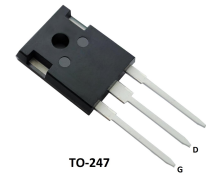


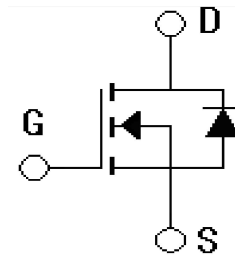
## Features

- Advanced Process Technology
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated
- Ease of Paralleling
- Simple Drive Requirements



## Applications

- High efficiency switch mode Power supplies



## Absolute Ratings (Tc=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	200	V
Drain Current -continuous	I <sub>D</sub> , T=25°C T=100°C	50	A
		35	A
Drain Current - pulse (note 1)	I <sub>DM</sub>	200	A
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Single Pulsed Avalanche Energy (note 2)	E <sub>AS</sub>	560	mJ
Avalanche Current (note 1)	I <sub>AR</sub>	50	A
Repetitive Avalanche Current (note 1)	E <sub>AR</sub>	30	mJ
Peak Diode Recovery dv/dt (note 3)	dv/dt	10	V/ns
Power Dissipation	PD TC=25°C -Derate above 25°C	300	W
		2.0	W/°C
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~+175	°C
Maximum Lead Temperature for Soldering Purposes	T <sub>L</sub>	300	°C

\*Drain current limited by maximum junction temperature

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

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
<b>Off-Characteristics</b>						
Drain-Source Voltage	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	200	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	$I_D=1mA$ , referenced to $25^{\circ}C$	-	0.26	-	V/ $^{\circ}C$
Drain cut-off current	$I_{DSS}$	$V_{DS}=200V, V_{GS}=0V$ $T_j=25^{\circ}C$	-	-	25	$\mu A$
		$V_{DS}=160V, T_j=150^{\circ}C$	-	-	250	
Gate-body leakage current, forward	$I_{GSSF}$	$V_{DS}=0V, V_{GS}=20V$	-	-	100	nA
Gate-body leakage current, reverse	$I_{GSSR}$	$V_{DS}=0V, V_{GS}=-20V$	-	-	-100	nA
<b>On-Characteristics</b>						
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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=28A$ (note 3)	-	-	0.04	$\Omega$
Forward Transconductance	$g_{fs}$	$V_{DS}=50V, I_D=28A$ (note 3)	27	-	-	S
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{iss}$	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHZ$	-	4057	-	pF
Output capacitance	$C_{oss}$		-	603	-	pF
Reverse transfer capacitance	$C_{rss}$		-	161	-	pF

<b>Switching Characteristics</b>						
Turn-On delay time	$t_{d(on)}$	$V_{DD}=100V, I_D=28A,$ $R_G=1.8\Omega,$ $V_{GS}=10V$ (note 4,5)	-	17	-	ns
Turn-On rise time	$t_r$		-	60	-	ns
Turn-Off delay time	$T_{d(off)}$		-	55	-	ns
Turn-Off Fall time	$t_f$		-	48	-	ns
Total Gate Charge	$Q_g$	$V_{DS}=160V,$ $I_D=28A,$ $V_{GS}=10V$ (note4,5)	-	-	234	nC
Gate-Source charge	$Q_{gs}$		-	-	38	nC
Gate-Drain charge	$Q_{gd}$		-	-	110	nC
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=28A$ (note 3)	-	-	1.3	V

Maximum Continuous Drain-Source Diode Forward Current	$I_S$		-	-	50	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$		-	-	200	A
Reverse recovery time	$t_{rr}$	VGS=0V,IF=28A dIF/dt=100A/us(note 3)	-	268	402	ns
Reverse recovery charge	$Q_{rr}$		-	1.9	2.8	uC

