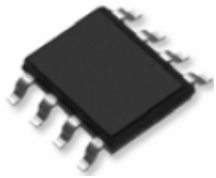
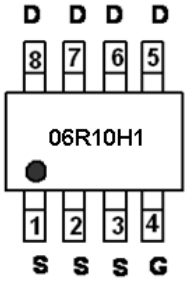
Main Product Characteristics:

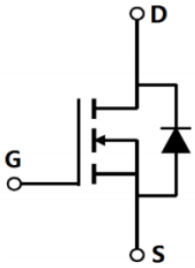
V_{DSS}	60V
R_{DS}(on)	7.5mΩ (typ.)
I_D	12A ①



SOP-8



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℃ 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 @ TC = 25°C	Continuous Drain Current ①	12	A
I_{DM}	Pulsed Drain Current ②	48	
P_D @TC = 25°C	Power Dissipation ③	4	W
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.3mH	30	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

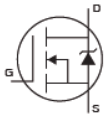
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	31	℃/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

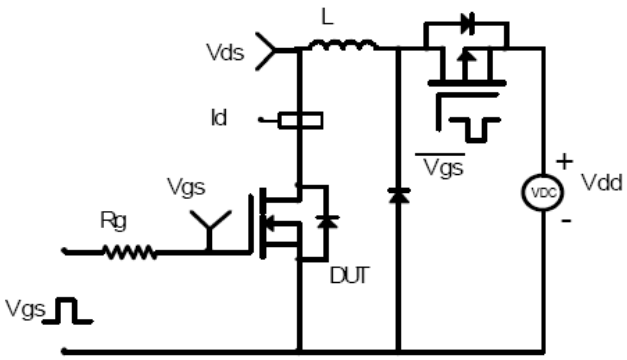
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	60	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	7.5	10	mΩ	V_{GS}=10V,I_D = 20A
		—	10	13	mΩ	V_{GS}=4.5V,I_D = 10A
$V_{GS(th)}$	Gate threshold voltage	1	—	2.5	V	V_{DS} = V_{GS}, I_D = 250μA
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 40V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} = 20V
		—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	18	—	nC	I_D = 10A,
Q_{gs}	Gate-to-Source charge	—	3.1	—		V_{DS}=50V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	3	—		V_{GS} = 10V
$t_{d(on)}$	Turn-on delay time	—	18	—	ns	V_{GS}=10V, V_{DS} =50V, R_{GEN}=2Ω,I_D =10A
t_r	Rise time	—	4	—		
$t_{d(off)}$	Turn-Off delay time	—	35	—		
t_f	Fall time	—	6	—		
C_{iss}	Input capacitance	—	1180	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	200	—		V_{DS} = 50V
C_{rss}	Reverse transfer capacitance	—	5	—		f = 100kHz

Source-Drain Ratings and Characteristics

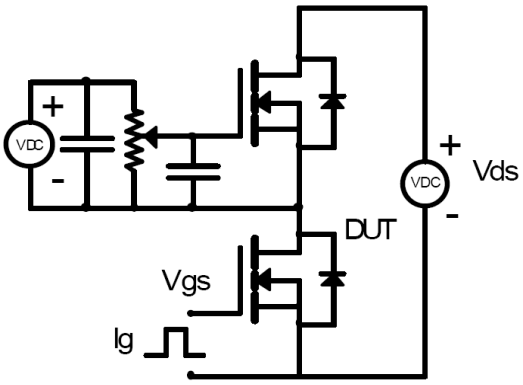
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	60 ①	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	180	A	
V_{sd}	Diode Forward Voltage	—	—	1.3	V	I_S=20A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	42	—	ns	T_J = 25°C, I_F =10A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	36	—	nC	

Test circuits and Waveforms

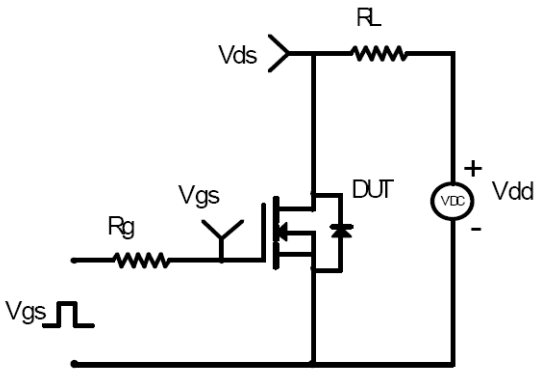
EAS Test Circuit:



