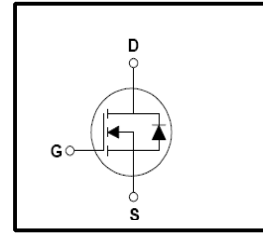


Silicon N-Channel MOSFET
Features

- 28A, 200V, $R_{DS(on)}=0.085\Omega$ @ $V_{GS}=10V$
- Low gate charge (typical 95 nC)
- Low crss (typical 75 pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability


General Description

These N-Channel enhancement mode power field effect transistors are produced using Winsemi's proprietary, planar, DMOS technology.

This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching Performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switching DC/DC converters, Switch mode power supplies, DC-AC converters for uninterrupted power supply and motor control.


Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	200	V
I_D	Drain Current -Continuous($T_C=25^\circ C$)	28	A
	-Continuous($T_C=100^\circ C$)	17.7	A
I_{DM}	Drain Current -Pulsed (Note 1)	112	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy (Note 2)	600	mJ
I_{AR}	Avalanche Current (Note 1)	28	A
E_{AR}	Repetitive Avalanche Energy (Note 1)	15.6	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5.5	V/ns
P_D	Power Dissipation($T_C=25^\circ C$)	156	W
	-Derate above $25^\circ C$	1.25	W/ $^\circ C$
T_J, T_{STG}	Operating and Storage Temperature Range	-55~150	$^\circ C$
T_L	Maximum lead temperature for soldering purposes, 1/8"from case for 5 seconds	300	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance, Junction-to-Case	-	-	0.8	$^\circ C/W$
R_{QCS}	Thermal Resistance, Case-to-Sink	-	0.5	-	$^\circ C/W$
R_{QJA}	Thermal Resistance, Junction-Ambient	-	-	62.5	$^\circ C/W$

Electrical Characteristics $T_C=25^{\circ}\text{C}$

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	200	--	--	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$, Reference d to 25°C	--	0.2	--	$V/^{\circ}\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=200V, V_{GS}=0V$	--	--	10	μA
		$V_{DS}=160V, T_C=125^{\circ}\text{C}$	--	--	100	μA
Gate-Body Leakage Current ,Forward	I_{GSSF}	$V_{GS}=30V, V_{DS}=0V$	--	--	100	nA
Gate-Body Leakage Current ,Reverse	I_{GSSR}	$V_{GS}=-30V, V_{DS}=0V$	--	--	-100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=14A$	--	0.071	0.085	Ω
Forward Transconductance	g_{FS}	$V_{DS}=40V, I_D=14A$ (Note4)	--	25	--	S
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{MHz}$	--	2600	3400	pF
Output Capacitance	C_{oss}		--	330	430	pF
Reverse Transfer Capacitance	C_{rss}		--	75	100	pF
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=100V, I_D=32A, R_G=25\Omega$ (Note4,5)	--	30	70	ns
Turn-On Rise Time	t_r		--	240	490	ns
Turn-Off Delay Time	$T_{d(off)}$		--	295	600	ns
Turn-Off Fall Time	t_f		--	195	400	ns
Total Gate Charge	Q_g		$V_{DS}=160V, I_D=32A, V_G$	--	95	123
Gate-Source Charge	Q_{gs}	$s=10V$	--	13	--	nC
Gate-Drain Charge	Q_{gd}	(Note4,5)	--	43	--	nC

Source-Drain Ratings and Characteristics

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Units
Maximum Continuous Drain-Source Diode Forward Current	I_S	--	--	--	28	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	--	--	--	112	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=28A$	--	--	1.5	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=32A,$	--	220	--	ns
Reverse Recovery Charge	Q_{rr}	$dI_F/dt=100A/\mu s$ (Note4)	--	1.89	--	μC

Notes:

1. Repetitive Rating:Pulse Width limited by maximum junction temperature
2. $L=1.15\text{mH}, I_{AS}=28A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$
3. $I_{SD}\leq 32A, di/dt\leq 300A/\mu s, V_{DD}\leq BV_{DSS}$, Starting $T_J=25^{\circ}\text{C}$
4. Pulse Test:Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
5. Essentially independent of operating temperature