### Thermal Characteristic

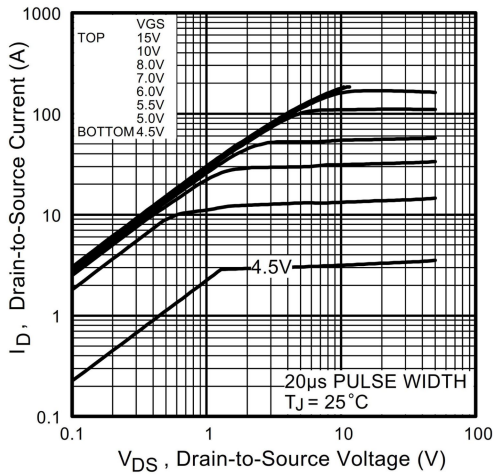
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.5	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	$^{\circ}C/W$

Notes:

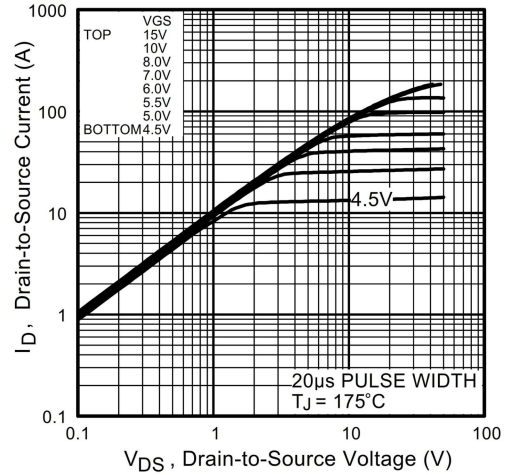
- 1: Repetitive rating; pulse width limited by max. junction temperature
- 2: Starting  $T_J = 25^{\circ}C$ ,  $L = 1.5mH$   $R_G = 25\Omega$ ,  $I_{AS} = 28A$ .
- 3:  $I_{SD} \leq 28A$ ,  $di/dt \leq 486A/\mu s$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq 175^{\circ}C$
- 4: Pulse Test: Pulse Width  $\leq 400\mu s$ , Duty Cycle  $\leq 2\%$
- 5: Essentially independent of operating temperature

