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

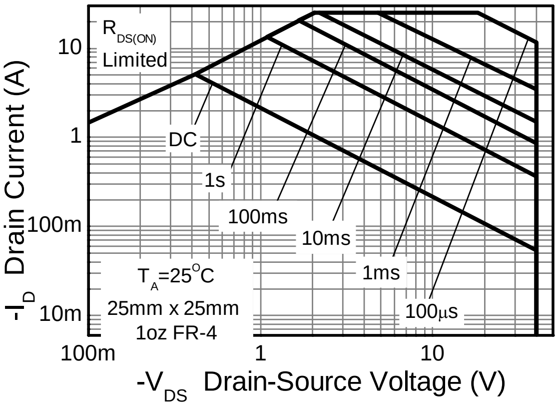
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-40	V
Gate-Source Voltage		(Note 6)	V_{GS}	±20	V
Single Pulsed Avalanche Energy		(Note 12)	E_{AS}	50	mJ
Single Pulsed Avalanche Current		(Note 12)	I_{AS}	-20.3	A
Continuous Drain Current	V_{GS} = -10V	(Note 8)	I_D	-10.5	A
		T_A = +70°C (Note 8)		-8.40	
		(Note 7)		-7.2	
Pulsed Drain Current	V_{GS} = -10V	(Note 9)	I_{DM}	-28.9	A
Continuous Source Current (Body Diode)		(Note 8)	I_S	-10.1	A
Pulsed Source Current (Body Diode)		(Note 8)	I_{SM}	-28.9	A

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

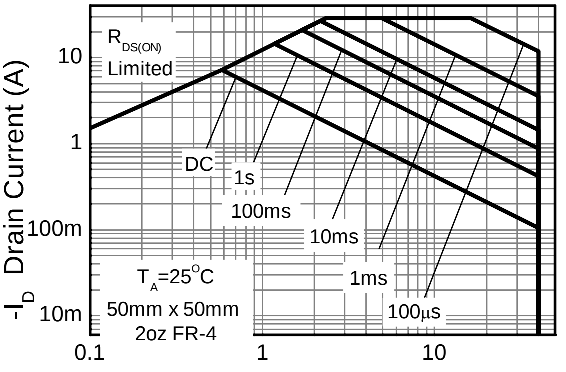
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 7)	P_D	4.18 33.4	W mW/°C
	(Note 8)		8.9 71.4	
	(Note 10)		2.14 17.1	
Thermal Resistance, Junction to Ambient	(Note 7)	$R_{\theta JA}$	29.9	°C/W
	(Note 8)		14.0	
	(Note 10)		58.4	
Thermal Resistance, Junction to Lead	(Note 11)	$R_{\theta JL}$	2.46	
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 50mm x 50mm x 1.6mm FR-4 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 7, except the device is measured at t ≤ 10s.
9. Same as note 7, except the device is pulsed with D = 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.
10. For a device surface mounted on 25mm x 25mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
11. Thermal resistance from junction to solder-point (at the end of the drain lead).
12. UIS in production with L = 100µH, V_{DD} = -40V.

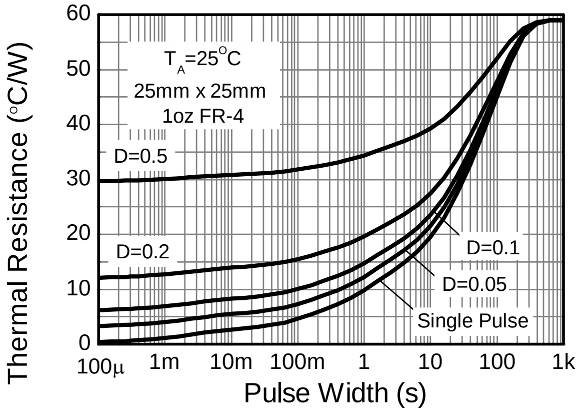
Thermal Characteristics



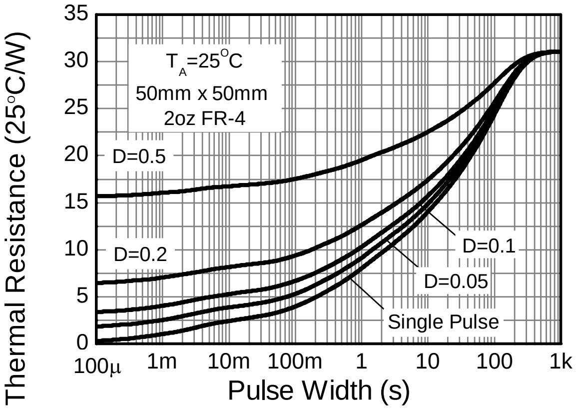
Safe Operating Area



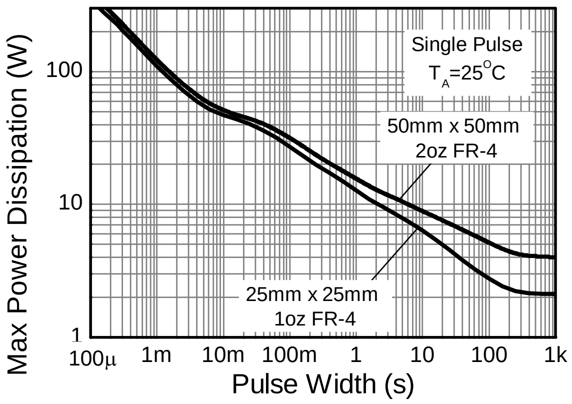
Safe Operating Area



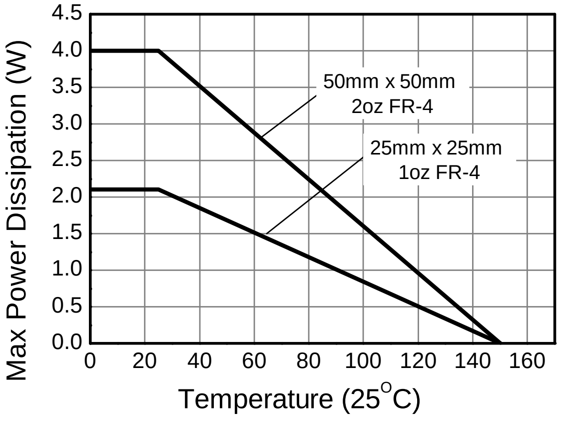
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



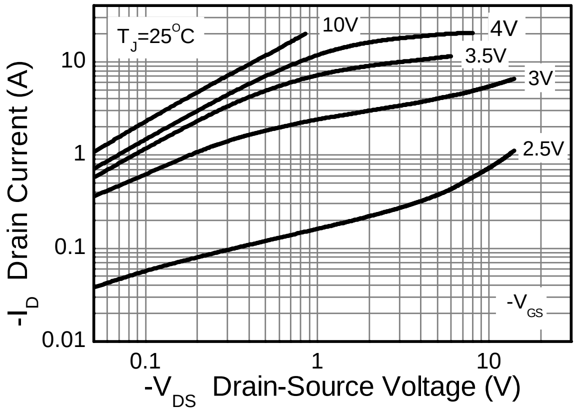
Derating Curve

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

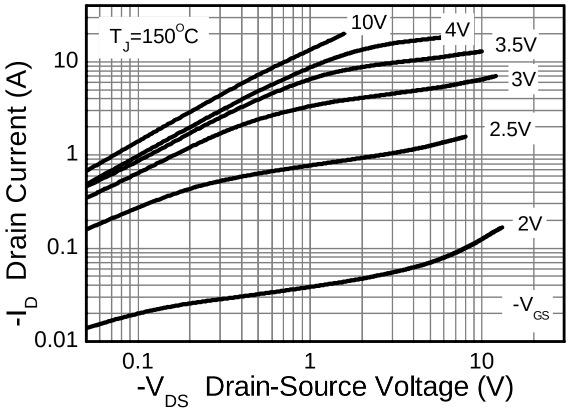
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	-40	—	—	V	I_D = -250µA, V_{GS} = 0V	
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-0.5	µA	V_{DS} = -40V, V_{GS} = 0V	
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 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 14)	$R_{DS(ON)}$	—	0.041	0.051	Ω	V_{GS} = -10V, I_D = -12A	
			0.059	0.085		V_{GS} = -4.5V, I_D = -8A	
Forward Transconductance (Notes 13 & 14)	g_{fs}	—	16.6	—	s	V_{DS} = -15V, I_D = -12A	
Diode Forward Voltage (Note 13)	V_{SD}	—	-0.98	-1.2	V	I_S = -12A, V_{GS} = 0V	
Reverse Recovery Time (Note 14)	t_{rr}		138	—	ns	I_S = -12A, di/dt = 100A/µs	
Reverse Recovery Charge (Note 13)	Q_{rr}	—	841	—	nC		
DYNAMIC CHARACTERISTICS (Note 14)							
Input Capacitance	C_{ISS}	—	674	—	pF	V_{DS} = -20V, V_{GS} = 0V f = 1MHz	
Output Capacitance	C_{OSS}	—	115	—	pF		
Reverse Transfer Capacitance	C_{RSS}	—	67.7	—	pF		
Total Gate Charge (Note 15)	Q_G	—	7.0	—	nC	V_{GS} = -4.5V	V_{DS} = -20V I_D = -12A
Total Gate Charge (Note 15)	Q_G	—	14	—	nC	V_{GS} = -10V	
Gate-Source Charge (Note 15)	Q_{GS}	—	2.2	—	nC		
Gate-Drain Charge (Note 15)	Q_{GD}	—	3.7	—	nC		
Turn-On Delay Time (Note 15)	$t_{d(on)}$	—	2.3	—	ns	V_{DD} = -20V, V_{GS} = -10V I_D = -12A, R_G ≅ 6.0Ω	
Turn-On Rise Time (Note 15)	t_r	—	14.1	—	ns		
Turn-Off Delay Time (Note 15)	$t_{d(off)}$	—	25.1	—	ns		
Turn-Off Fall Time (Note 15)	t_f	—	14.3	—	ns		

