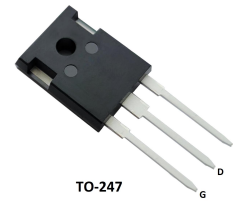


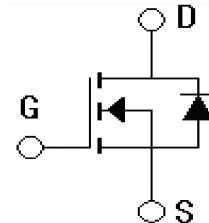
Features

- $V_{DS}=600V, I_D=30A$
- 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 ($T_C=25^{\circ}C$)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DSS}	600	V
Transient Gate-Source Voltage	V_{GSM}	± 30	V
Continuous Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current-continuous	I_D	$T_C=25^{\circ}C$	A
		$T_C=100^{\circ}C$	
Drain Current-pulse(note 1)	I_{DM}	120	A
Single Pulsed Avalanche Energy (note 2)	E_{AS}	2181	mJ
Maximum Power Dissipation	P_D	$T_C=25^{\circ}C$	W
		$T_C=100^{\circ}C$	W
Peak Diode Recovery voltage slope(note 3)	dv/dt	4.5	V/ns
Operating and Storage Temperature Range	T_J, T_{STG}	-45~+150	$^{\circ}C$
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^{\circ}C$

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

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	600	-	-	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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$ (note4)	-	130	180	mΩ
Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=5A$	-	15	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$ (note 4,5)	-	9650	-	pF
Output capacitance	C_{oss}		-	565	-	pF
Reverse transfer capacitance	C_{rss}		-	104	-	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} =300V, I _D =15A, V _{GS} =10V, R _G =2Ω	-	48	-	ns
Turn-On rise time	t _r		-	67	-	ns
Turn-Off delay time	t _{d(Off)}		-	115	-	ns
Turn-Off rise time	t _f		-	35	-	ns
Total Gate Charge	Q _g	V _{DS} =480V, I _D =30A, V _{GS} =10V, R _G =2Ω (note 4,5)	-	311	-	nC
Gate-Source charge	Q _{gs}		-	50	-	nC
Gate-Drain charge	Q _{gd}		-	196	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1A(note 4)	-	-	1.2	V
Diode Forward Current	I _S		-	-	30	A
Reverse recovery time	T _{rr}	I _S =30A, dI/dt=100A/μs,	-	530	-	ns
Reverse recovery charge	Q _{rr}	V _R =100V, V _{GS} =0V	-	8.2	-	μC

Thermal Characteristic

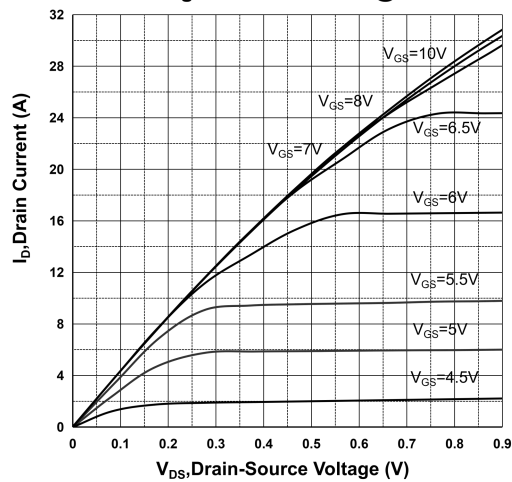
Parameter	Symbol	Value	Unit
Thermal Resistance, junction to Case	$R_{th(j-C)}$	0.32	$^{\circ}C/W$
Thermal Resistance, junction to Ambient	$R_{th(j-A)}$	40	$^{\circ}C/W$

Notes:

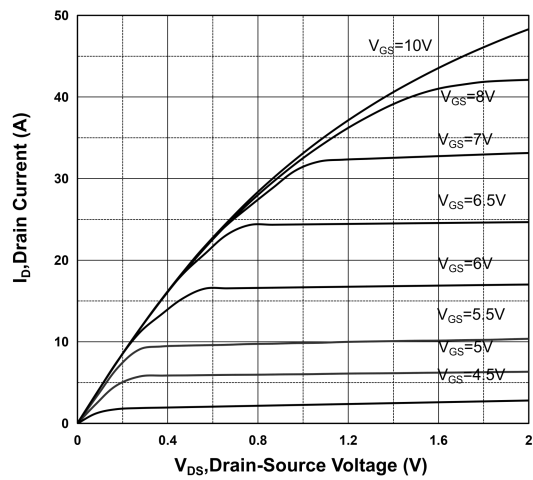
- 1: Pulse width limited by maximum junction temperature
- 2: $L=10mH, I_{AS}=20A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 30A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature

