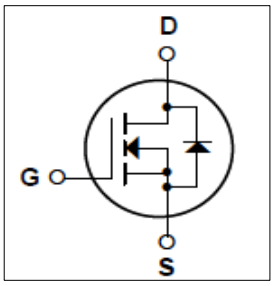
Silicon N-Channel MOSFET



Features

- 6A,700V, R_{DS}(on)(Max 1.5Ω)@VGS=10V
- Ultra-low Gate Charge(Typical 51nC)
- High Current Capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(150℃)

General Description

This Power MOSFET is produced using Winsemi's advanced planar stripe, This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. This devices is specially well suited for high efficiency switch mode power supply. electronic Lamp ballasts based on half bridge and UPS.

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain Source Voltage	700	V
I_D	Continuous Drain Current(@Tc=25℃)	6	A
	Continuous Drain Current(@Tc=100℃)	3.8	A
I_{DM}	Drain Current Pulsed t_p=300us	24	A
V_{GS}	Gate to Source Voltage-Continuous	±30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	582	mJ
Is	Source Current (Body Diode)	6	A
P_D	Total Power Dissipation(@Tc=25℃)	120	W
T_J, T_{stg}	Junction and Storage Temperature	-55~150	℃
T_L	Channel Temperature(1/8" from case for 10s)	260	℃

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	0.96	1.04	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	-	62.5		℃/W

Copyright@Winsemi Microelectronics Co., Ltd., All right reserved.

Electrical Characteristics (Tc = 25℃)

Characteristics		Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current		I_{GSS}	V_{GS} = ±16 V, V_{DS} = 0 V	-	-	±100	nA
Gate-source breakdown voltage		$V_{(BR)GSS}$	I_G = 250μA, V_{DS} = 0 V	±30	-	-	V
Drain cut-off current		I_{DSS}	V_{DS}=700V, V_{GS}=0V, Tc = 25℃	-	-	10	μA
Drain-source breakdown voltage		$V_{(BR)DSS}$	I_D = 250 μA, V_{GS} = 0 V	700	-	-	V
Break Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	I_D=250μA,Referenced to25℃	-	0.79	-	mV/℃
Gate threshold voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D =250 μA	2	-	4	V
Drain-source ON resistance		$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 12A	-	-	1.5	Ω
Forward Transconductance		gfs	V_{DS} = 50V, I_D = 3A	-	4.12	-	S
Input capacitance		C_{iss}	V_{DS} = 25 V,	-	920	1200	pF
Reverse transfer capacitance		C_{rss}	V_{GS} = 0 V,	-	45	55	
Output capacitance		C_{oss}	f = 1 MHz	-	100	115	
Switching time	Rise time	tr	V_{DD} =350	-	23	55	ns
	Turn-on time	ton	I_D =6A	-	18	45	
	Fall time	tf	R_G=11.5Ω	-	26	60	
	Turn-off time	toff		-	76	160	
Total gate charge (gate-source plus gate-drain)		Qg	V_{Ds} =560V	-	51	67	nC
Gate-source charge		Qgs	V_{GS} =10V	-	8.3	-	
Gate-drain (“miller”) Charge		Qgd	I_D =6A	-	23.1	-	

Source-Drain Ratings and Characteristics (Ta = 25℃)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	6	A
Pulse drain reverse current	I_{DRP}	-	-	-	24	A
Forward voltage (diode)	V_{DSF}	I_{DR} = 6A, V_{GS} = 0 V	-	-	1.5	V
Reverse recovery time	t_{rr}	I_{DR} = 6A, V_{GS} = 0 V,	-	440	-	ns
Reverse recovery charge	Q_{rr}	dI_{DR} / dt = 100 A / μs	-	4.05	-	μC

Note 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. L = 30mH, I_{AS} = 6A, V_{DD} = 50V, R_G = 27Ω, Starting T_J = 25°C
4. I_{SD} ≤ 6A, di/dt ≤140A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

