Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

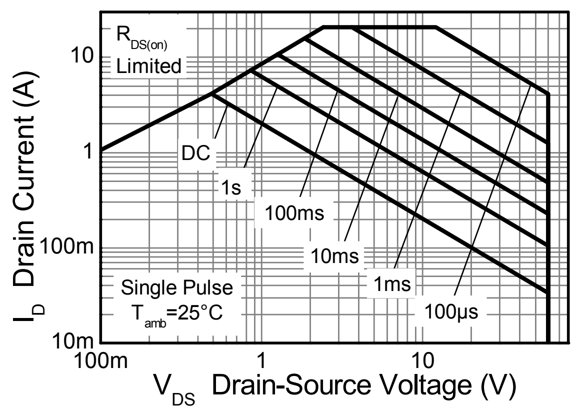
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V_{DSS}	60	V
Gate-Source voltage		(Note 6)	V_{GS}	±20	V
Single Pulsed Avalanche Energy		(Note 11)	E_{AS}	37.5	mJ
Single Pulsed Avalanche Current		(Note 11)	I_{AS}	5.0	A
Continuous Drain current	V_{GS} = 10V	(Note 8)	I_D	5.6	A
		T_A = +70°C (Note 8)		4.5	
		(Note 7)		4.1	
Pulsed Drain current	V_{GS}= 10V	(Note 9)	I_{DM}	20.8	A
Continuous Source current (Body diode)		(Note 8)	I_S	4.9	A
Pulsed Source current (Body diode)		(Note 9)	I_{SM}	20.8	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

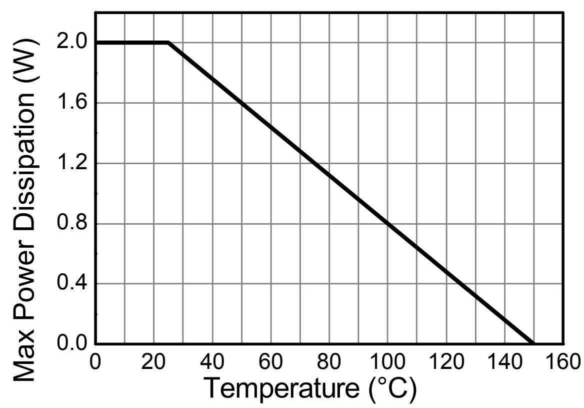
Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Note 7)	P_D	2.0 16.0	W mW/°C
	(Note 8)		3.7 29.5	
Thermal Resistance, Junction to Ambient	(Note 7)	$R_{\theta JA}$	62.5	°C/W
	(Note 8)		34	
Thermal Resistance, Junction to Lead	(Note 10)	$R_{\theta JL}$	11.5	
Operating and storage temperature range		T_J, T_{STG}	-55 to +150	°C

Notes:
6. AEC-Q101 V_{GS} maximum is ±16V.
7. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
8. Same as note (3), except the device is measured at t ≤ 10 sec.
9. Same as note (3), except the device is pulsed with D= 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.
10. Thermal resistance from junction to solder-point (at the end of the drain lead).
11. UIS in production with L = 3.0mH, I_{AS} = 5.0A, R_G = 25Ω, V_{DD}=50V, starting T_J = +25°C.