## Electrical Characteristics

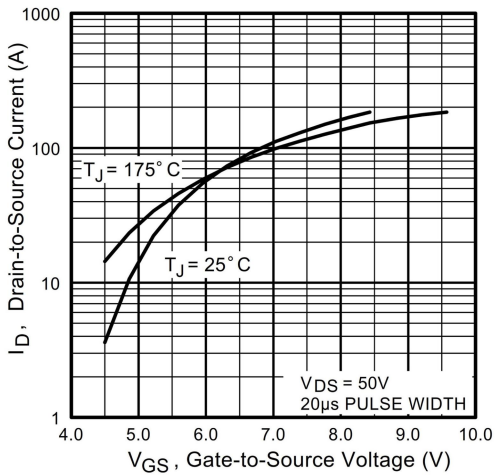
Typical Output Characteristics



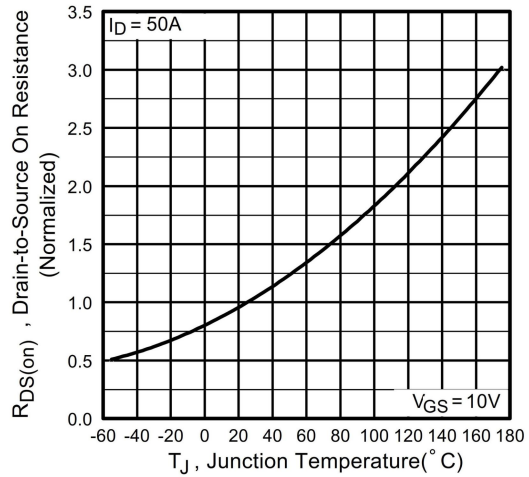
Typical Output Characteristics



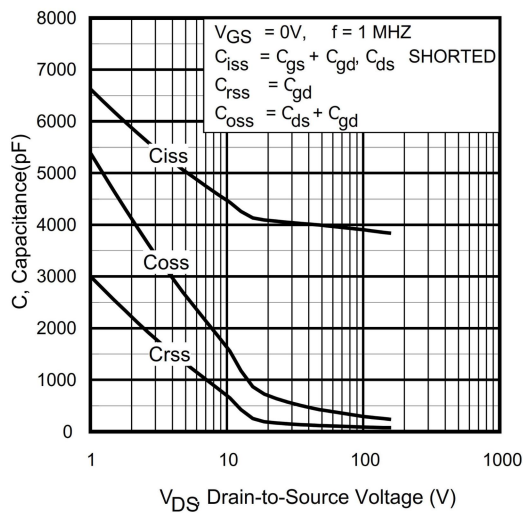
Typical Transfer Characteristics



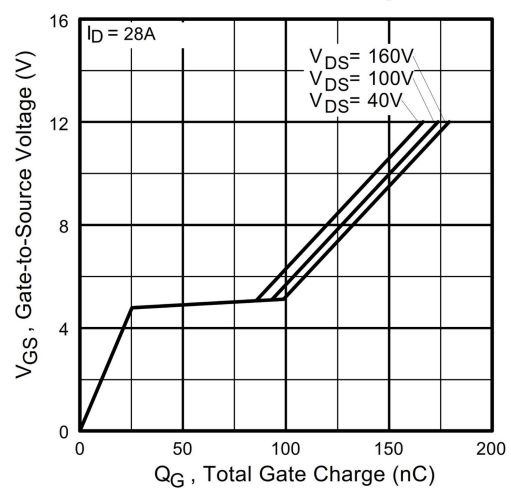
Normalized On-Resistance Vs. Temperature



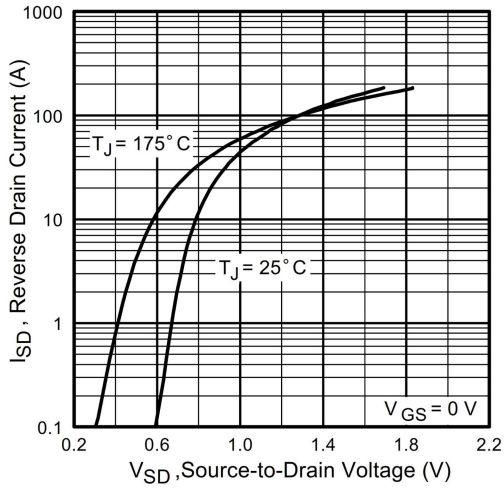
Typical Capacitance Vs. Drain-to-Source Voltage



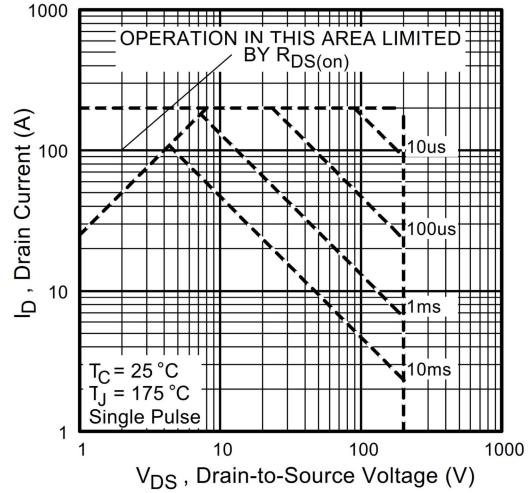
Typical Gate Charge Vs. Gate-to-Source Voltage



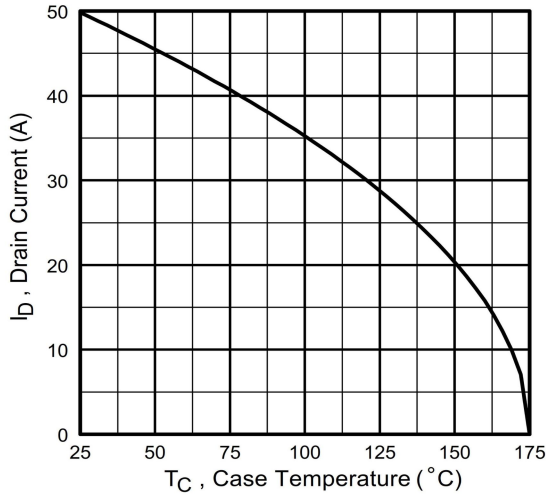
Typical Source-Drain Diode Forward Voltage