Electrical Characteristics

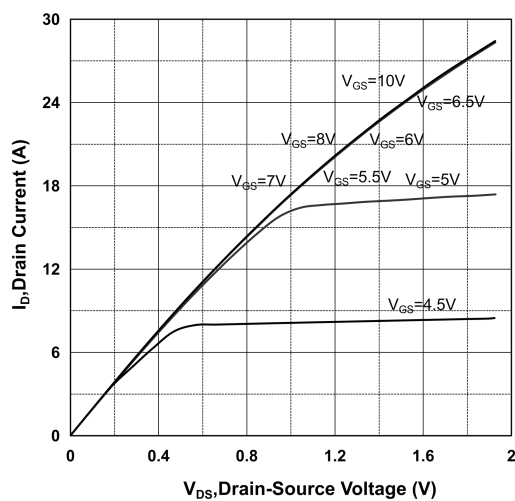
On-Region Characteristic@25°C



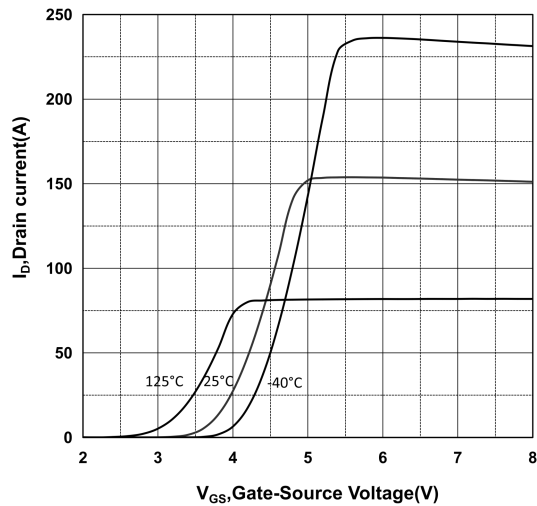
Extended On-Region Characteristic@25°C



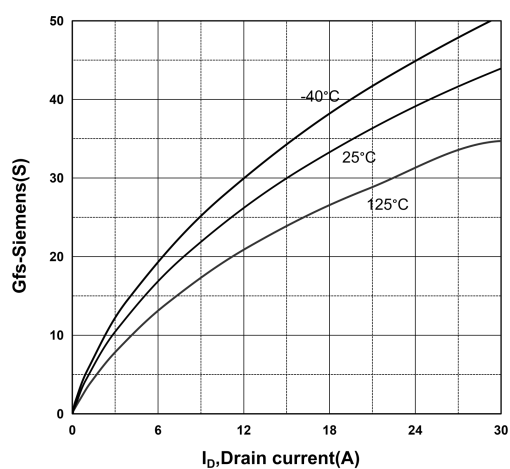
On-Region Characteristic@125°C



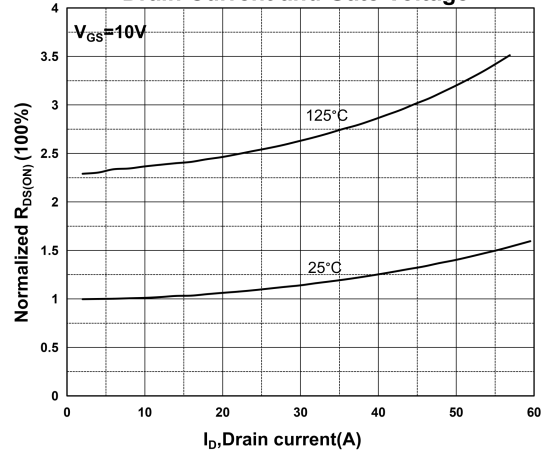