TYPICAL PERFORMANCE CURVES

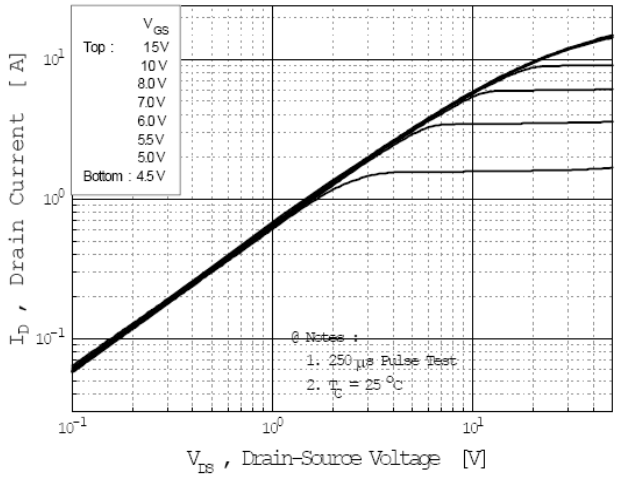


Fig 1.Output Characteristics

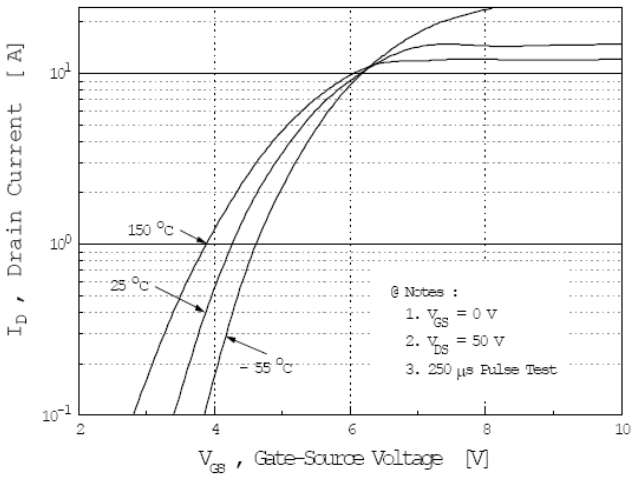


Fig 2.Transfer Characteristics

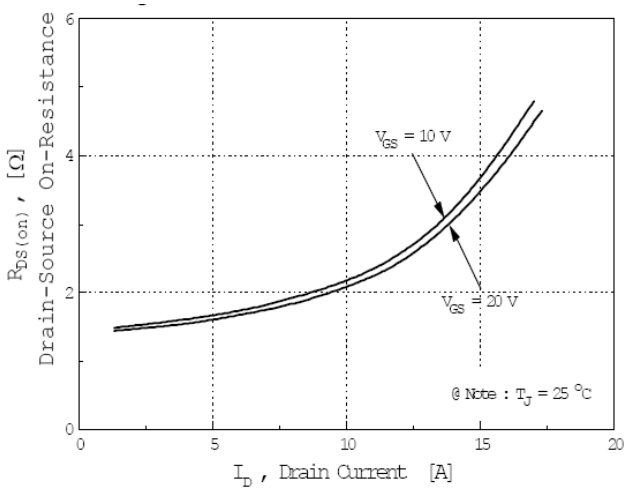


Fig 3.On-Resistance vs. Drain Current

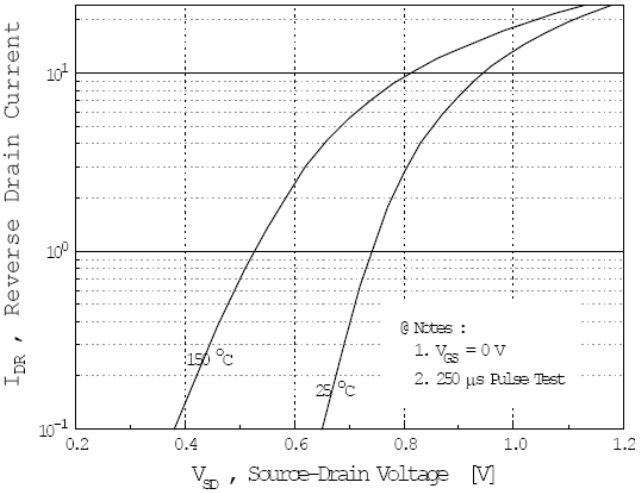


Fig 4.Source- Drain Diode Forward Voltage

