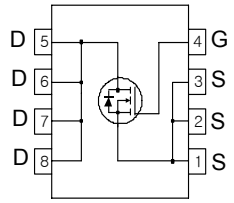
Logic N-Channel MOSFET

Features

- $R_{DS(on)}$ (Max 0.0135Ω)@V_{GS}=10V
  $R_{DS(on)}$ (Max 0.020Ω)@V_{GS}=4.5V
- Gate Charge (Typical 33nC)
- Maximum Junction Temperature Range (150°C)
- Available in Tape and Reel

Symbol



General Description

This Power MOSFET is produced using Semiwell's advanced planar stripe, DMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a low gate charge with superior switching performance, and rugged avalanche characteristics.This Power MOSFET is well suited for power management circuit or DC-DC converter.

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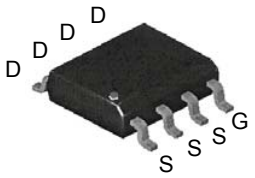

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain to Source Voltage	30	V
I_D	Continuous Drain Current(@T_A = 25°C)	10	A
I_{DM}	Drain Current Pulsed (Note 1)	50	A
V_{GS}	Gate to Source Voltage	±20	V
P_D	Total Power Dissipation Single Operation (T_A=25°C)	2.5	W
	Total Power Dissipation Single Operation (T_A=70°C)	1.6	W
T_{STG}, T_J	Operating Junction Temperature & Storage Temperature	- 55 ~ 150	°C
T_L	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.	300	°C

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 4)	-	-	50	°C/W

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Electrical Characteristics (T_J = 25 °C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	30	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature coefficient	I_D = 250uA, referenced to 25 °C	-	12	-	mV/°C
I_{DSS}	Drain-Source Leakage Current	V_{DS} = 24V, V_{GS} = 0V V_{DS} = 24V, V_{GS} = 0V, T_J = 55 °C	-	-	1 10	uA
I_{GSS}	Gate-Source Leakage, Forward	V_{GS} = 20V, V_{DS} = 0V			100	nA
	Gate-Source Leakage, Reverse	V_{GS} = -20V, V_{DS} = 0V	-	-	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	1.0	-		V
$R_{DS(ON)}$	Static Drain-Source On-state Resistance	V_{GS} = 10 V, I_D = 10A V_{GS} = 4.5 V, I_D = 9A	- -	0.011 0.016	0.0135 0.020	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} =0 V, V_{DS} =15V, f = 1MHz	-	1100	-	pF
C_{oss}	Output Capacitance		-	550	-	
C_{rss}	Reverse Transfer Capacitance		-	150	-	
Dynamic Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 25V, I_D = 1A, R_G = 50Ω V_{GS} = 10 V (Note 2,3)	-	13	25	ns
t_r	Rise Time		-	30	60	
$t_{d(off)}$	Turn-off Delay Time		-	165	260	
t_f	Fall Time		-	65	120	
Q_g	Total Gate Charge	V_{DS} = 15V, V_{GS} = 10V, I_D = 10A (Note 2,3)	-	33	43	nC
Q_{gs}	Gate-Source Charge		-	5.2	-	
Q_{gd}	Gate-Drain Charge(Miller Charge)		-	8	-	

Source-Drain Diode Ratings and Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit.
I_S	Continuous Source Diode Forward Current		-	-	2.1	A
V_{SD}	Diode Forward Voltage	I_S = 2.1A, V_{GS} =0V (Note 2)	-	-	1.2	V

※ NOTES
1. Repeativity rating : pulse width limited by junction temperature
2. Pulse Test : Pulse Width ≤ 300us, Duty Cycle ≤ 2%
3. Essentially independent of operating temperature.
4. Surface mounted on 1 $inch^2$ Cu board.

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Fig 1. On-State Characteristics

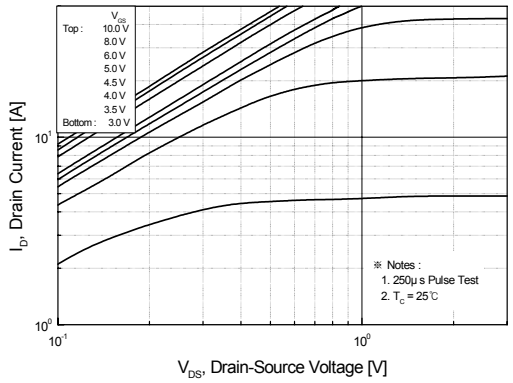

Fig 2. Transfer Characteristics

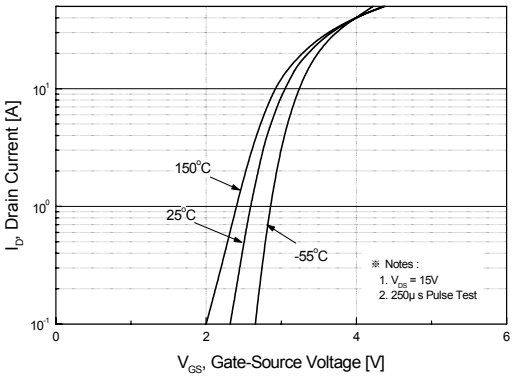

Fig 3. On Resistance Variation vs. Drain Current and Gate Voltage

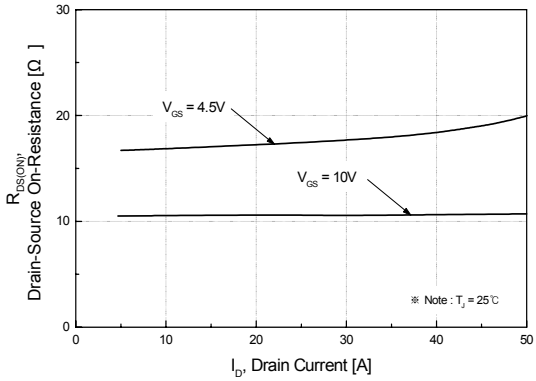

Fig 4. On State Current vs. Allowable Case Temperature

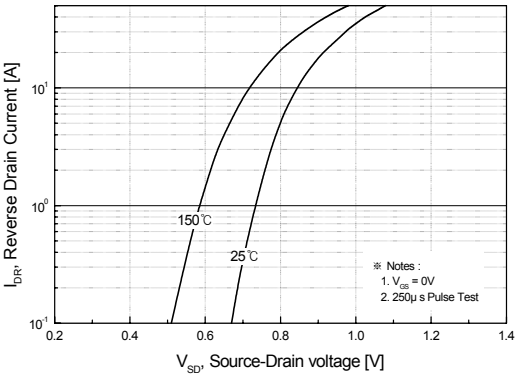

Fig 5. Capacitance Characteristics

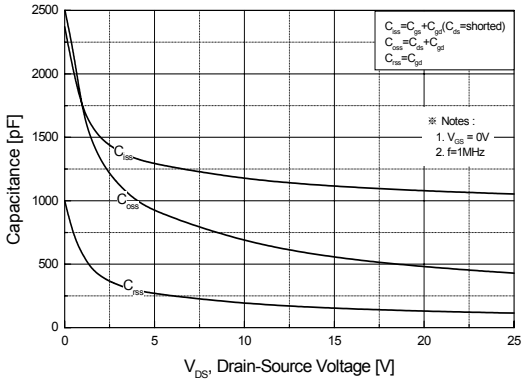

Fig 6. Gate Charge Characteristics

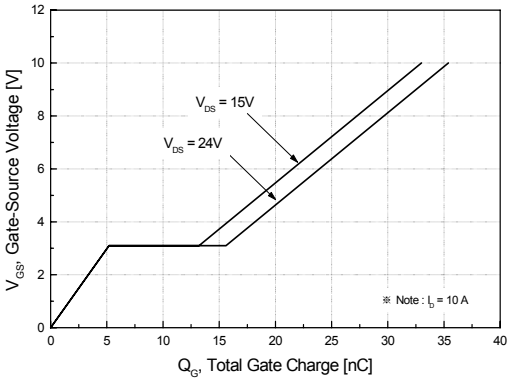

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Fig 7. Breakdown Voltage Variation vs. Junction Temperature