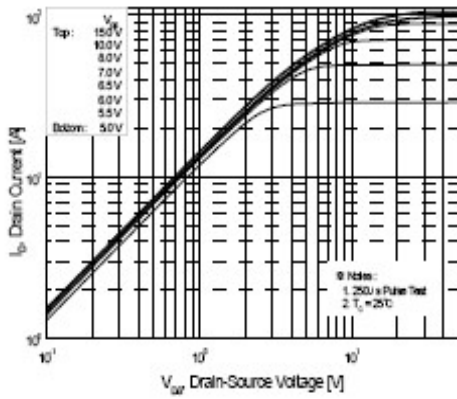


Figure 1. On-Region Characteristics

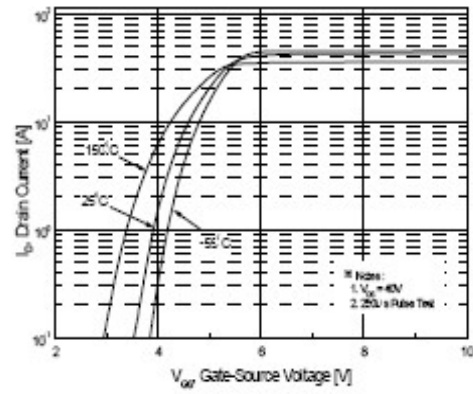


Figure 2. Transfer Characteristics

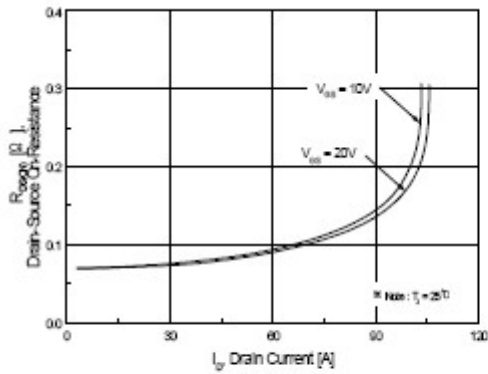


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

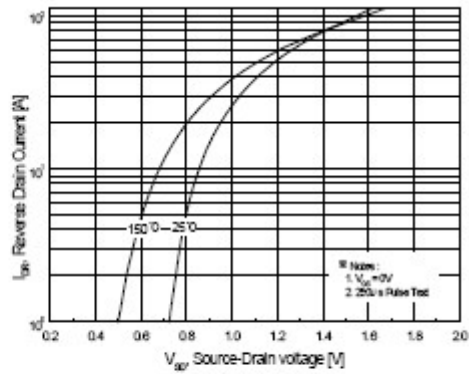


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

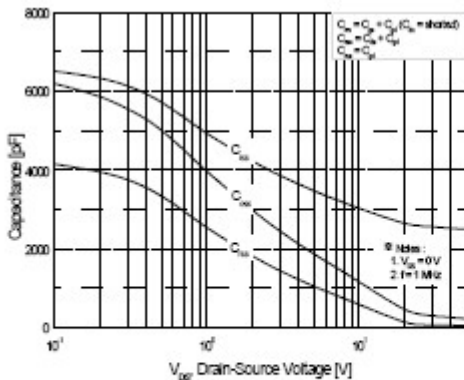


