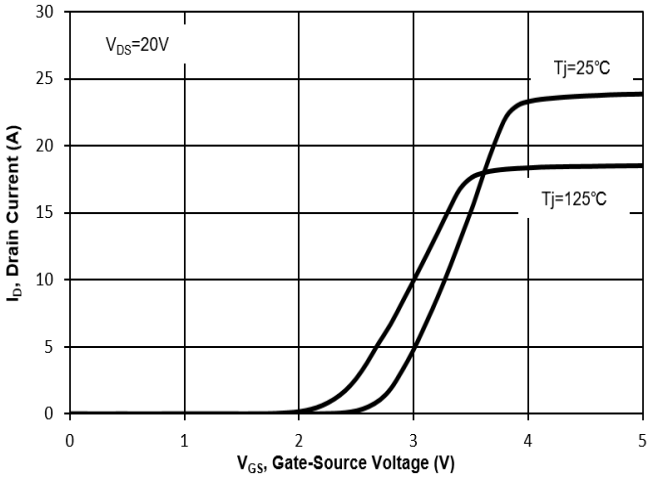


Fig. 3 On-Resistance vs. Drain Current

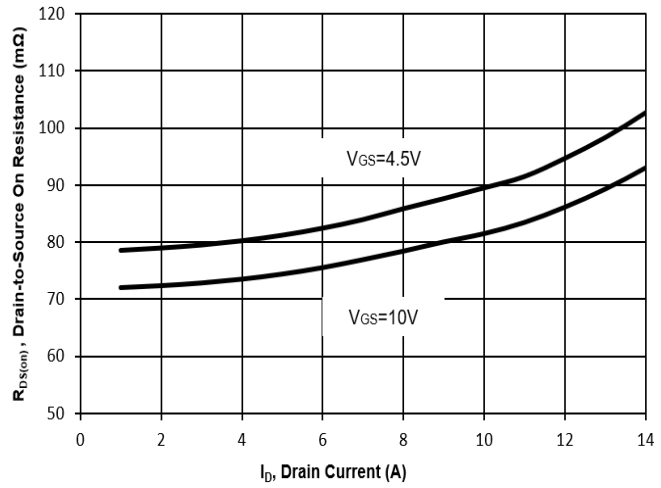


Fig. 4 On-Resistance vs. Gate Voltage

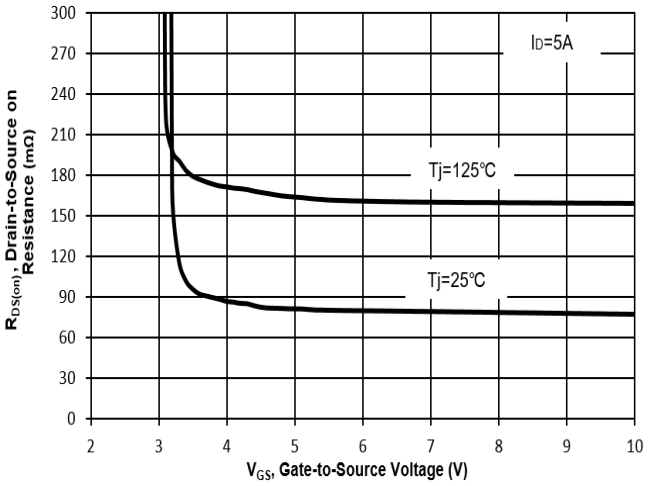


Fig. 5 On-Resistance vs.T_j

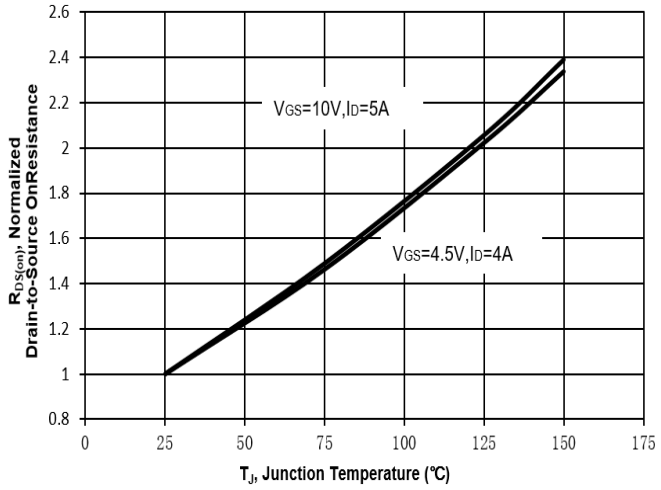
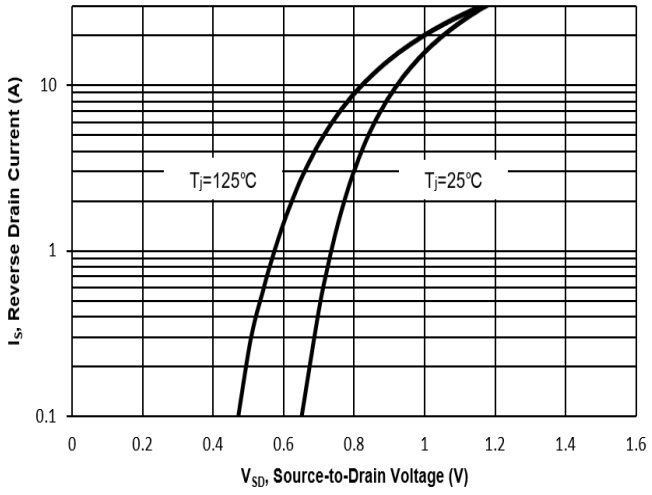