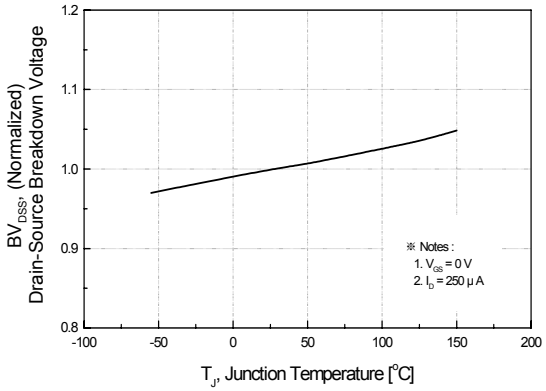

Fig 8. On-Resistance Variation vs. Junction Temperature

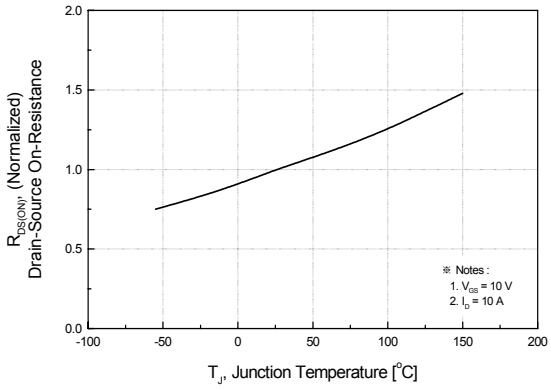

Fig 9. Normalized Transient Thermal Response Curve

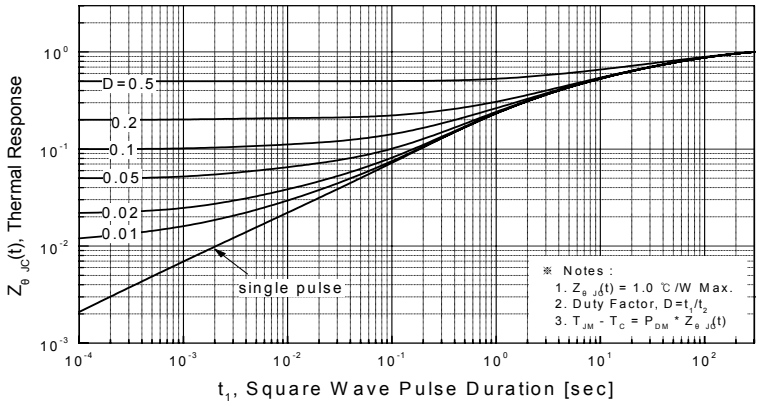

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Fig. 10. Gate Charge Test Circuit & Waveforms

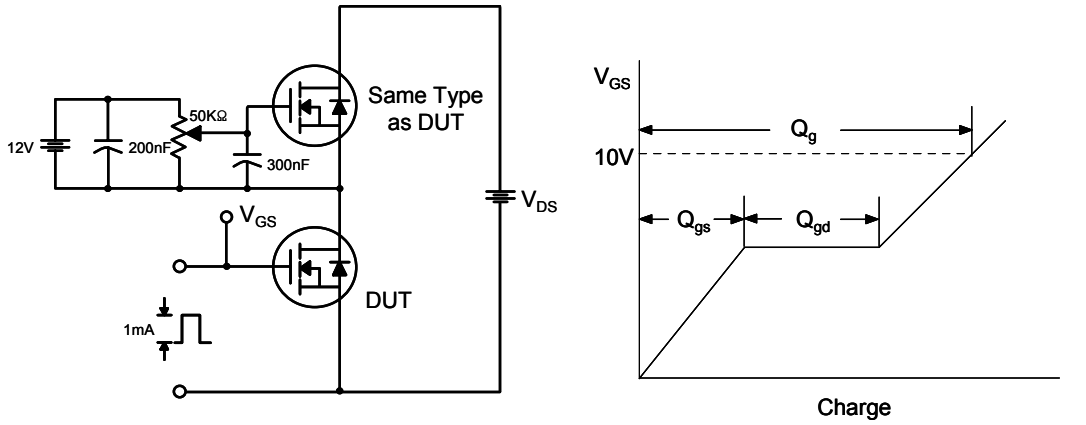
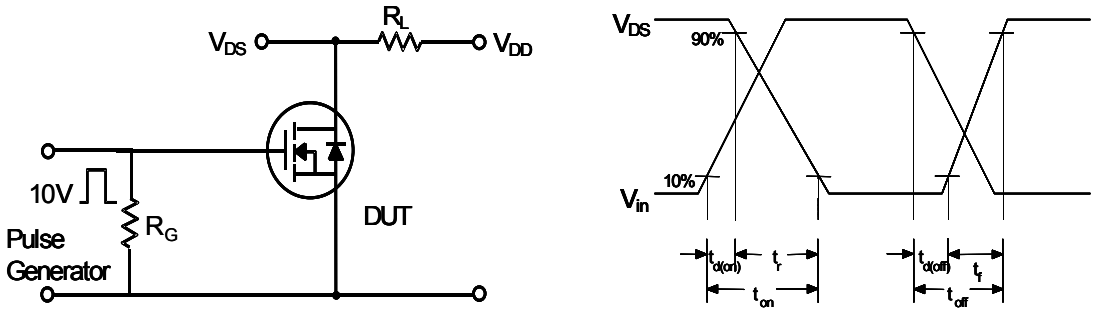