Figure 5. Capacitance Characteristics

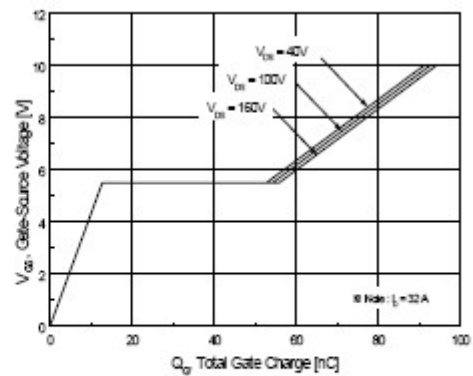


Figure 6. Gate Charge Characteristics

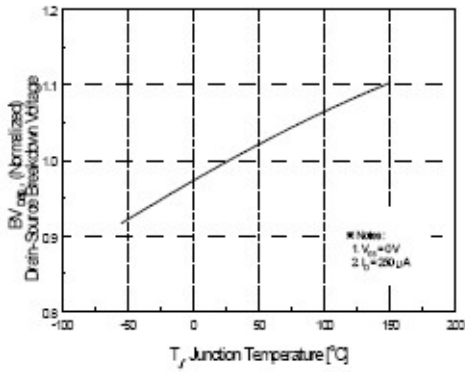


Figure 7. Breakdown Voltage Variation vs Temperature

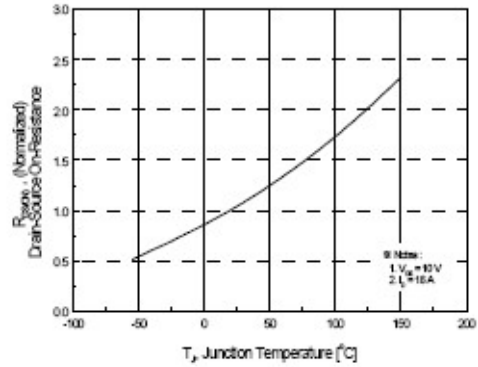


Figure 8. On-Resistance Variation vs Temperature

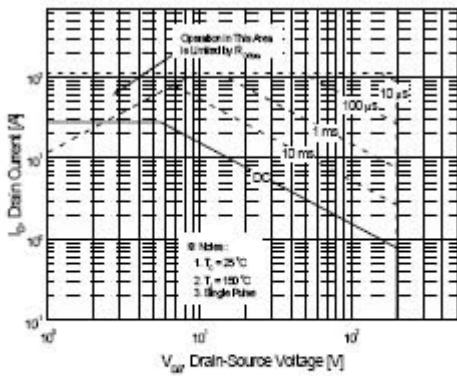