Transfer Characteristics

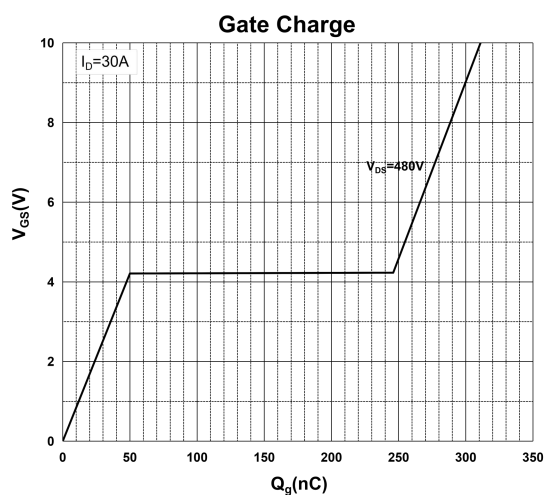
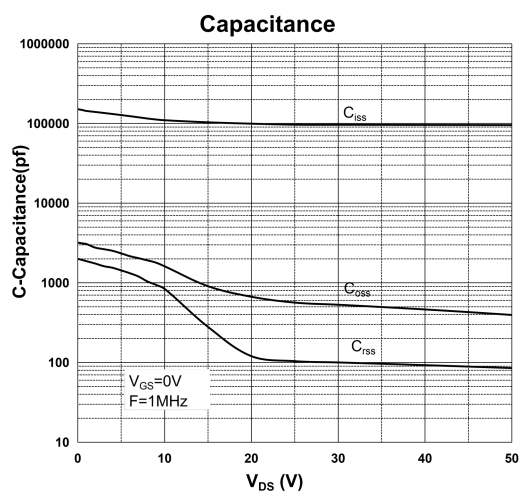
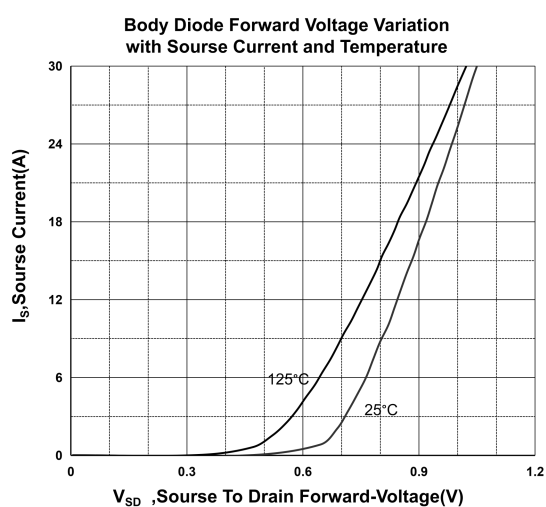
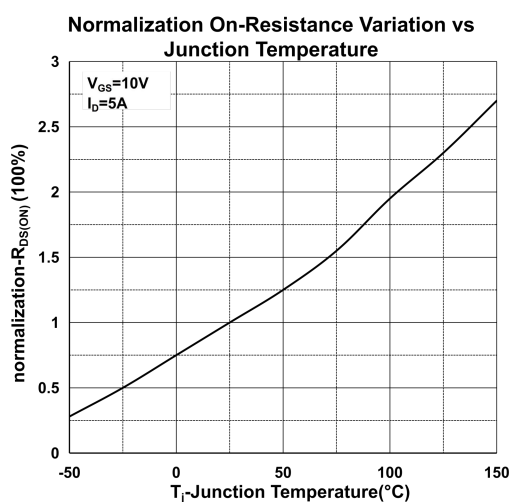
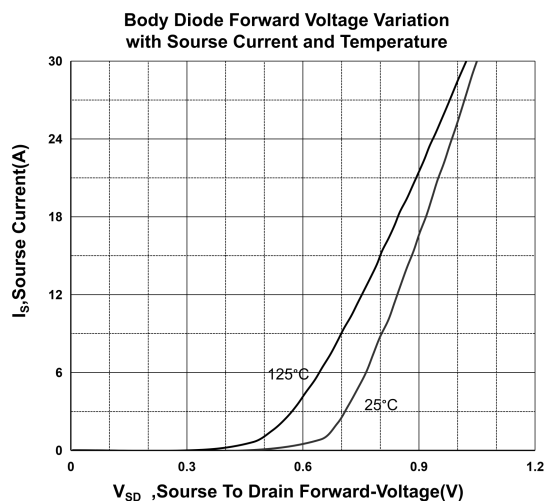
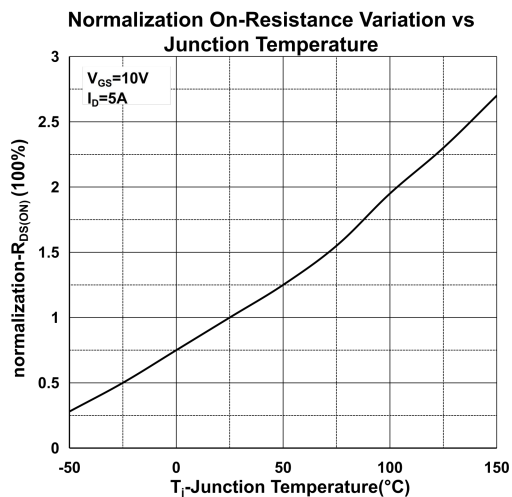


