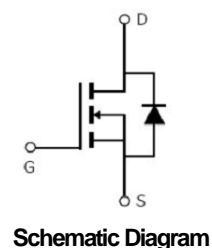
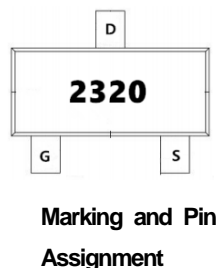


Main Product Characteristics

V_{DSS}	20V
$R_{DS(on)}$	8.5m Ω (typ.)
I_D	8A ①


Features and Benefits

- Advanced trench 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 trench 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	8	A
I_D @ TC = 100°C	Continuous Drain Current ①	4.5	
I_{DM}	Pulsed Drain Current ②	75	
P_D @TC = 25°C	Power Dissipation	12	W
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-to-Source Voltage	± 12	V
E_{AS}	Single Pulse Avalanche Energy	1	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

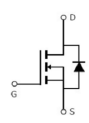
Thermal Resistance

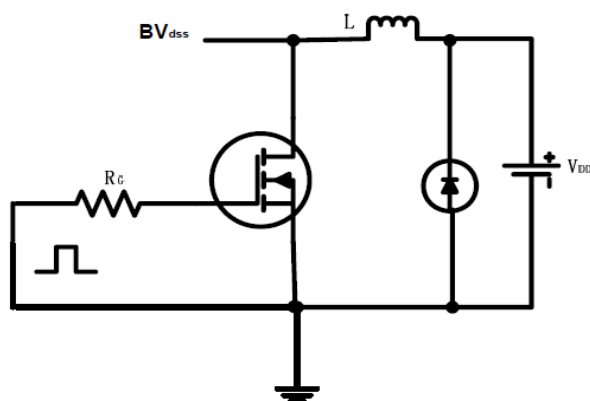
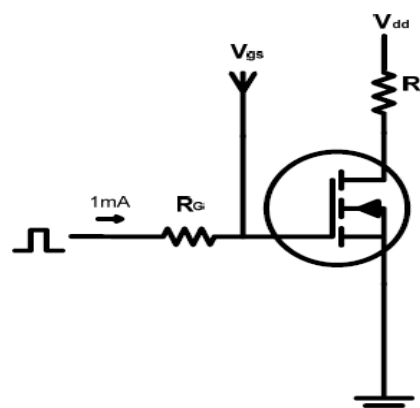
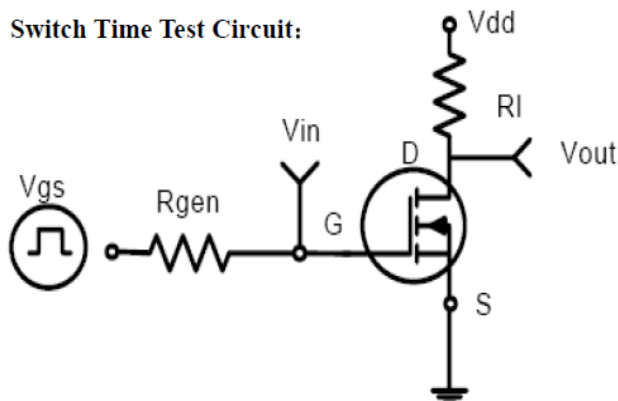
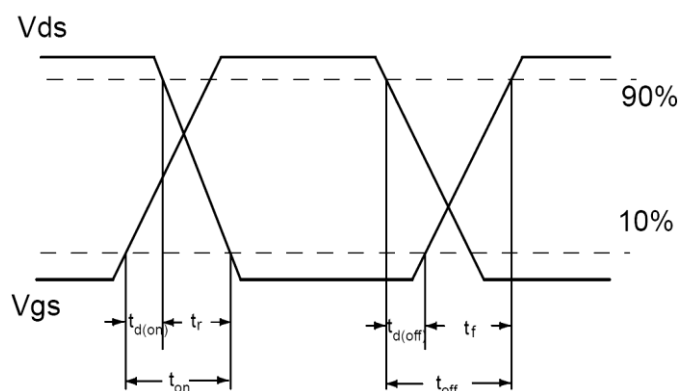
Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	3.8	°C/W