Figure 9 . Maximum Safe Operating Area

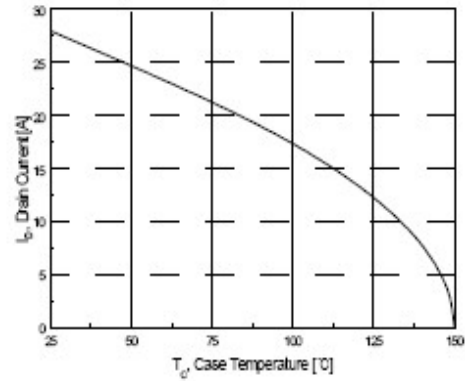


Figure 10. Maximum Drain Current vs Case Temperature

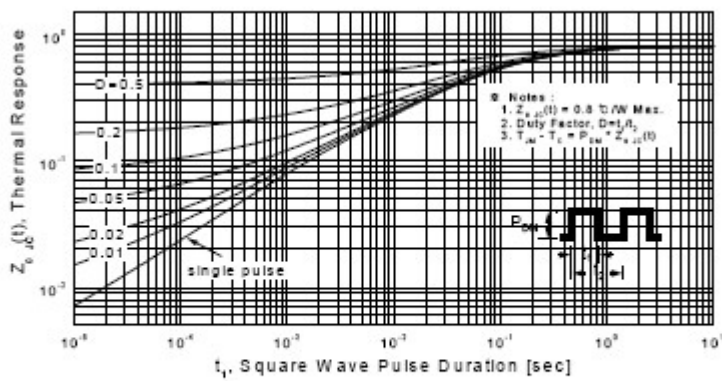
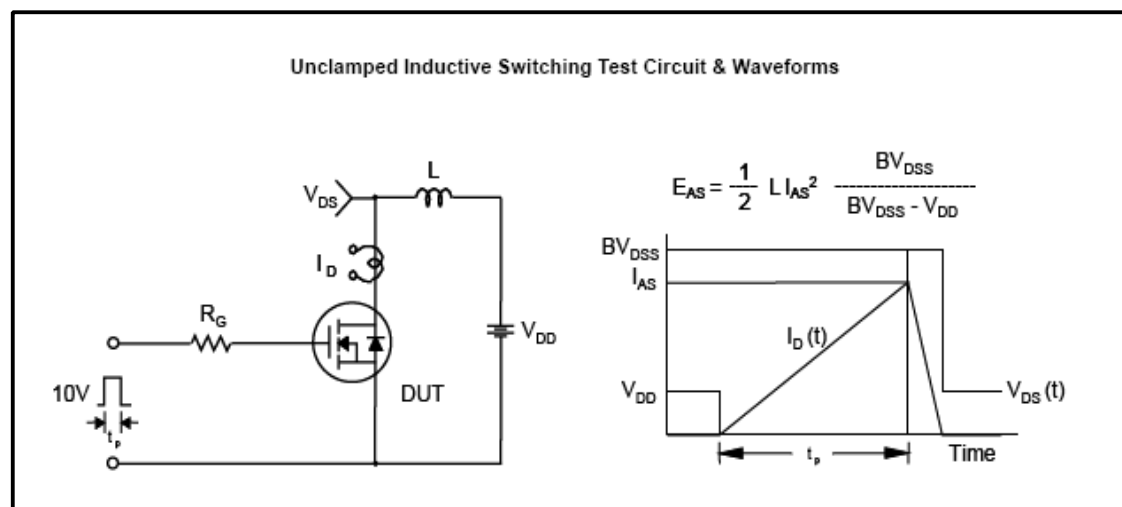
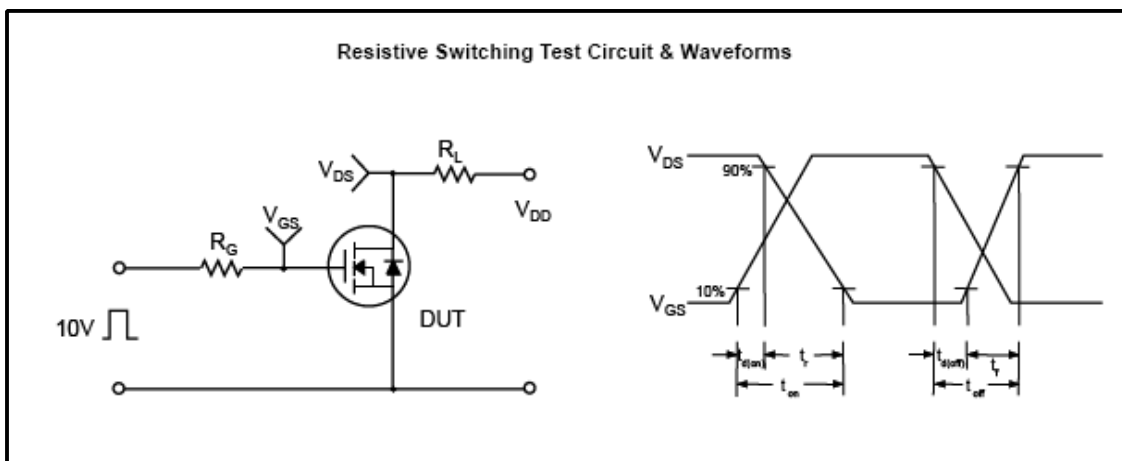
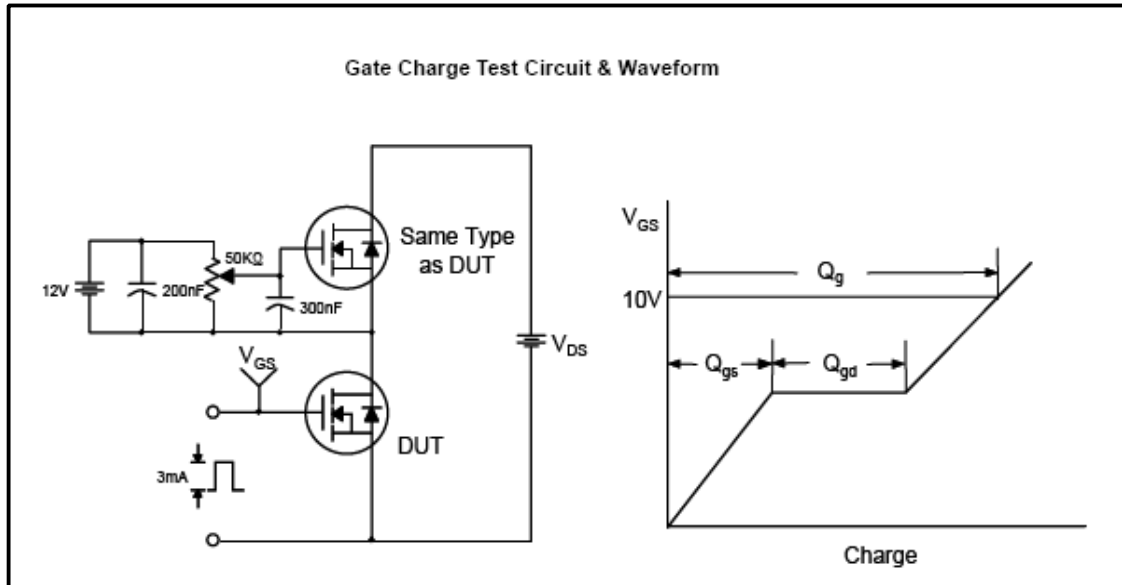


Figure 11. Transient Thermal Response Curve



Peak Diode Recovery dv/dt Test Circuit & Waveforms