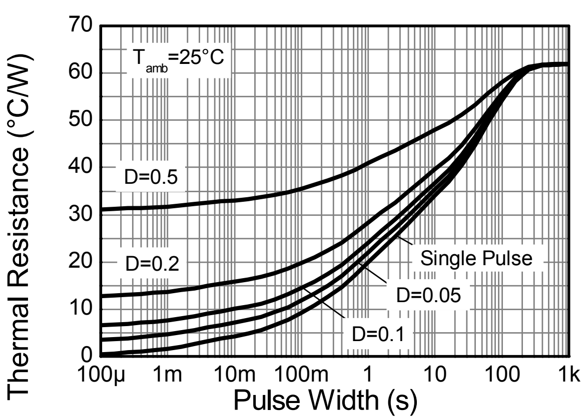
Thermal Characteristics



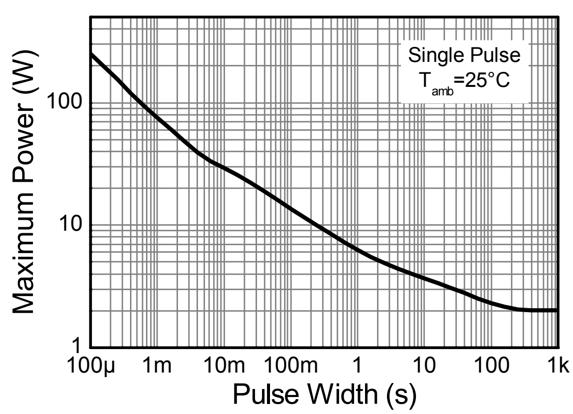
Safe Operating Area



Derating Curve



Transient Thermal Impedance



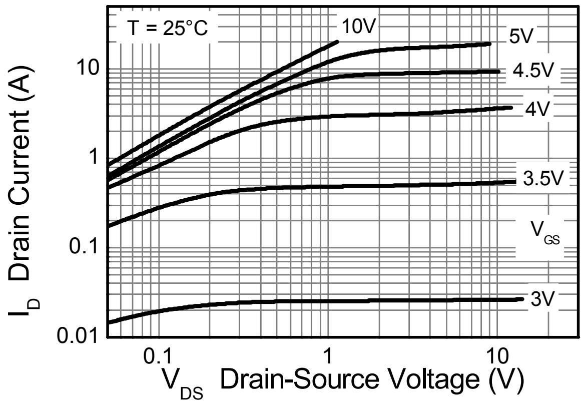
Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

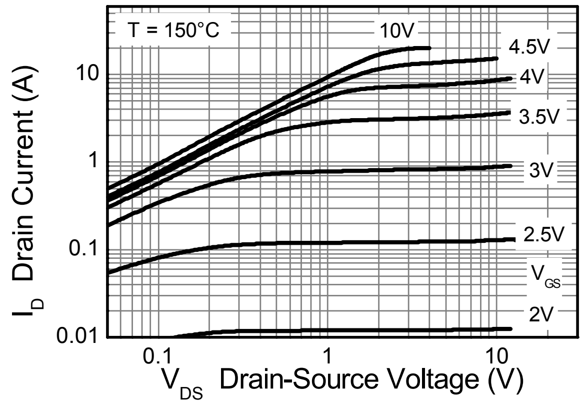
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	I_D = 250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	μA	V_{DS} = 60V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	3.0	V	I_D = 250μA, V_{DS}= V_{GS}
Static Drain-Source On-Resistance (Note 12)	$R_{DS\ (ON)}$	—	—	0.068	Ω	V_{GS} = 10V, I_D = 12A
				0.100		V_{GS} = 4.5V, I_D = 6A
Forward Transconductance (Notes 12 & 13)	g_{fs}	—	19.7	—	S	V_{DS} = 15V, I_D = 12A
Diode Forward Voltage (Note 12)	V_{SD}	—	0.98	1.15	V	I_S = 12A, V_{GS} = 0V
Reverse recovery time (Note 13)	t_{rr}		145	—	ns	I_S = 12A, di/dt= 100A/μs
Reverse recovery charge (Note 13)	Q_{rr}	—	929	—	nC	
DYNAMIC CHARACTERISTICS (Note 13)						
Input Capacitance	C_{iss}	—	502	—	pF	V_{DS} = 30V, V_{GS} = 0V f= 1MHz
Output Capacitance	C_{oss}	—	45.7	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	27.1	—	pF	
Total Gate Charge (Note 14)	Q_g	—	5.55	—	nC	V_{GS} = 4.5V; V_{DS} = 30V, I_D = 12A
Total Gate Charge (Note 14)	Q_g	—	10.3	—	nC	V_{GS} = 10V
Gate-Source Charge (Note 14)	Q_{gs}	—	1.6	—	nC	
Gate-Drain Charge(Note 14)	Q_{gd}	—	3.5	—	nC	
Turn-On Delay Time (Note 14)	$t_{D(on)}$	—	3.6	—	ns	V_{DD} = 30V, V_{GS}= 10V I_D = 12A, $R_G \cong$ 6.0Ω
Turn-On Rise Time (Note 14)	t_r	—	10.8	—	ns	
Turn-Off Delay Time (Note 14)	$t_{D(off)}$	—	11.9	—	ns	
Turn-Off Fall Time (Note 14)	t_f	—	8.7	—	ns	