Electrical Characterizes @ $T_A=25^\circ\text{C}$ unless otherwise specified

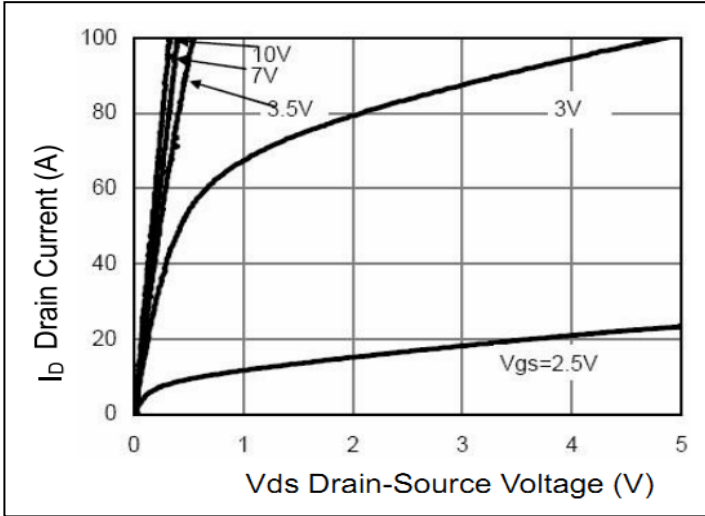
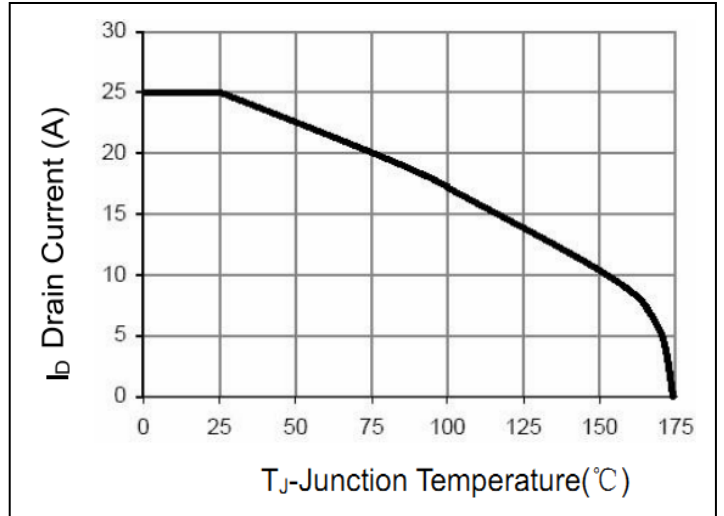
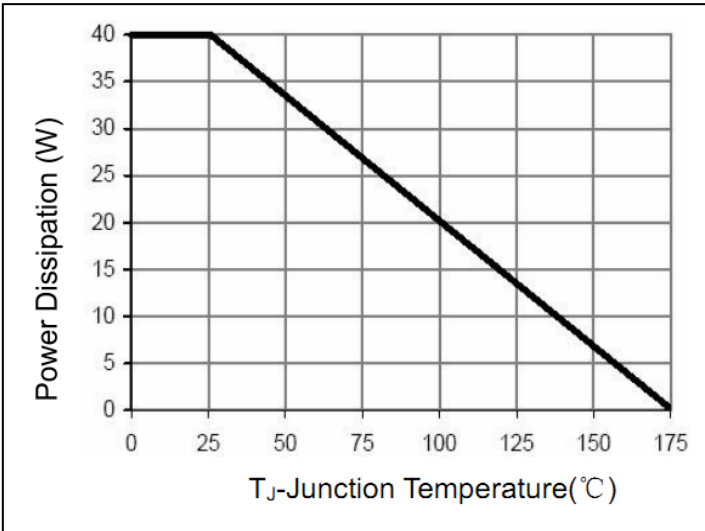
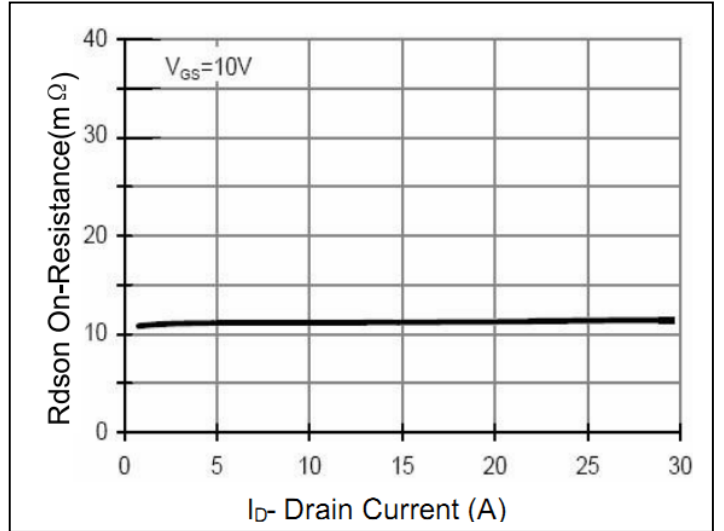
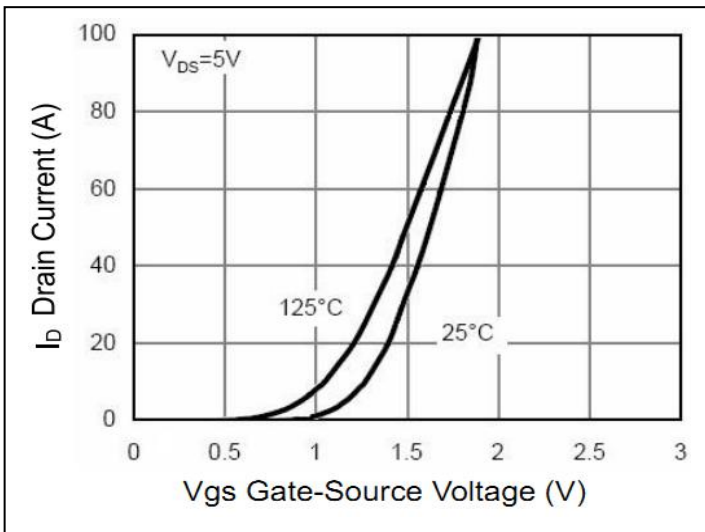
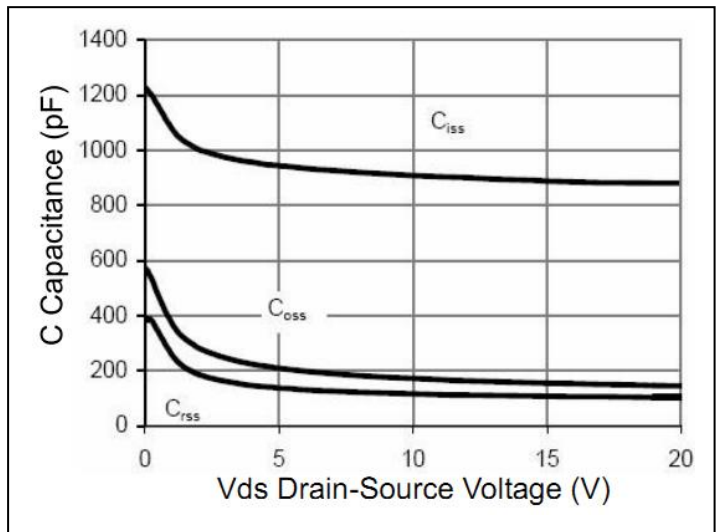
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	20	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	8.5	12	m Ω	$V_{GS} = 4.5V, I_D = 6A$
		—	—	15		$V_{GS} = 2.5V, I_D = 3A$
$V_{GS(th)}$	Gate threshold voltage	0.5	—	1.2	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 20V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 12V$
		—	—	-100		$V_{GS} = -12V$
Q_g	Total gate charge	—	15	—	nC	$I_D = 20A,$ $V_{DS} = 10V,$ $V_{GS} = 10V$
Q_{gs}	Gate-to-Source charge	—	1.7	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	2.8	—		
$t_{d(on)}$	Turn-on delay time	—	4.3	—	ns	$V_{GS} = 10V, V_{DS} = 10V,$ $R_{GEN} = 3\Omega, R_L = 0.5\Omega$
t_r	Rise time	—	8.9	—		
$t_{d(off)}$	Turn-Off delay time	—	18.5	—		
t_f	Fall time	—	3.1	—		
C_{iss}	Input capacitance	—	623	—	pF	$V_{GS} = 0V,$ $V_{DS} = 10V,$ $f = 1MHz$
C_{oss}	Output capacitance	—	160	—		
C_{riss}	Reverse transfer capacitance	—	103	—		