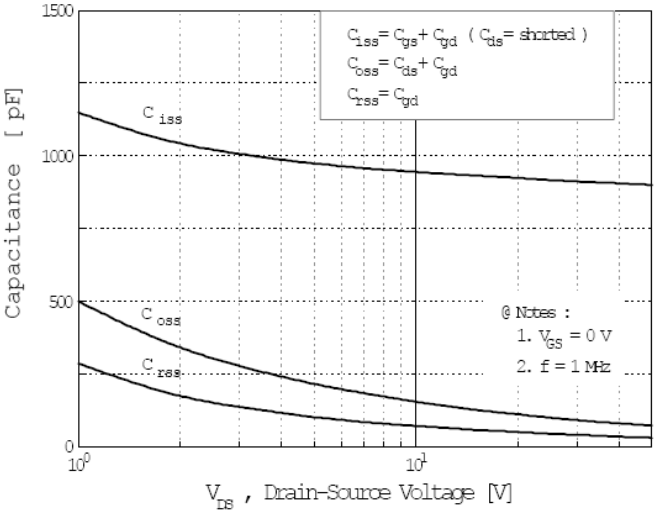


Fig 5.Capacitance vs. Drain-Source Voltage

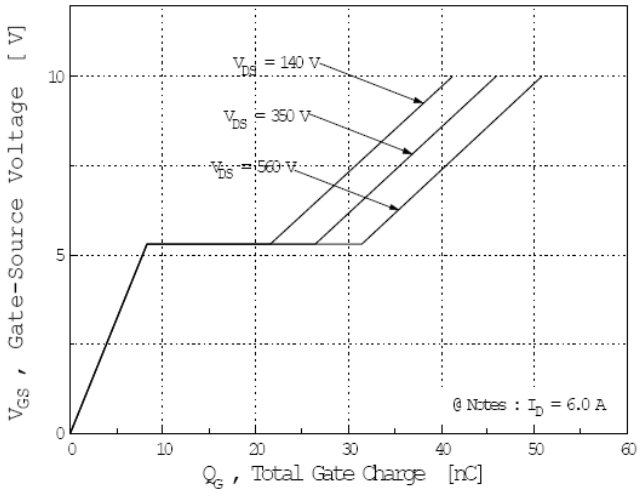


Fig 6.Gate Charge vs.Gate-Source Voltage

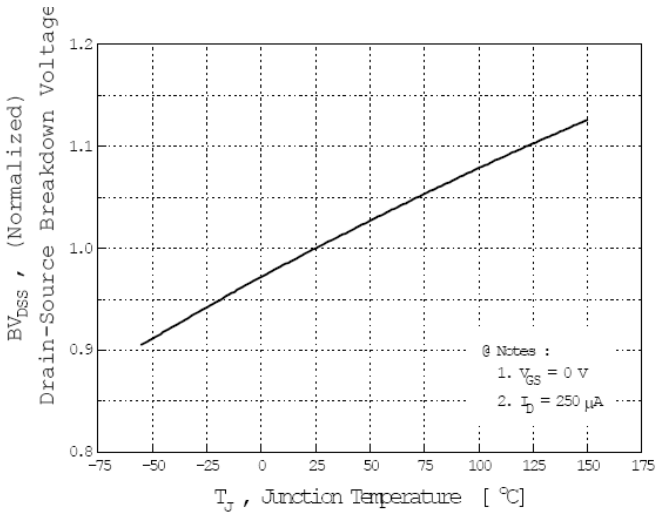


Fig 7.Breakdown Voltage vs.Temperature

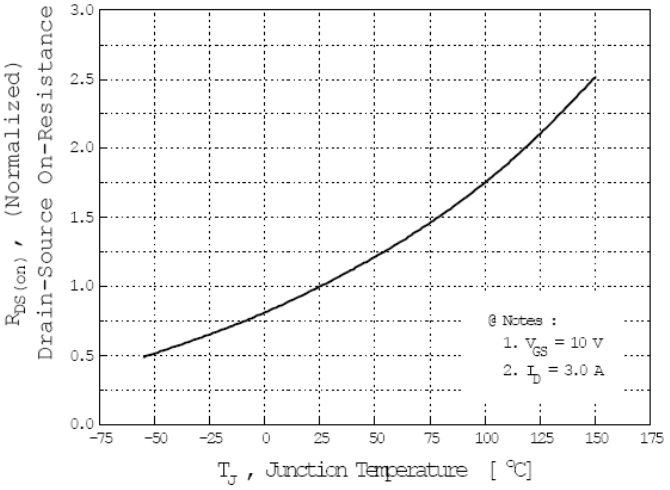


Fig 8. On-Resistance vs.Temperature