Notes: 12. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
13. For design aid only, not subject to production testing.
14. Switching characteristics are independent of operating junction temperatures.

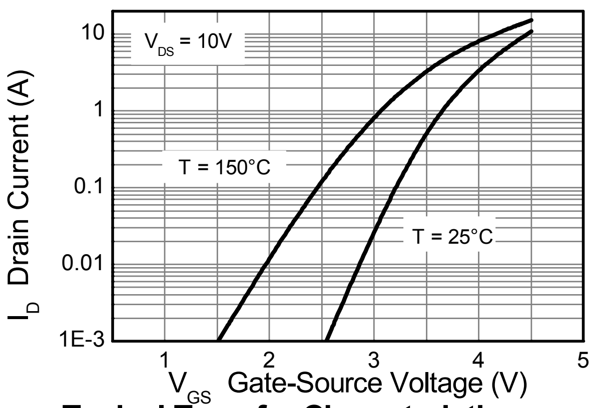
Typical Characteristics



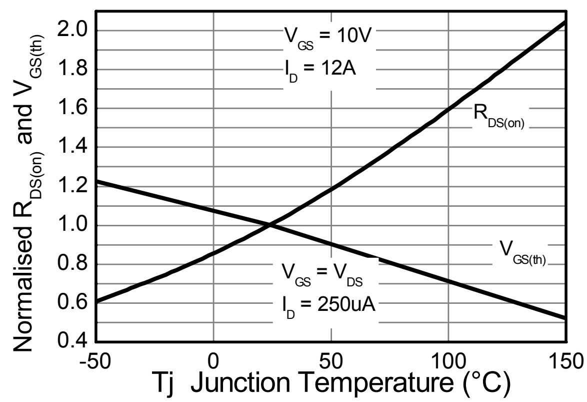
Output Characteristics



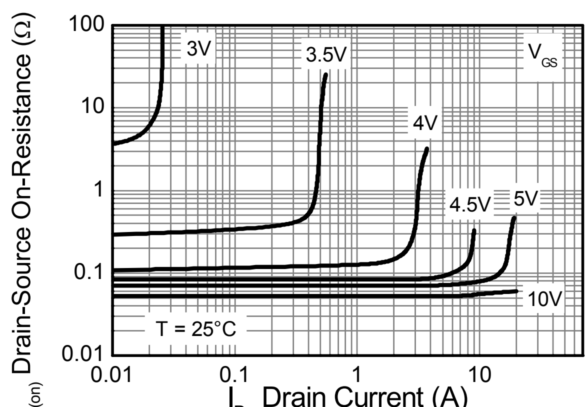