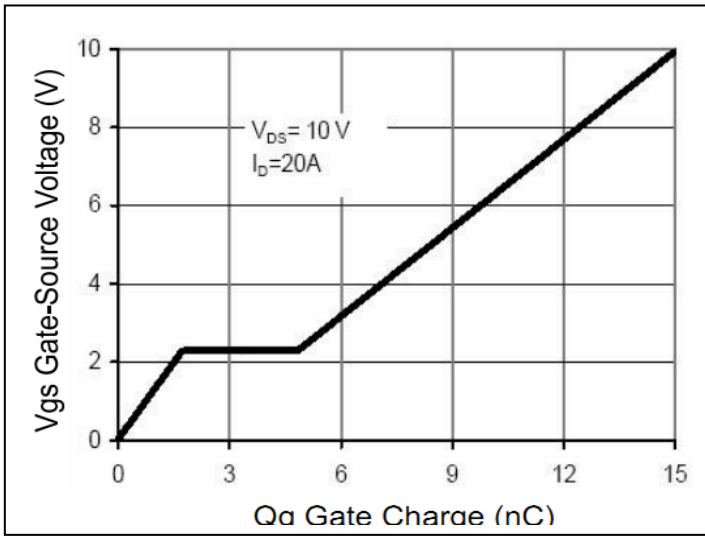
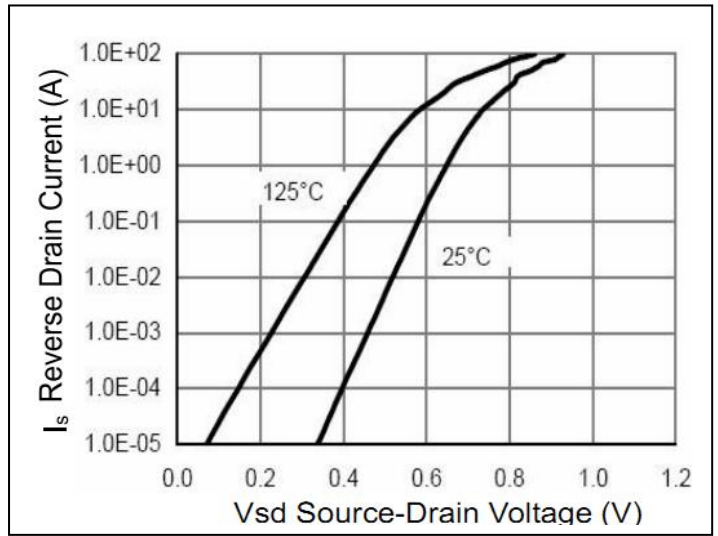
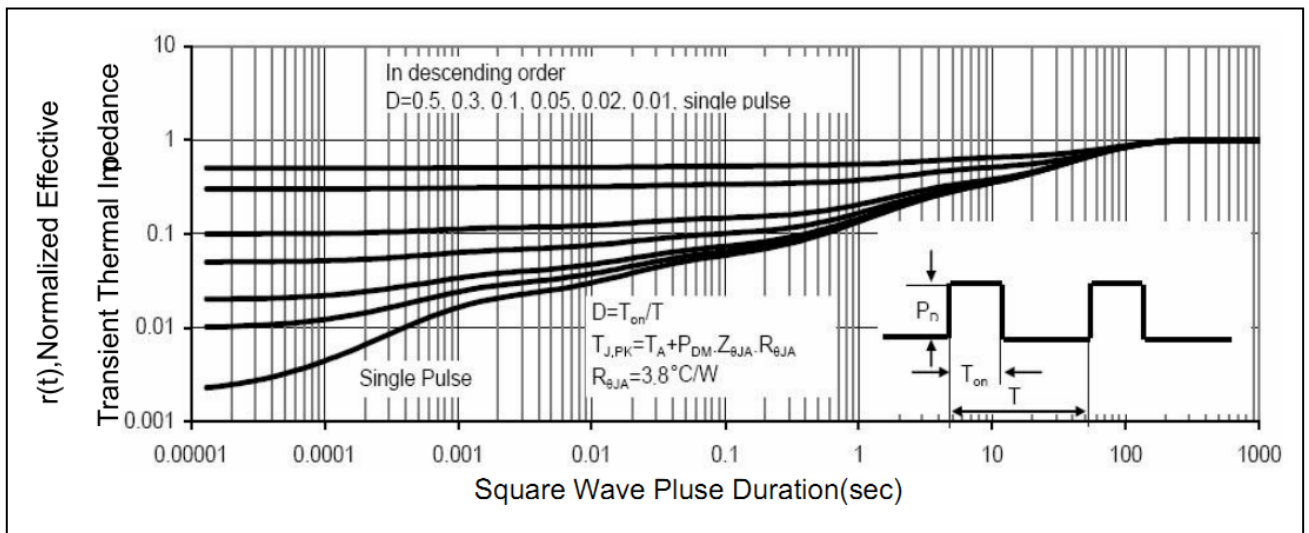
Source-Drain Ratings and Characteristics