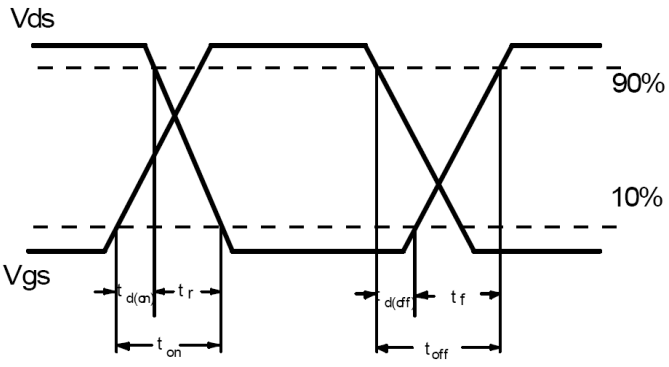
Gate charge test circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

①Calculated continuous current based on maximum allowable junction temperature.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The 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 TA =25°C

Typical electrical and thermal characteristics

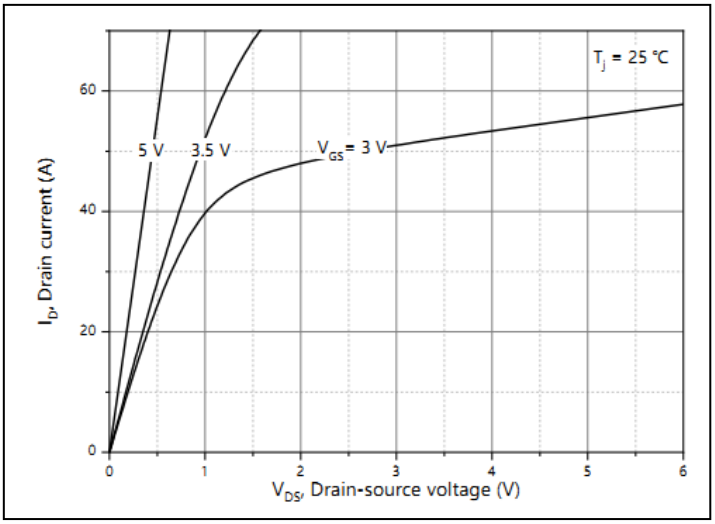


Figure 1: Typical Output Characteristics

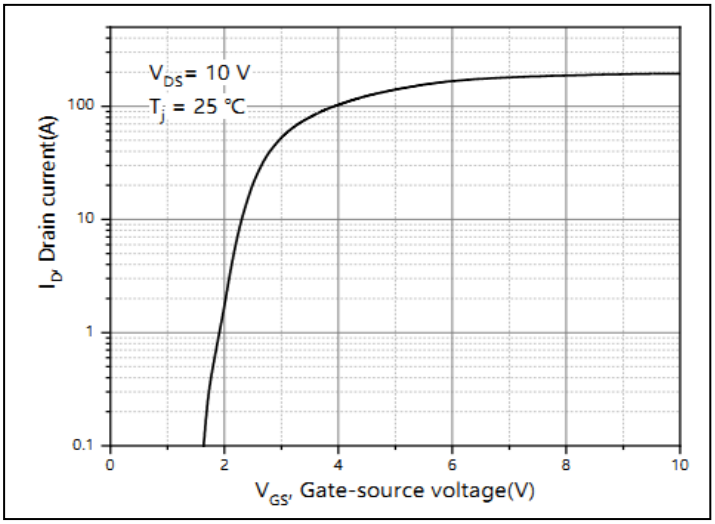


Figure 2: Typical Transfer Characteristics

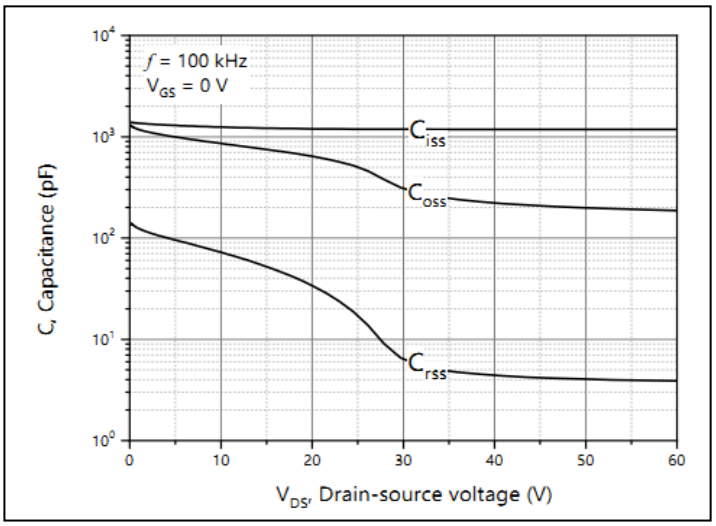


Figure 3: Capacitances

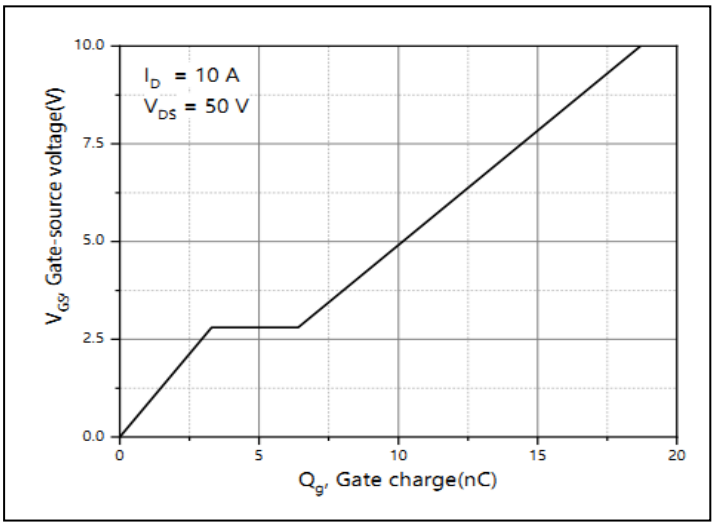


Figure 4: Gate Charge

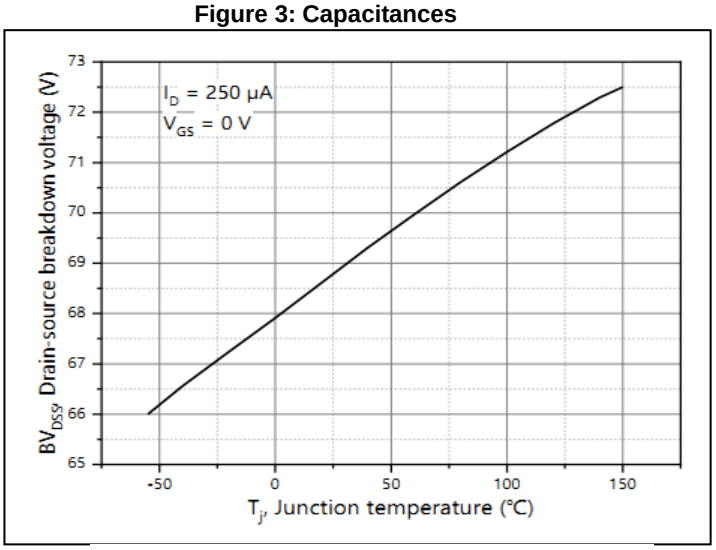


Figure 5: Drain-Source Breakdown Voltage

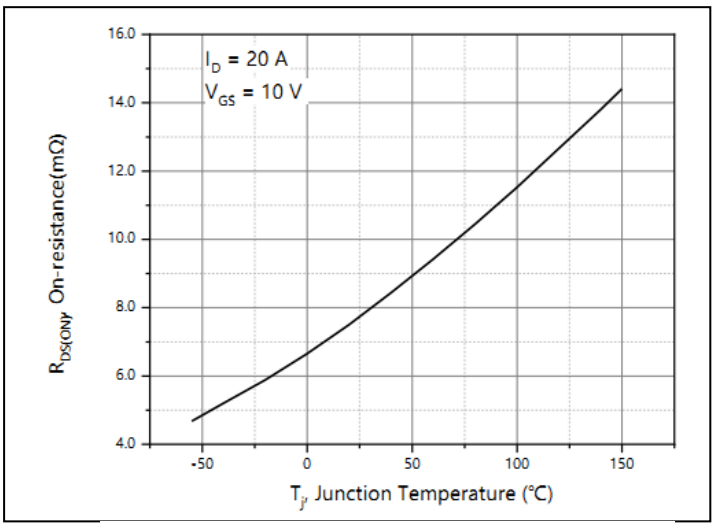


Figure 6: Drain-Source On-state Resistance

Typical electrical and thermal characteristics

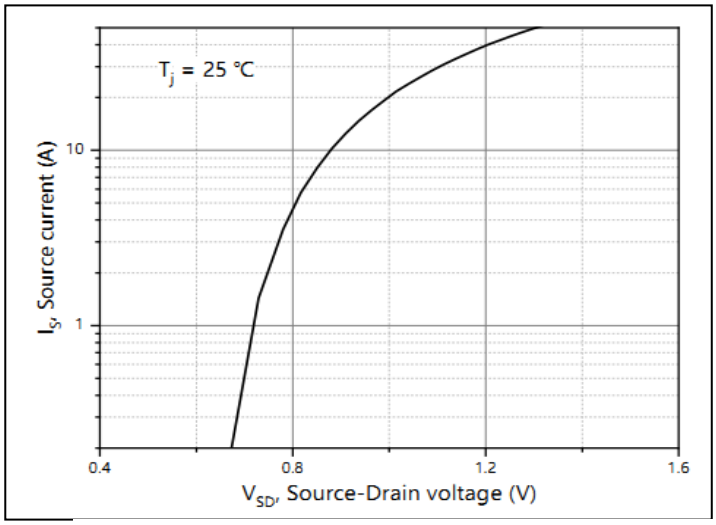


Figure 7: Forward Characteristic Of Body Diode

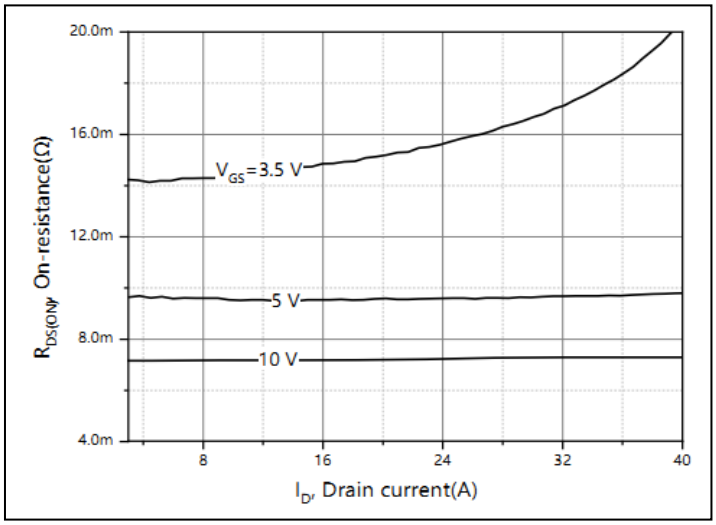