Transconductance

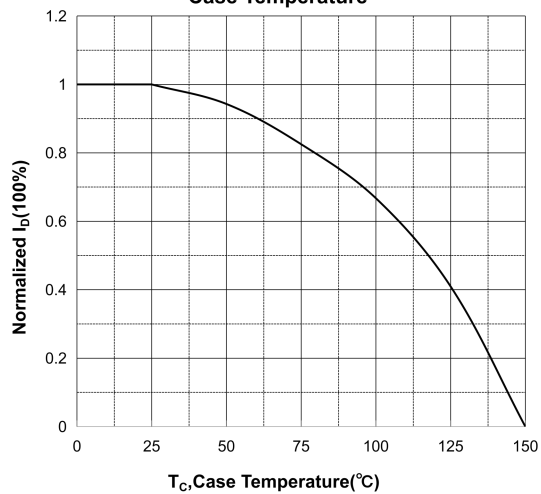


Normalized On-Resistance Variation vs Drain Current and Gate Voltage

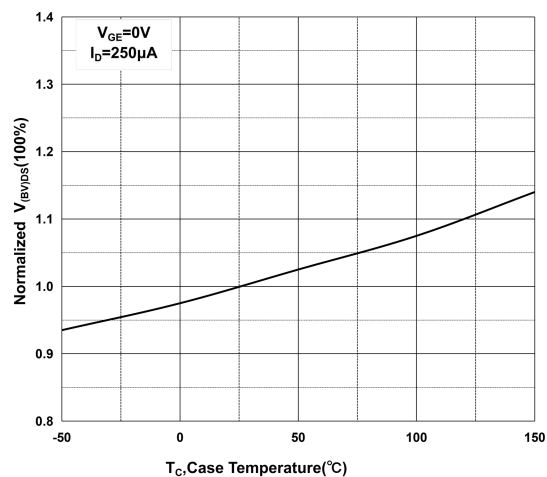




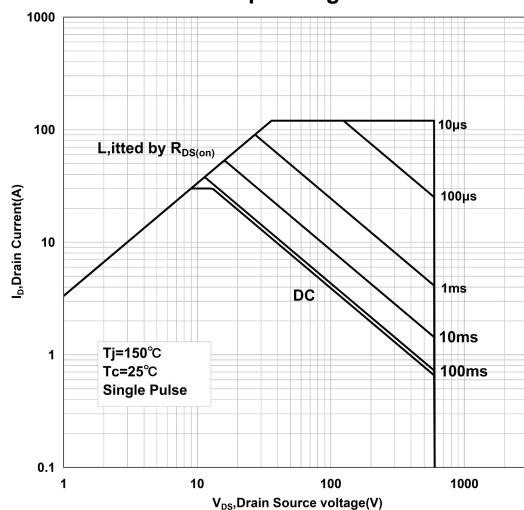
Normalized Maximum Drain Current vs Case Temperature