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

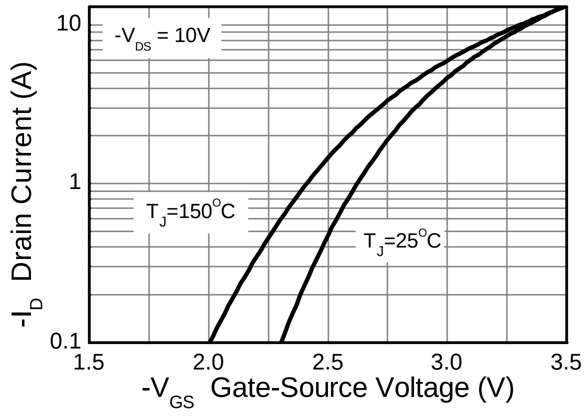
Typical Characteristics



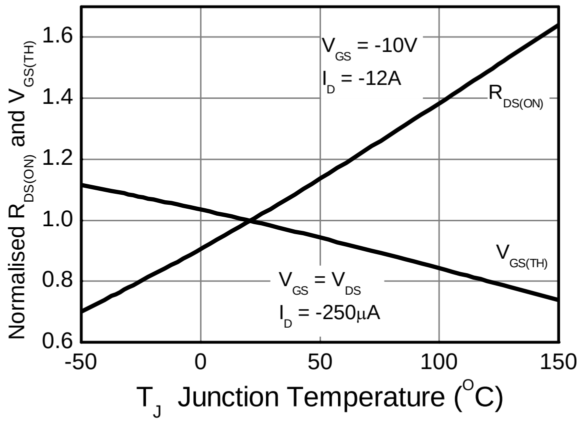
Output Characteristics



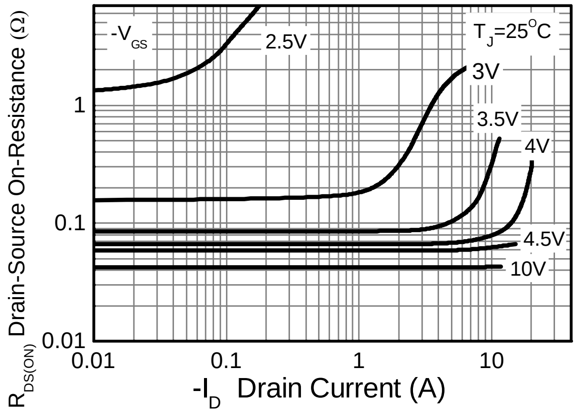
Output Characteristics



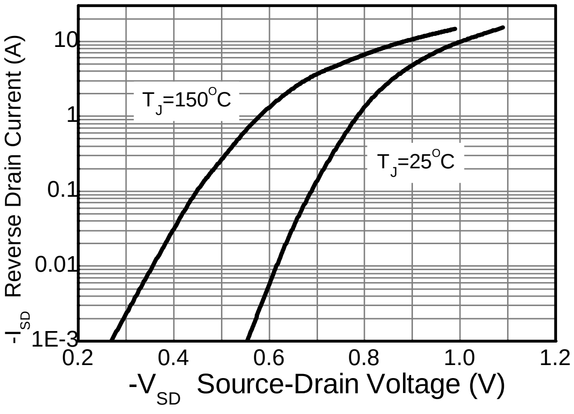
Typical Transfer Characteristics



Normalised Curves v Temperature

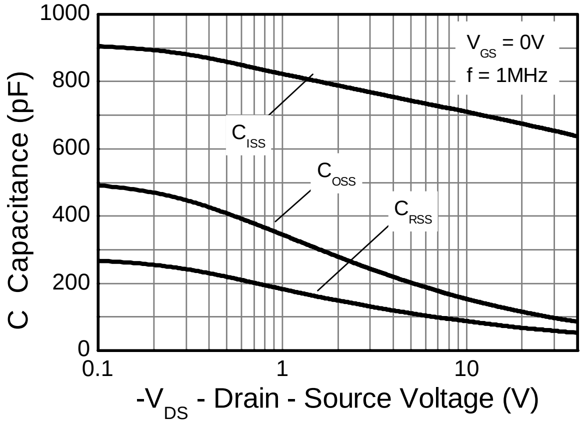


On-Resistance v Drain Current

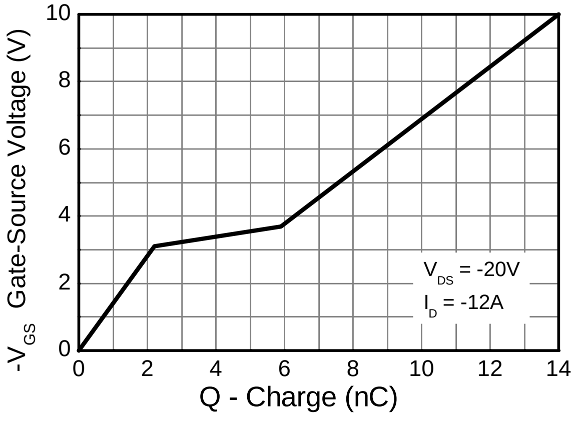


Source-Drain Diode Forward Voltage

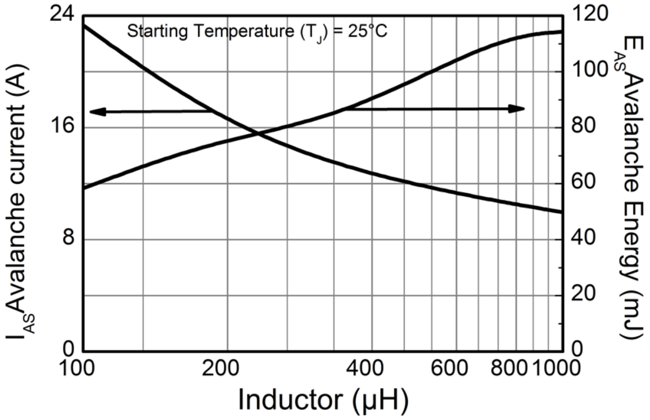
Typical Characteristics (Cont.)