Figure 8: Drain-Source On-state Resistance

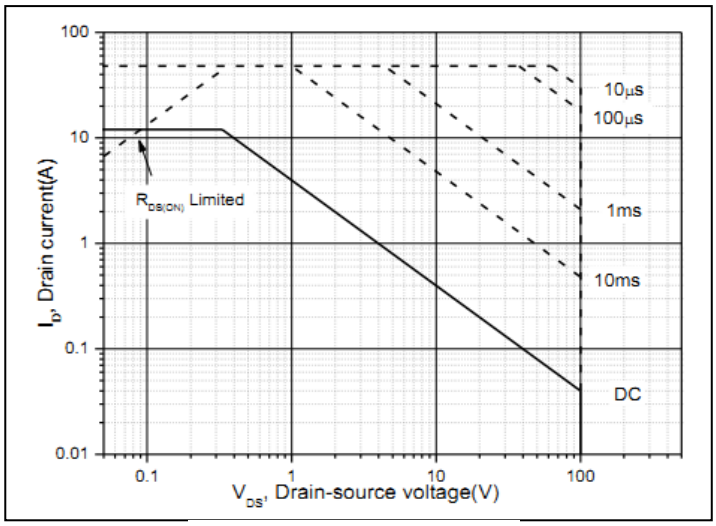
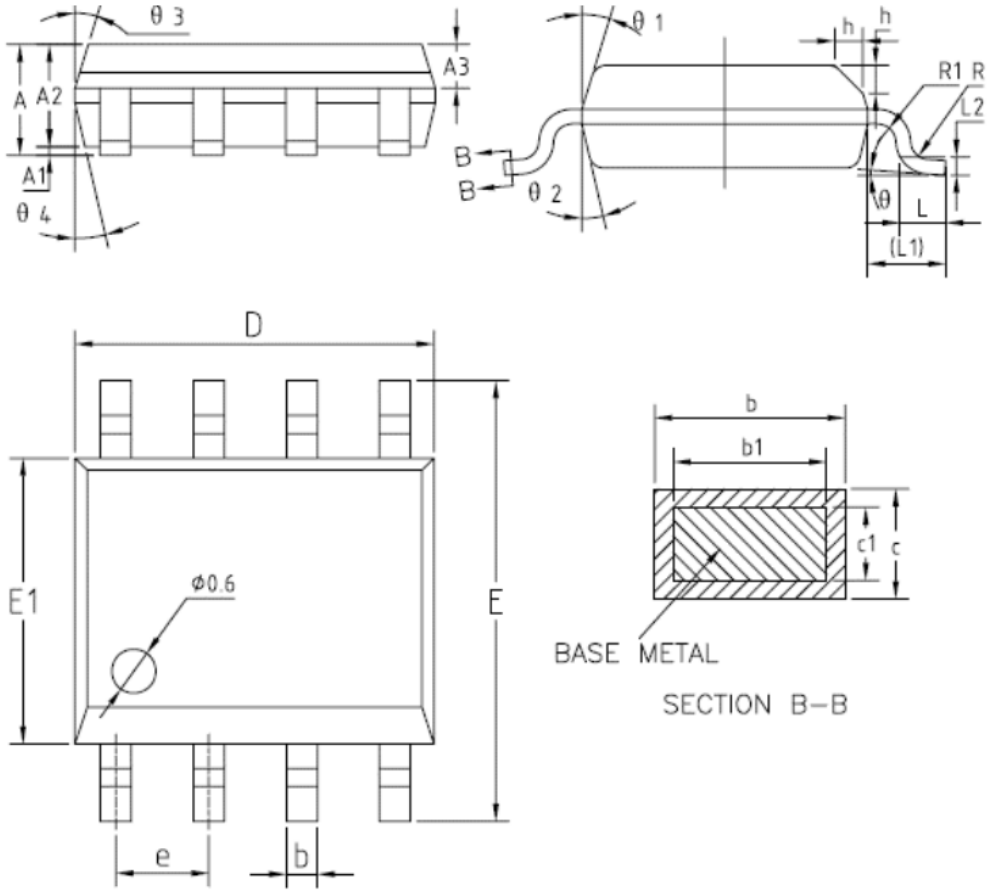


Figure 9: Safe Operation

Mechanical Data：



SYMBOL	mm		
	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.10	0.15	0.25
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.38	-	0.51
L1		1.04 REF.	
L2		0.25 BSC.	
b1	0.37	0.42	0.47
c	0.18	-	0.25
c1	0.17	0.20	0.23
D	4.80	4.90	5
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.17	1.27	1.37
L	0.45	0.60	0.80
R	0.07	-	-
R1	0.07	-	-
h	0.30	0.40	0.50
θ	0°	-	8°
θ1	15°	17°	19°
θ2	11°	13°	15°
θ3	15°	17°	19°
θ4	11°	13°	15°

Ordering and Marking Information

Device Marking: 06R10H1

Package (Available)

SOP-8

Operating Temperature Range

C : -55 to 150 ºC

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	T_j=125℃ to 150℃ @ 80% of Max V_{DSS}/V_{CES}/VR	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	T_j=150℃@ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices

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