Fig. 6 Typical Body-Diode Forward Characteristic



Electrical Characteristics Curves

Fig. 7 Typical Junction Capacitance

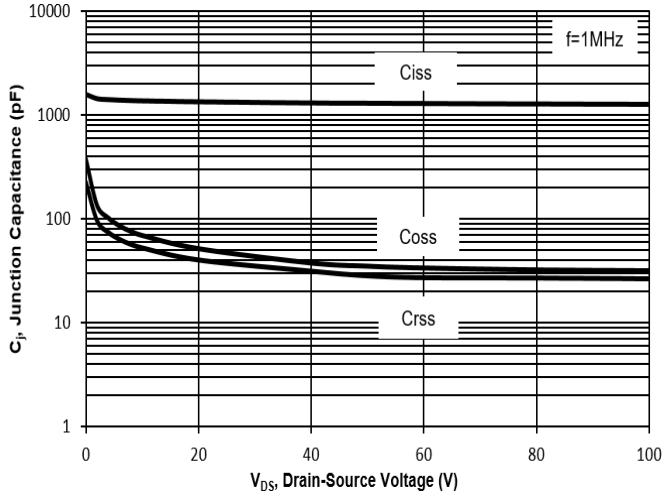


Fig. 8 Drain-Source Leakage Current vs. T_j

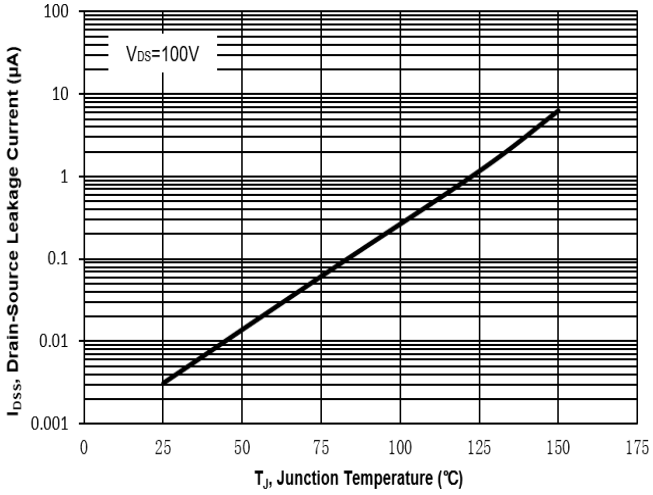