Capacitance v Drain-Source Voltage

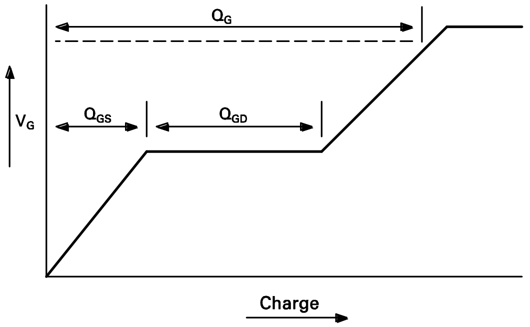


Gate-Source Voltage v Gate Charge

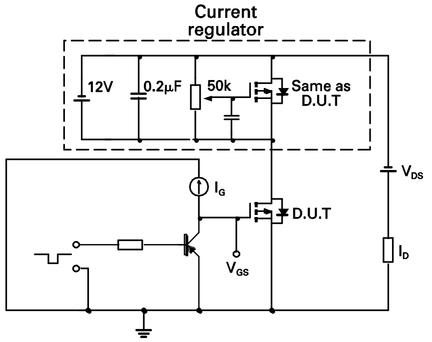


Single-pulse avalanche rating

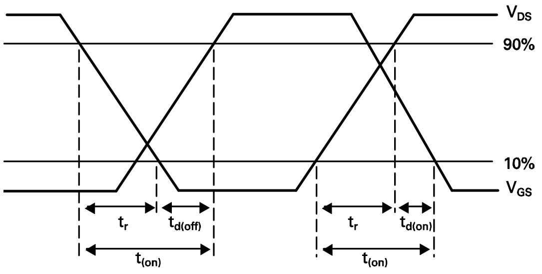
Test Circuits



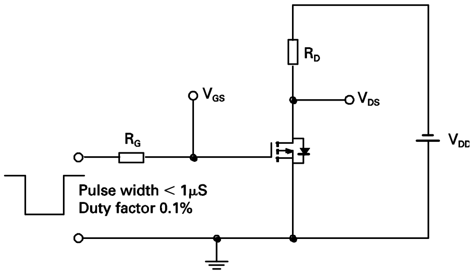
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

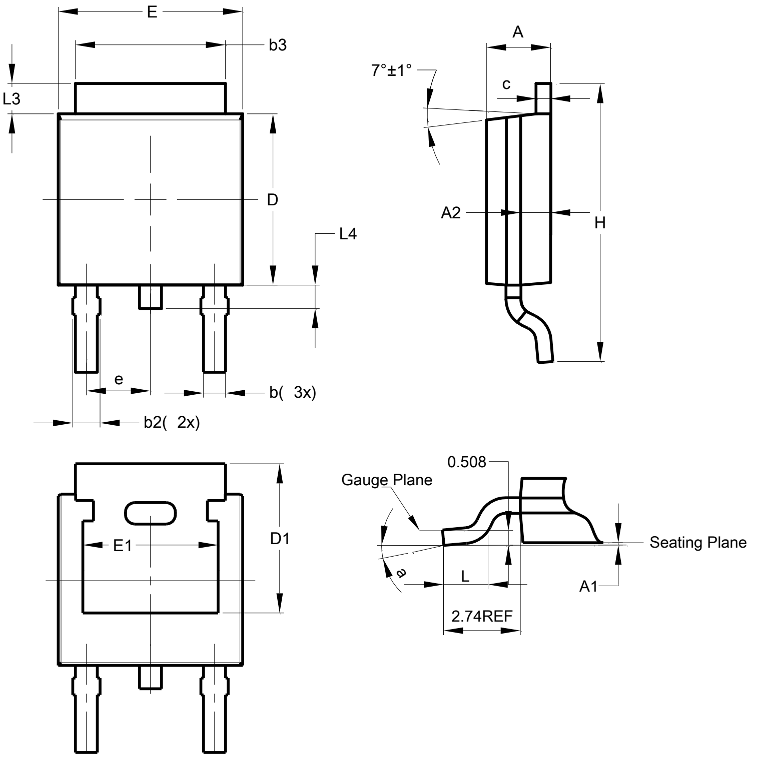


Switching time test circuit

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

TO252 (DPAK)

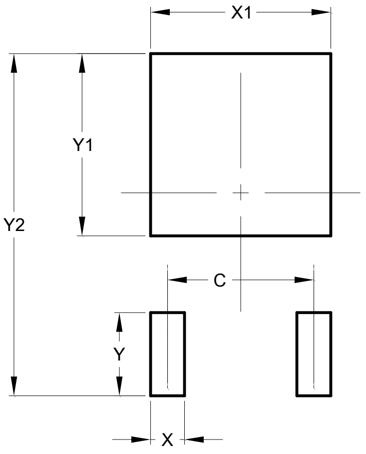


TO252 (DPAK)			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

TO252 (DPAK)



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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