Output Characteristics



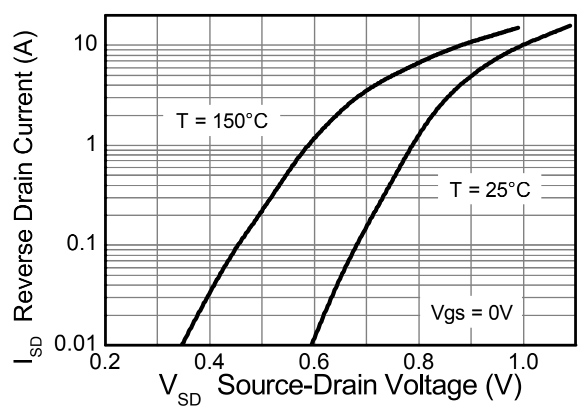
Typical Transfer Characteristics



Normalised Curves v Temperature

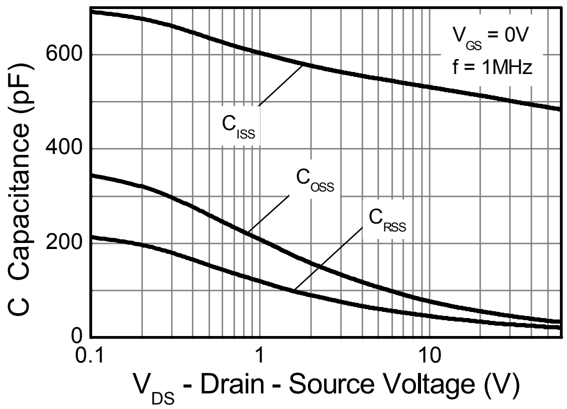


On-Resistance v Drain Current

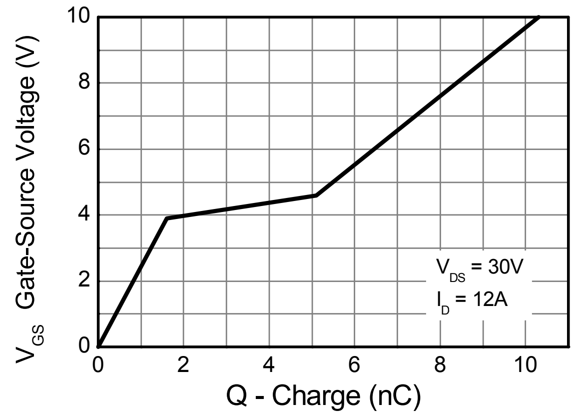


Source-Drain Diode Forward Voltage

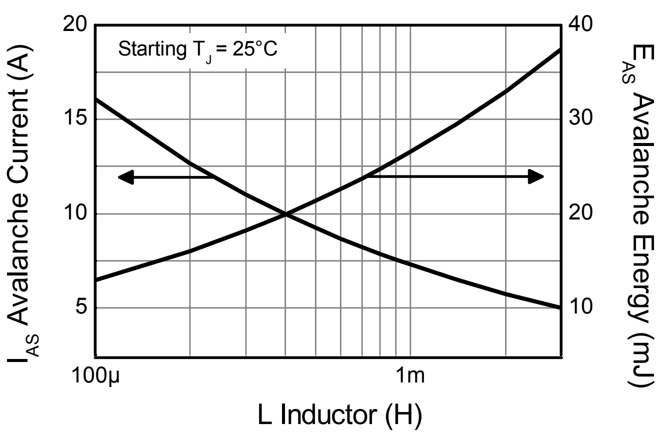
Typical Characteristics (cont.)