Fig. 9 $V_{(BR)DSS}$ vs. Junction Temperature

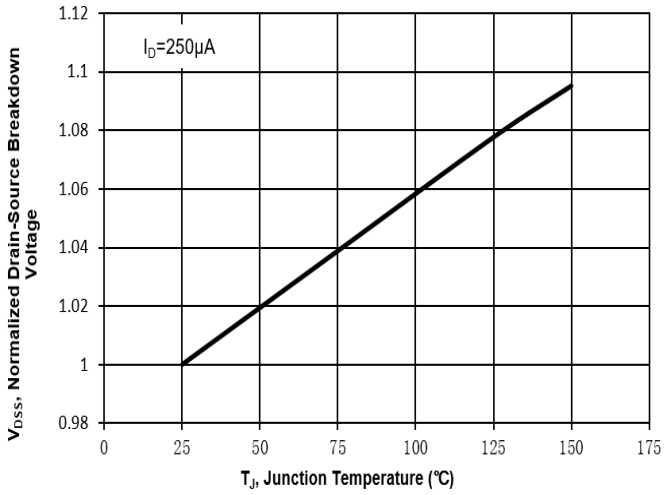


Fig. 10 Gate Threshold Variation vs. T_j

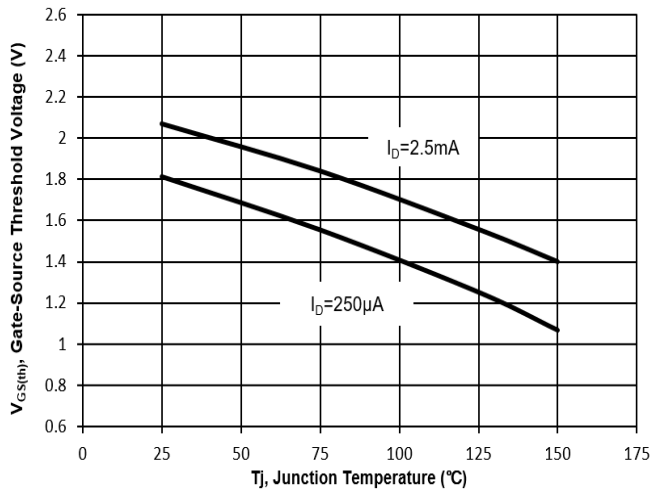
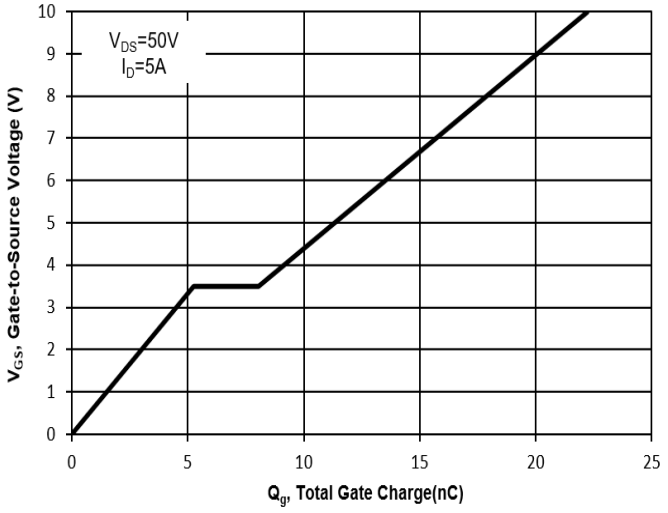