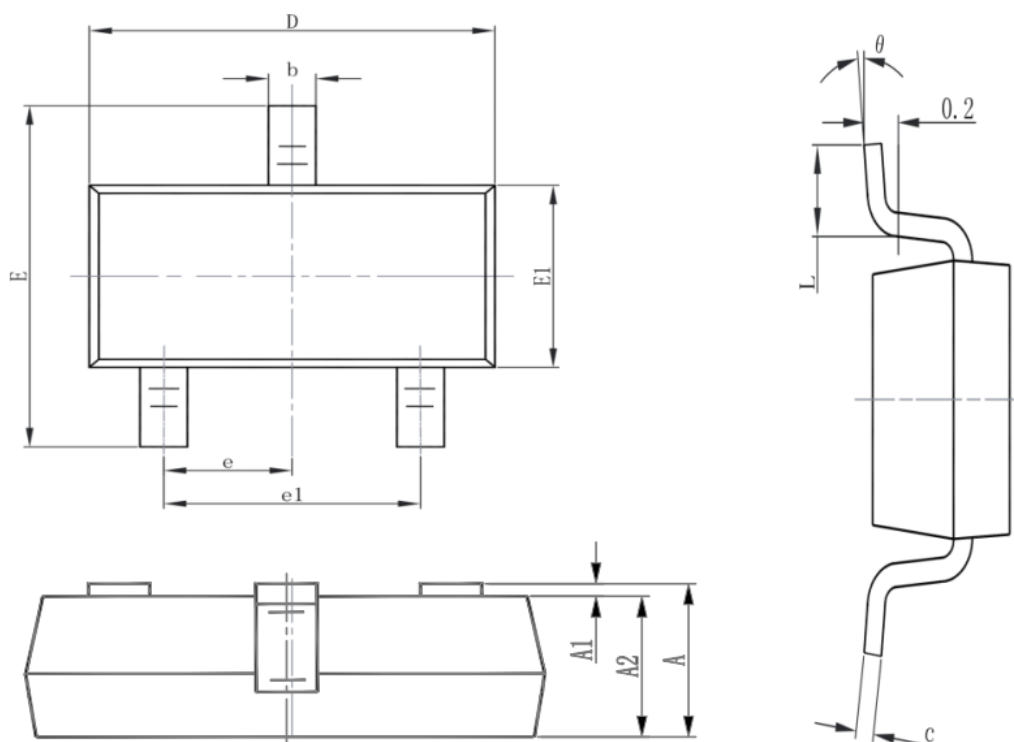
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	25	A	MOSFET symbol showing the integral reverse p-n junction diode. 
V_{SD}	Diode Forward Voltage	—	—	1.2	V	$I_S = 25A, V_{GS} = 0V$
t_{rr}	Reverse Recovery Time	—	18	—	ns	$I_S = 20A, di/dt = 100A/\mu s$
Q_{rr}	Reverse Recovery Charge	—	9.5	—	nC	

Test Circuits and Waveforms
EAS test circuits:

Gate charge test circuit:

Switch Time Test Circuit:

Switch Waveforms:

Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max junction temperature.
- ③ 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. Output Characteristics

Figure 2. Drain Current vs. Junction Temperature

Figure 3. Power Dissipation

Figure 4. Drain Current vs. On-Resistance

Figure 5. Transfer Characteristics

Figure 6. Capacitance

Typical Electrical and Thermal Characteristics

Figure 7. Gate Charge

Figure 8. Forward Characteristics Of Reverse

Figure 9. Maximum Effective Transient Thermal Impedance

Mechanical Data:


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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