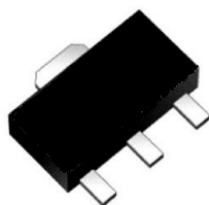
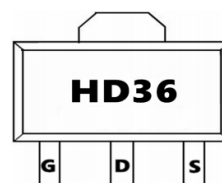
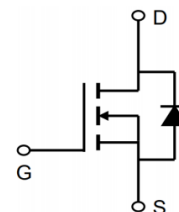


Main Product Characteristics:

V_{DSS}	30V
$R_{DS(on)}$	29m Ω (typ.)
I_D	6A


SOT89 - 3L

Marking and Pin Assignment

Schematic Diagram
Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	6	A
$I_D @ T_A = 70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	4.7	
I_{DM}	Pulsed Drain Current ②	30	
$P_D @ T_A = 25^\circ\text{C}$	Power Dissipation ③	1.5	W
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	V
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

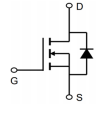
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
R _{θJC}	Junction-to-case ③	—	30	°C/W
R _{θJA}	Junction-to-ambient (t ≤ 10s) ④	—	85	°C/W

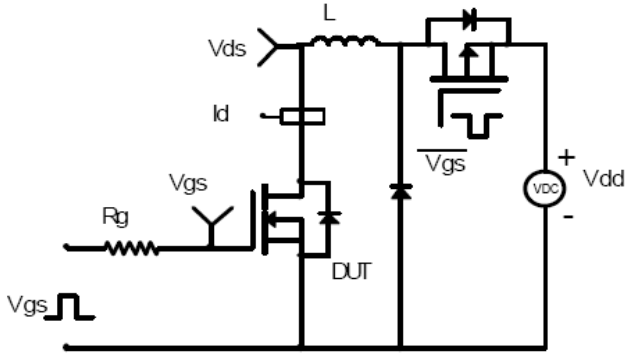
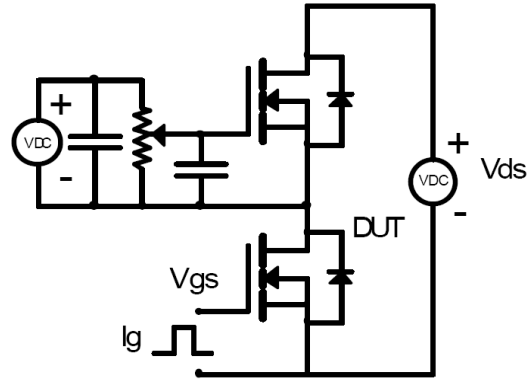
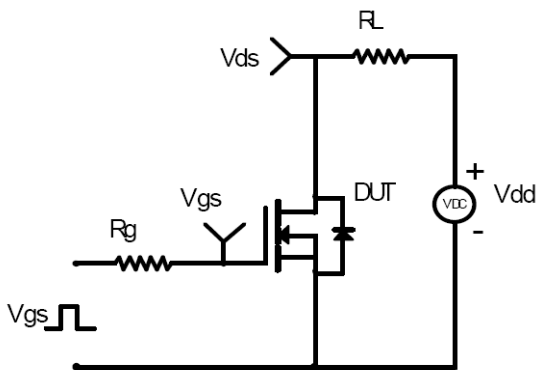
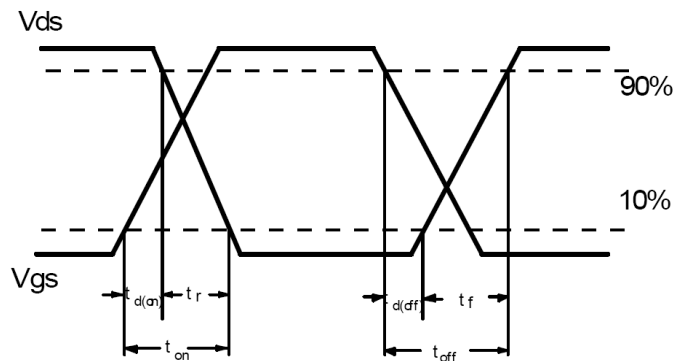
Electrical Characterizes @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source breakdown voltage	30	—	—	V	V _{GS} = 0V, I _D = 250μA
R _{DS(on)}	Static Drain-to-Source on-resistance	—	29	35	mΩ	V _{GS} = 4.5V, I _D = 5A
		—	36	40		V _{GS} = 2.5V, I _D = 4A
V _{GS(th)}	Gate threshold voltage	0.5	0.9	1.5	V	V _{DS} = V _{GS} , I _D = 250μA
I _{DSS}	Drain-to-Source leakage current	—	—	1	μA	V _{DS} = 24V, V _{GS} = 0V
I _{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V _{GS} = 20V
		—	—	-100		V _{GS} = -20V
Q _g	Total gate charge	—	5.8	—	nC	I _D = 5A, V _{DS} = 15V, V _{GS} = 4.5V
Q _{gs}	Gate-to-Source charge	—	2.3	—		
Q _{gd}	Gate-to-Drain("Miller") charge	—	2.1	—		
t _{d(on)}	Turn-on delay time	—	2.3	—	ns	V _{GS} = 10V, V _{DS} = 15V, R _{GEN} = 3.3Ω I _D = 5A
t _r	Rise time	—	7.5	—		
t _{d(off)}	Turn-Off delay time	—	21.8	—		
t _f	Fall time	—	3.9	—		
C _{iss}	Input capacitance	—	570	—	pF	V _{GS} = 0V V _{DS} = 15V f = 1MHz
C _{oss}	Output capacitance	—	80	—		
C _{rss}	Reverse transfer capacitance	—	62	—		