Capacitance v Drain-Source Voltage

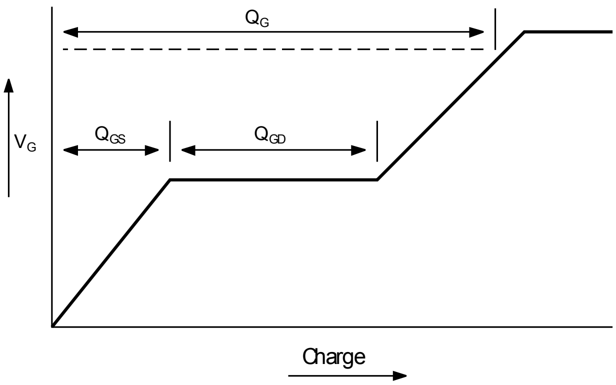


Gate-Source Voltage v Gate Charge

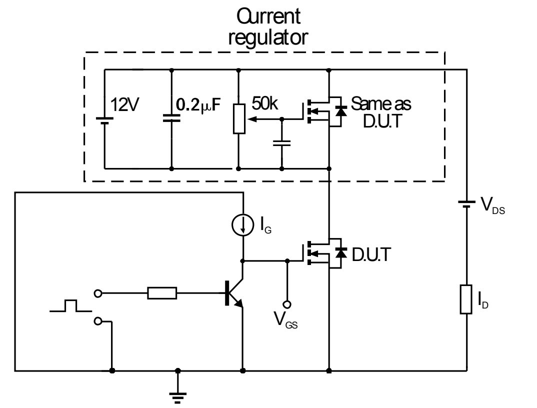


Single-Pulsed Avalanche Rating

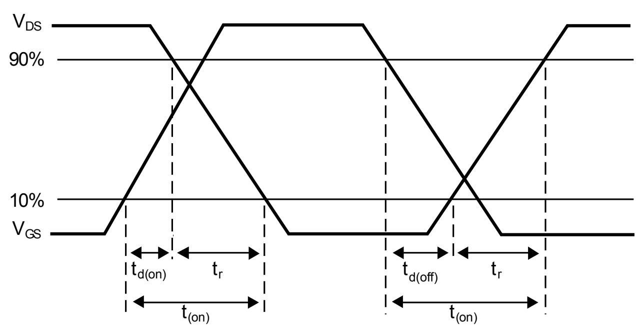
Test Circuits



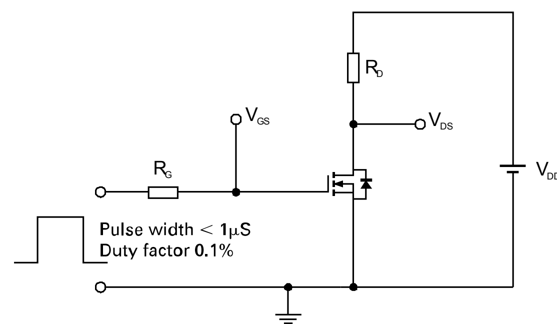
Basic gate charge waveform



Gate charge test circuit



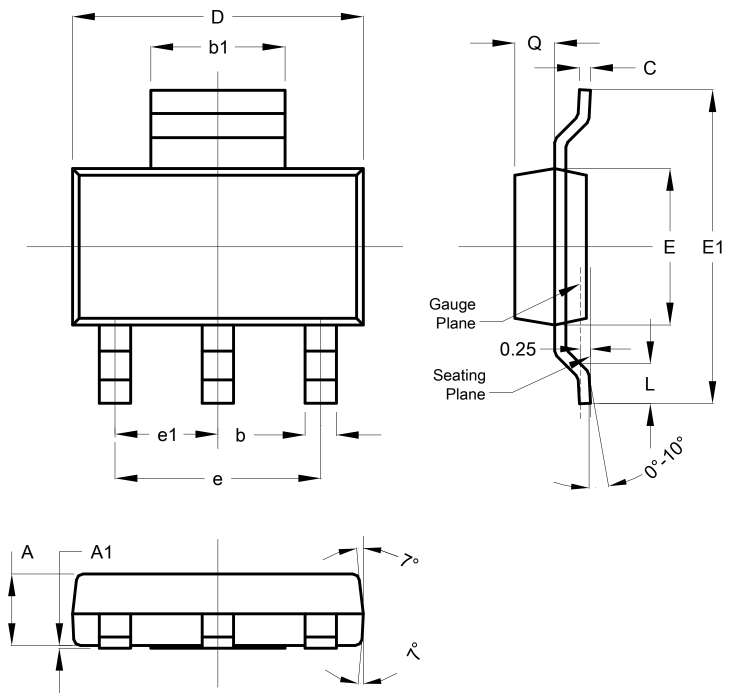
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

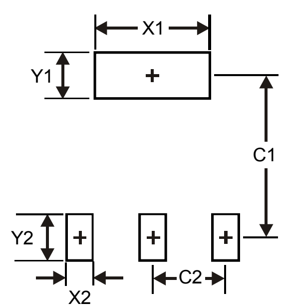
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3

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