Fig. 11 Gate Charge



Test Circuits

Fig.1-1 Switching times test circuit

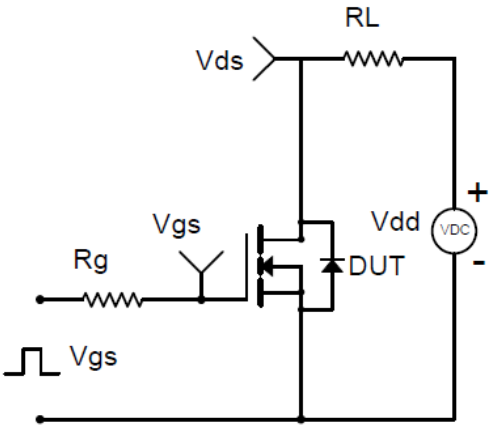


Fig.1-2 Switching Waveform

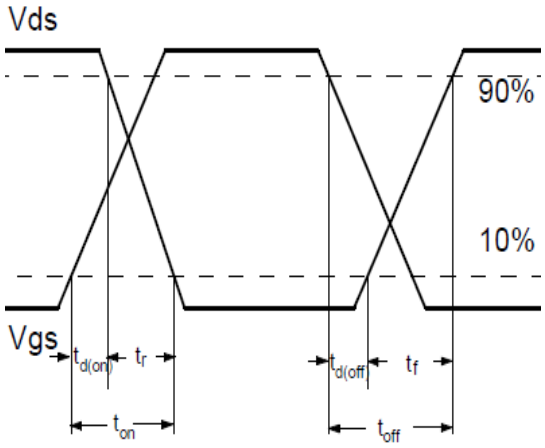


Fig.2-1 Gate charge test circuit

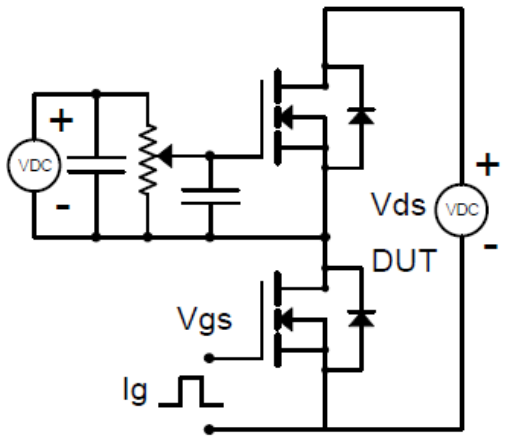
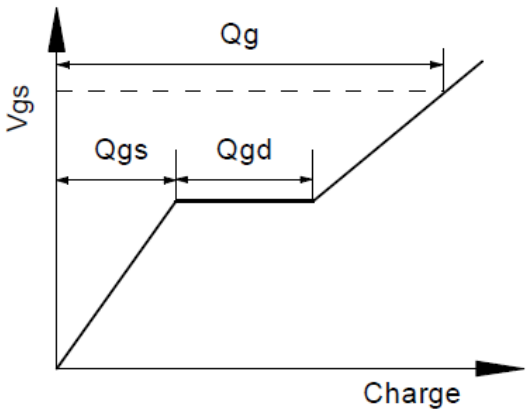
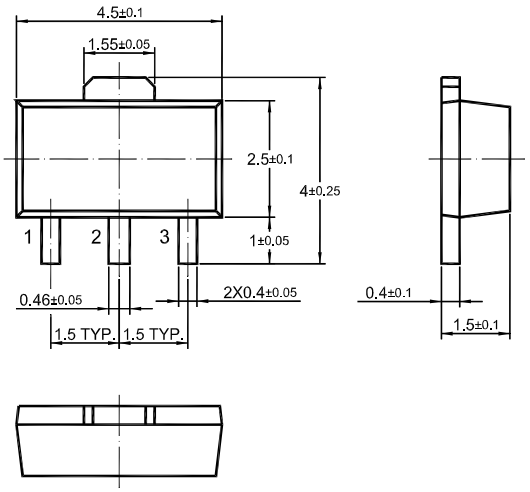


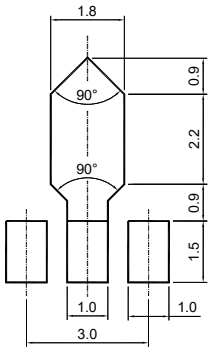
Fig.2-2 Gate charge waveform



Package Outline (Dimensions in mm) SOT-89



Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-89	12	8 ± 0.1	0.315 ± 0.004	178	7	1,000
				330	13	4,000

Marking information

" MU10N125L " = Part No.
"YM" = Date Code Marking
"Y" = Year
"M" = Month
Font type: Arial