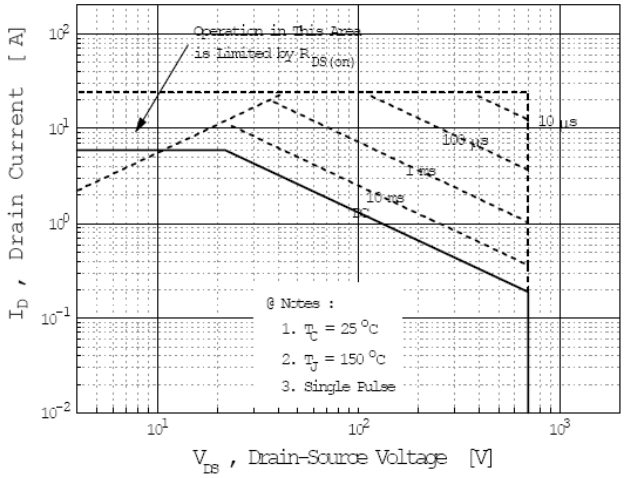


Fig 9. Max. Safe Operating Area

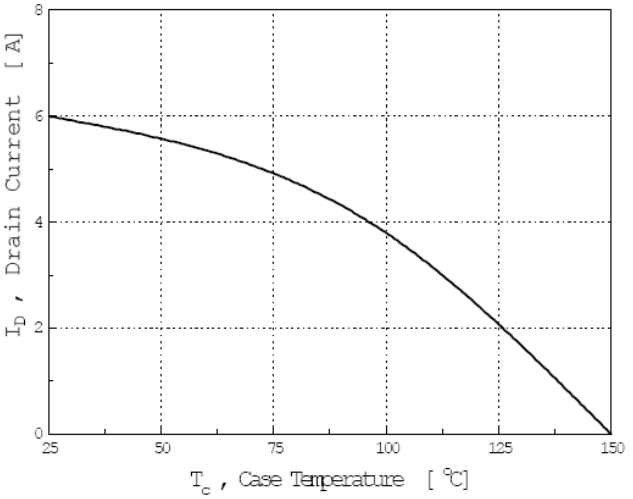


Fig 10.Max. Drain Current vs. Case Temperature

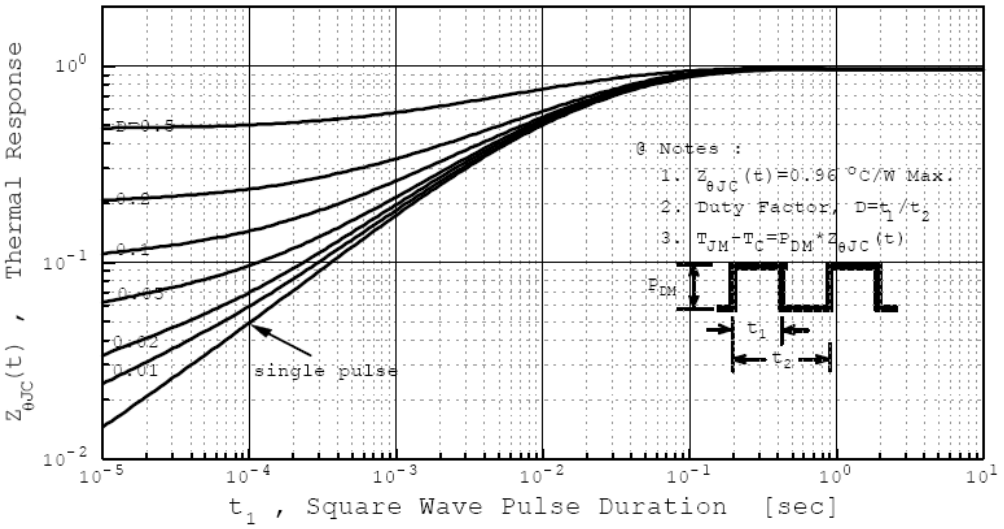
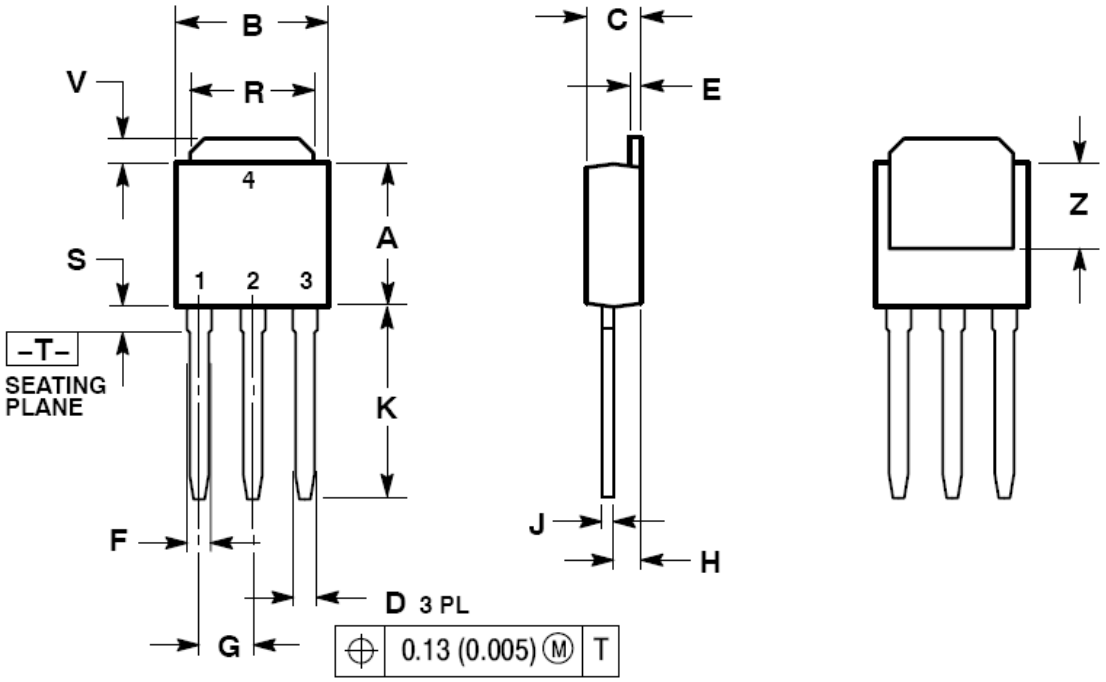


Fig 11.Thermal Response

TO-251 Package Dimension



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.245	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
G	0.090 BSC		2.29 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.350	0.380	8.89	9.65
R	0.180	0.215	4.45	5.45
S	0.025	0.040	0.63	1.01
V	0.035	0.050	0.89	1.27
Z	0.155	---	3.93	---

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN