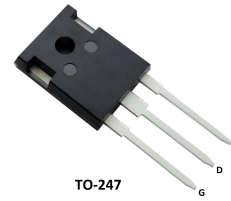


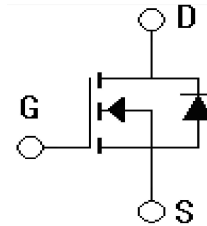
Features

- $V_{DS}=500V, I_D=30A$
- Low C_{rss}
- Low gate charge
- Improved dv/dt capability
- RoHS product



Applications

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- UPS



Absolute Ratings ($T_c=25^\circ\text{C}$)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DSS}	500	V
Transient Gate-Source Voltage	V_{GSM}	± 30	V
Continuous Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current-continuous	I_D	$T_C=25^\circ\text{C}$	A
		$T_C=100^\circ\text{C}$	
Drain Current-pulse ⁽¹⁾	I_{DM}	120	A
Single Pulsed Avalanche Energy ($T_J=25^\circ\text{C}, I_D=I_{AR}, V_{DD}=50V$)	E_{AS}	1760	mJ
Maximum Power Dissipation	PD $T_C=25^\circ\text{C}$ Derate above 25°C	271	W
		2.22	W/ $^\circ\text{C}$
Peak Diode Recovery voltage slope ⁽²⁾	dv/dt	4.5	V/ns
Operating and Storage Temperature Range	T_J, T_{STG}	-45~+150	$^\circ\text{C}$
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^\circ\text{C}$

1. Drain current limited by maximum junction temperature

Electrical Characteristics($T_{CASE}=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	500	-	-	V

Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=V_{DSS}, V_{GS}=0V, T_C=25^{\circ}C$	-	-	10	μA
		$T_C=125^{\circ}C$	-	-	100	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3	4	5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=15A$	-	160	190	m Ω
Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=15A$	-	27.5	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	-	3100	4160	pF
Output capacitance	C_{oss}		-	465	620	pF
Reverse transfer capacitance	C_{rss}		-	34	55	pF

Electrical Characteristics($T_{CASE}=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching-Characteristics						
Turn-On delay time	t _{d(on)}	V _{DS} =250V,I _D =30A, V _{GS} =10V,R _G =25Ω	-	48	105	ns
Turn-On rise time	t _r		-	107	225	ns
Turn-Off delay time	t _{d(Off)}		-	165	340	ns
Turn-Off rise time	t _f		-	85	180	ns
Total Gate Charge	Q _g	V _{DS} =400V,I _D =30A, V _{GS} =10V,R _G =25Ω	-	81	100	nC
Gate-Source charge	Q _{gs}		-	20	-	nC
Gate-Drain charge	Q _{gd}		-	30	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain-Source Diode Forward Curret	V _{SD}	V _{GS} =0V,I _S =30A	-	-	1.4	V
Diode Forward Current	I _S		-	-	30	A
Reverse recovery time	T _{rr}	I _S =30A,dl/dt=100A/μS,	-	530	-	nS
Reverse recovery charge	Q _{rr}	V _G S=0V	-	8.2	-	μC

Thermal Characteristic

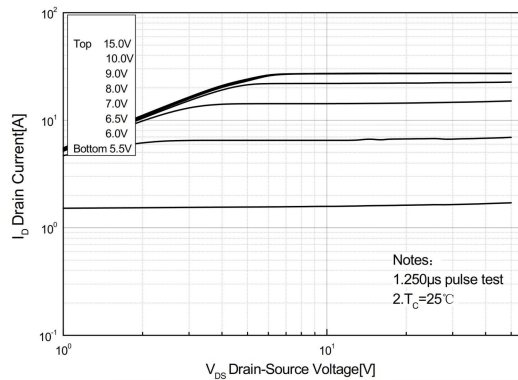
Parameter	Symbol	Value	Unit
Thermal Resistance,junction to Case	$R_{th(j-C)}$	0.45	$^{\circ}\text{C}/\text{W}$
Thermal Resistance,junction to Ambient	$R_{th(j-A)}$	40	$^{\circ}\text{C}/\text{W}$

Notes:

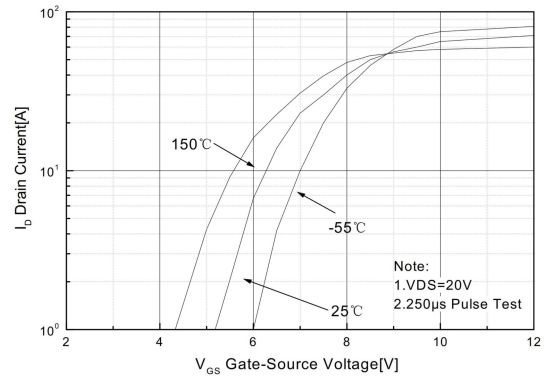
- 1: Pulse width limited by maximum junction temperature
- 2: $L=5.5\text{mH}$, $I_{AS}=30\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J=25^{\circ}\text{C}$
- 3: $ISD \leq 30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BVDSS$, Starting $T_J=25^{\circ}\text{C}$
- 4: Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature

Electrical Characteristics

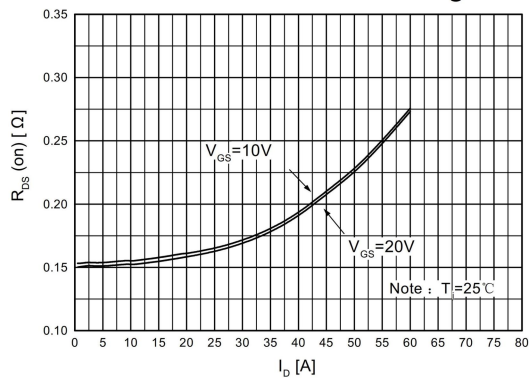
On-Region Characteristics



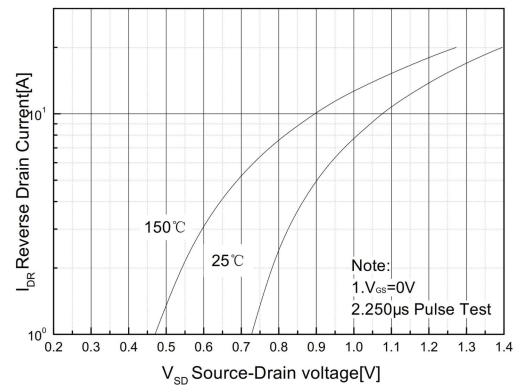
Transfer Characteristics



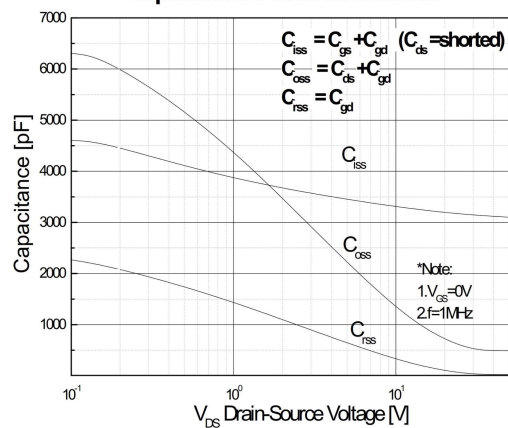
On-Resistance Variation vs Drain Current and Gate Voltage



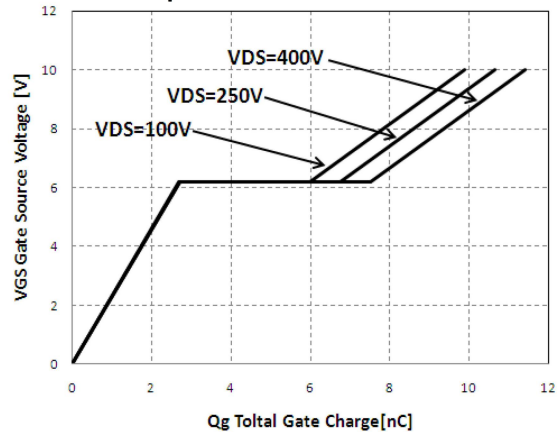
Body Diode Forward Voltage Variation vs. Source Current and Temperature



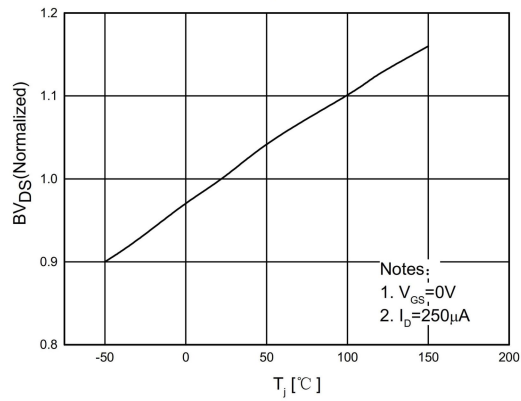
Capacitance Characteristics



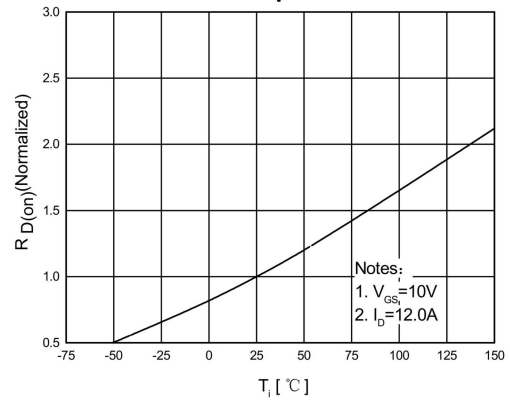
Capacitance Characteristics



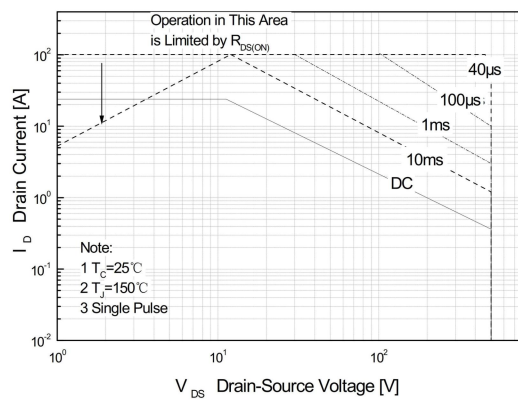
**Breakdown Voltage Variation
vs. Temperature**



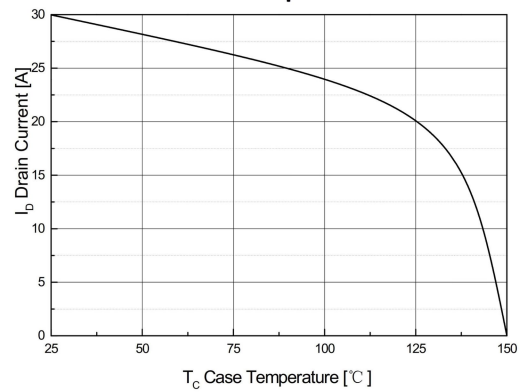
**On-Resistance Variation
vs. Temperature**



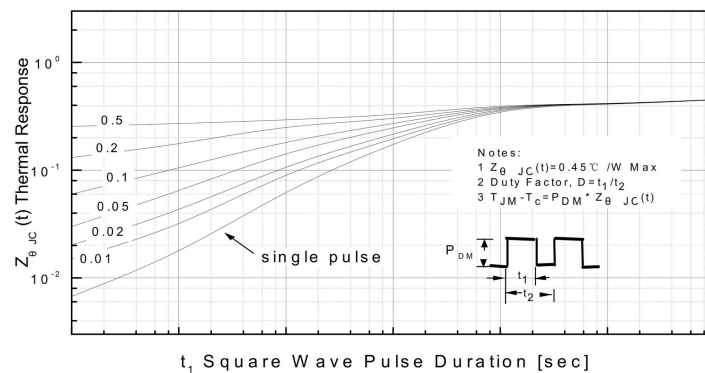
Maximum Safe Operating Area



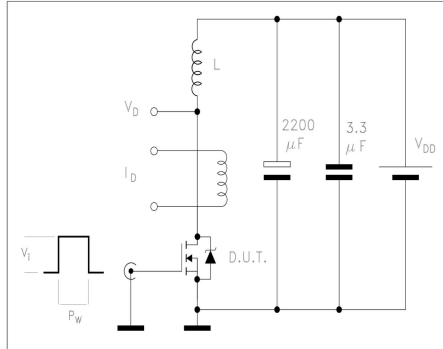
**Maximum Drain Current vs.
Case Temperature**



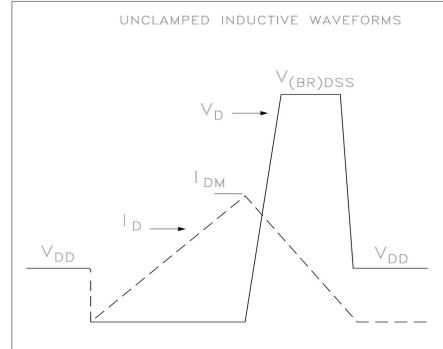
Transient Thermal Response Curve



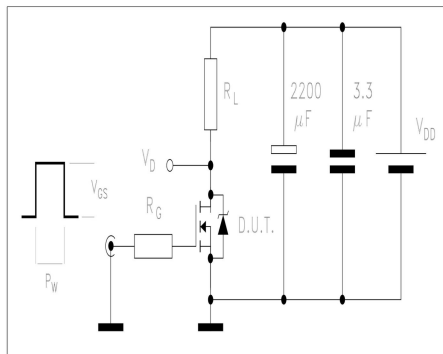
Unclamped Inductive Load Test Circuit



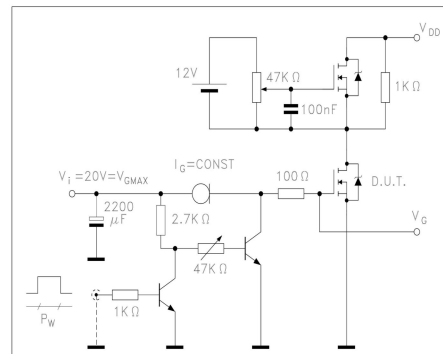
Unclamped Inductive Waveform



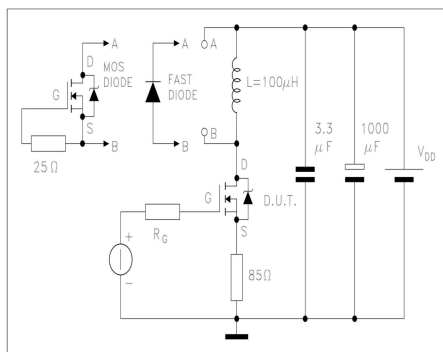
Switching Times Test Circuit For Resistive Load



Gate Charge test Circuit



Test Circuit For Inductive Load Switching And Diode Recovery Times



Package Mechanical Data