Fig 11. Switching Time Test Circuit & Waveforms



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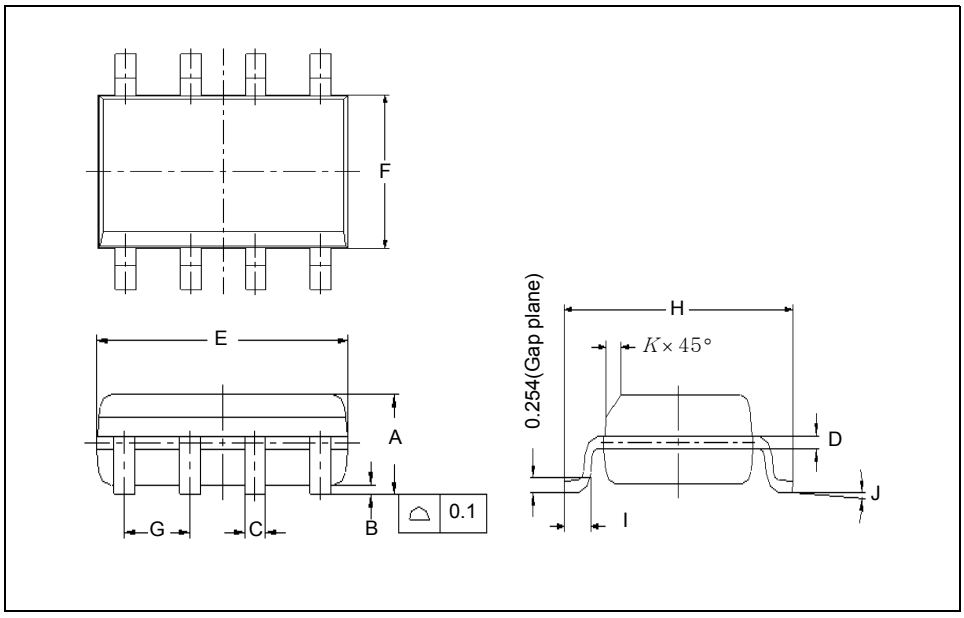
8-SOIC Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.35	1.55	1.75	0.053	0.061	0.069
B	0.1	0.175	0.25	0.004	0.007	0.010
C	0.38	0.445	0.510	0.015	0.018	0.020
D	0.19	0.22	0.25	0.007	0.009	0.010
E	4.8	4.9	5	0.189	0.193	0.197
F	3.8	3.9	4	0.150	0.154	0.157
G	1.27 BSC					
H	5.8	6	6.2	0.228	0.236	0.244
I	0.5	0.715	0.93	0.020	0.028	0.037
J	0’	4’	8’	0’	4’	8’
K	0.250	0.375	0.05	0.010	0.015	0.020



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