Source-Drain Ratings and Characteristics

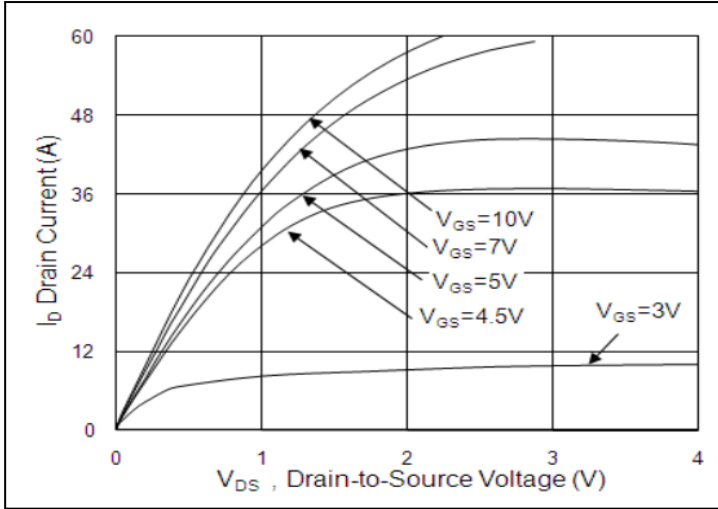
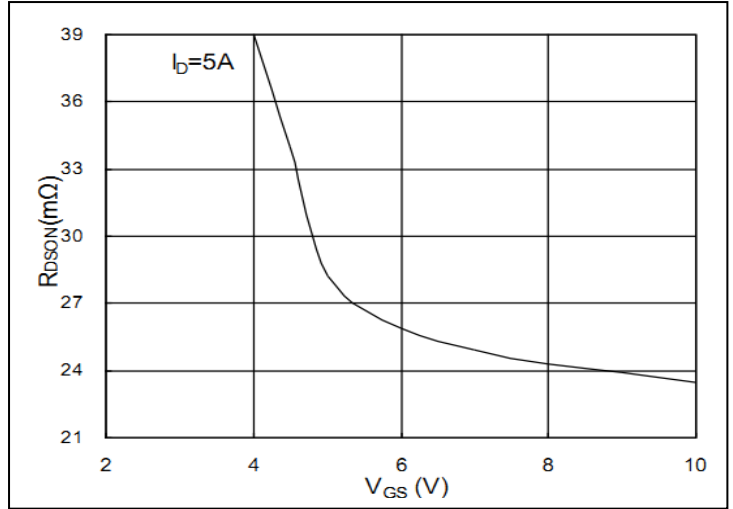
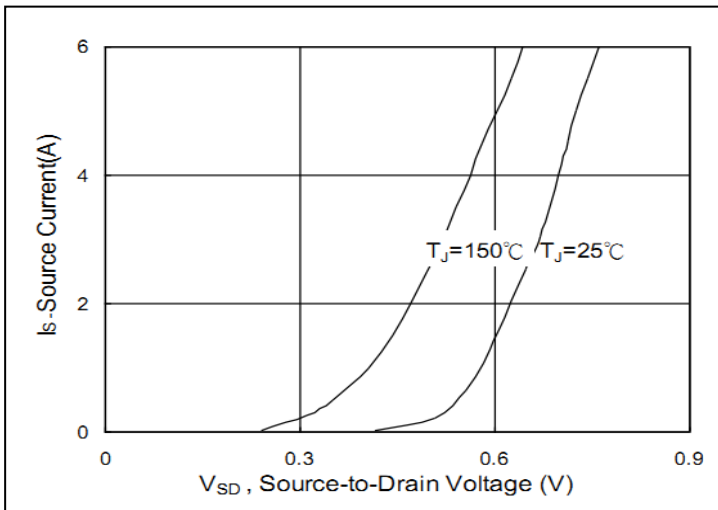
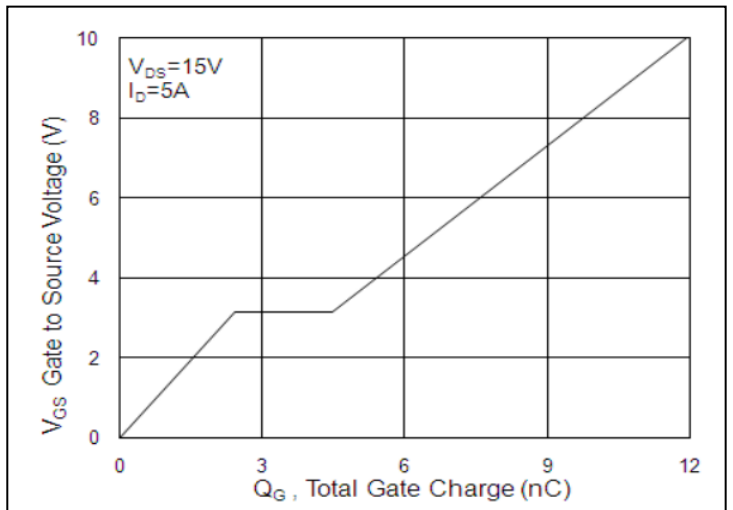
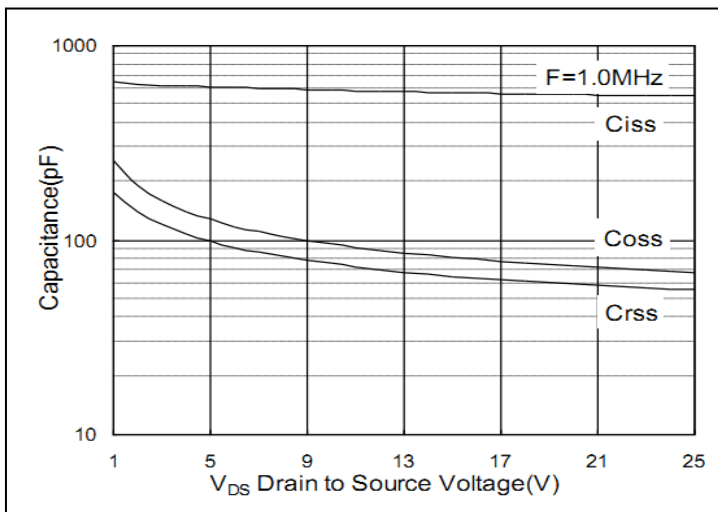
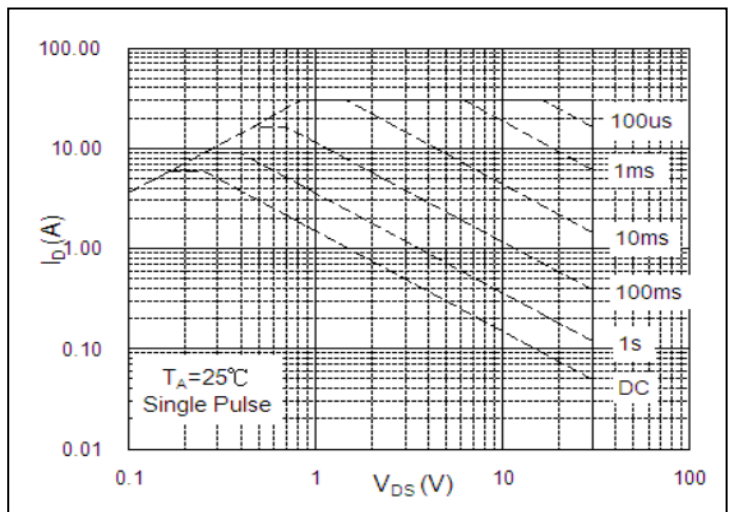
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode) ①	—	—	5.8	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	30		
V _{SD}	Diode Forward Voltage	—	—	1.2	V	I _S = 3A, V _{GS} = 0V
t _{rr}	Reverse Recovery Time	—	18	—	ns	I _S = 5A, di/dt = 100A/us
Q _{rr}	Reverse Recovery Charge	—	1.02	—	nC	

Test Circuits and Waveforms

EAS Test Circuit:

Gate charge test circuit:

Switching Time Test Circuit:

Switching Waveforms:


Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$

Typical Electrical and Thermal Characteristics

Figure 1. Typical Output Characteristics

Figure 2. On-Resistance vs. Gate-Source Voltage

Figure 3. Forward Characteristics of Reverse

Figure 4. Gate Charge Characteristics

Figure 5. Capacitance

Figure 6. Safe Operation Area

Typical Electrical and Thermal Characteristics

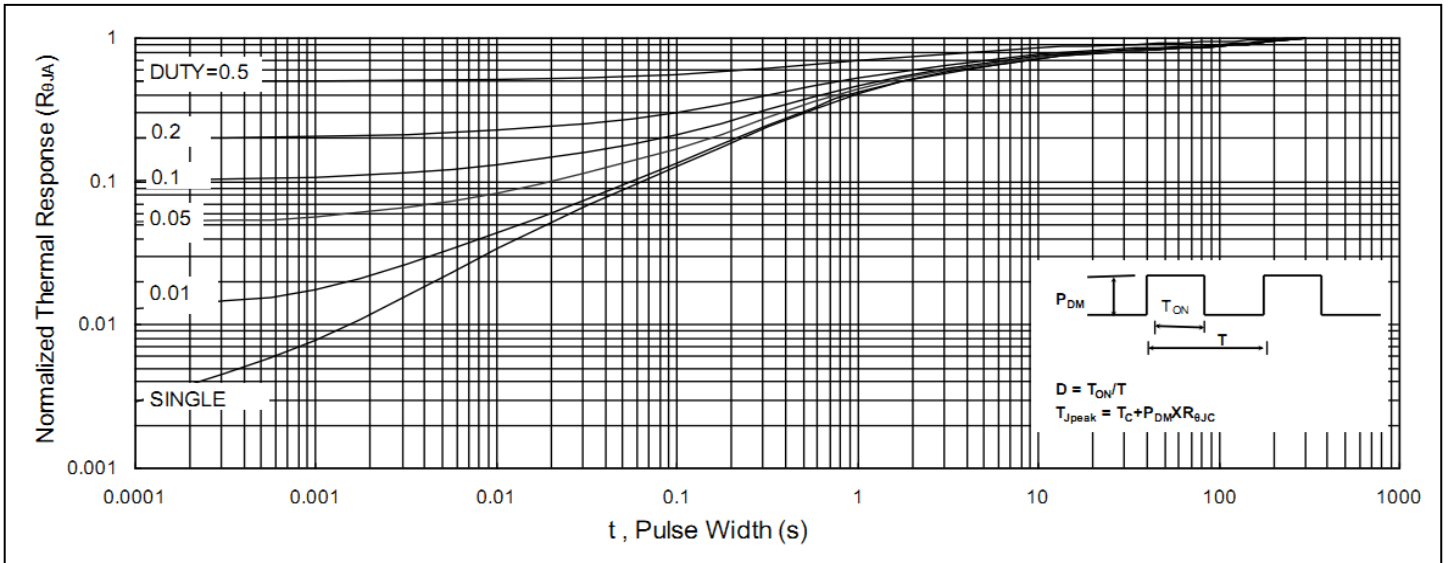
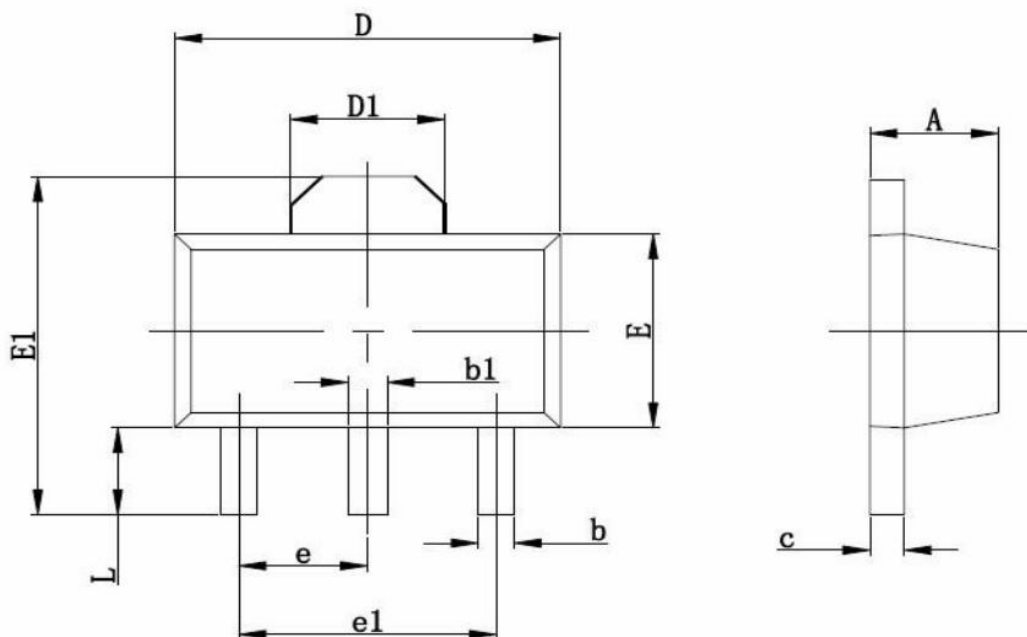


Figure 7. Transient Thermal Impedance

Mechanical Data:


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047

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