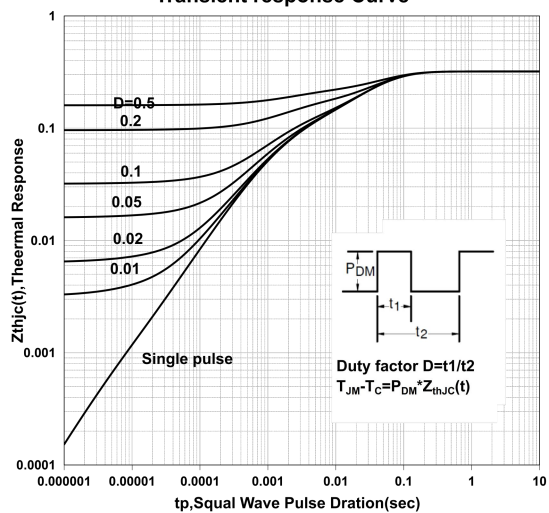
Normalized $V_{(BV)DS}$ vs temperature



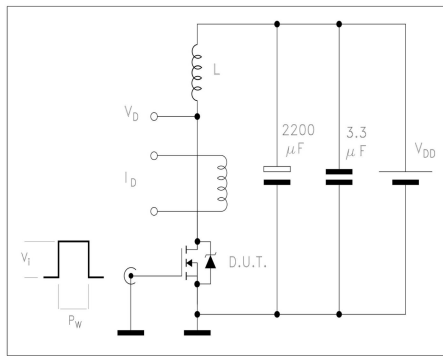
Safe Operating Area



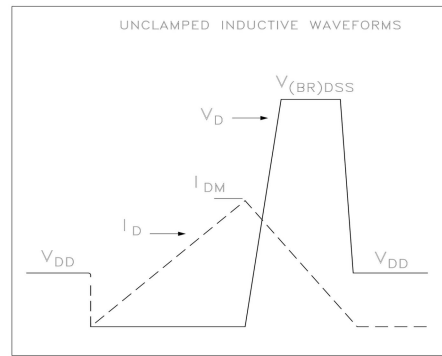
Transient response Curve



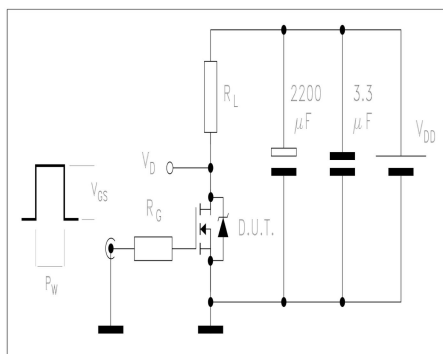
Unclamped Inductive Load Test Circuit



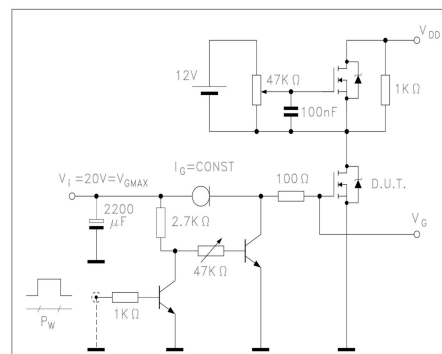
Unclamped Inductive Waveform



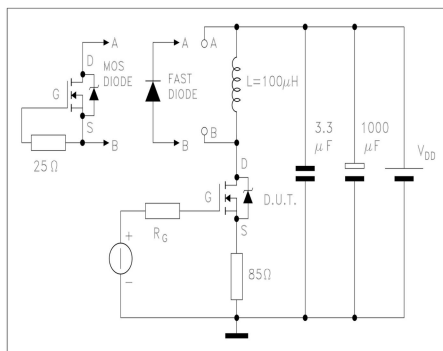
Switching Times Test Circuit For Resistive Load



Gate Charge test Circuit



Test Circuit For Inductive Load Switching And Diode Recovery Times



Package Mechanical Data