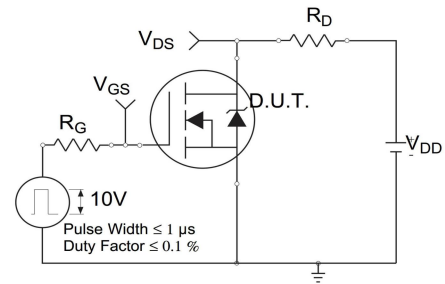
Maximum Safe Operating Area



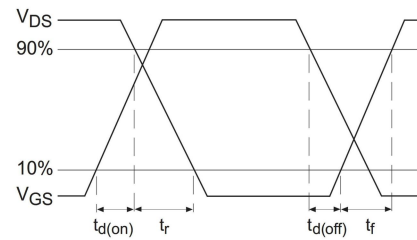
Maximum Drain Current Vs. Case Temperature



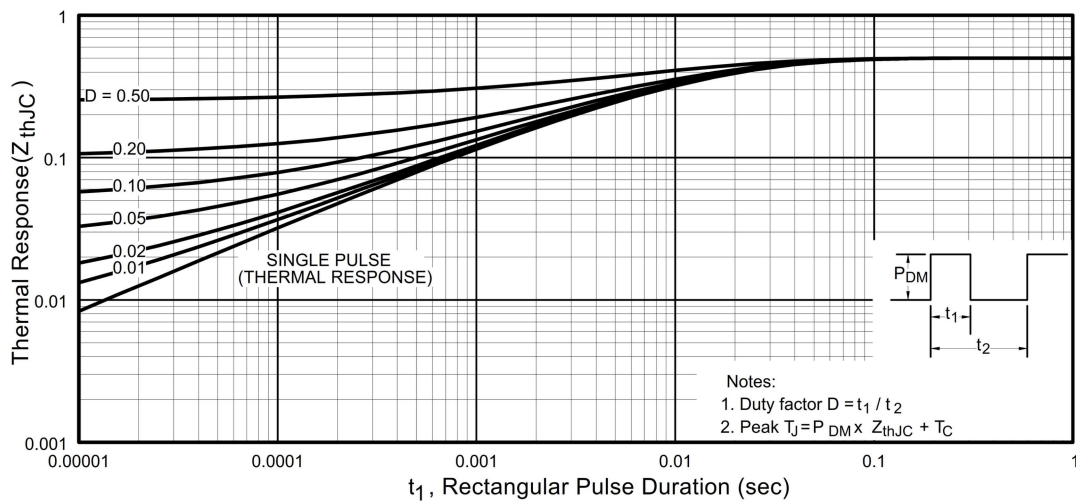
Switching Time Test Circuit



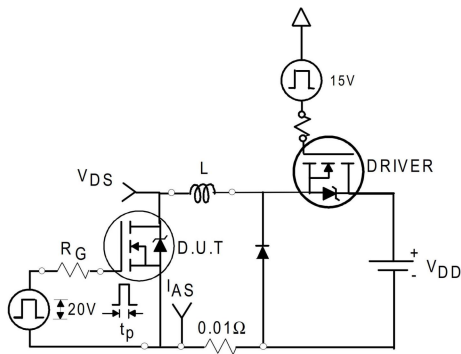
Switching Time Waveforms



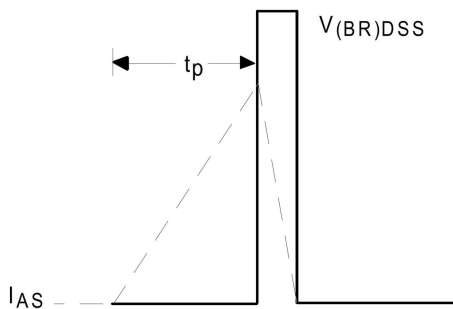
Maximum Effective Transient Thermal Impedance, Junction-to-Case



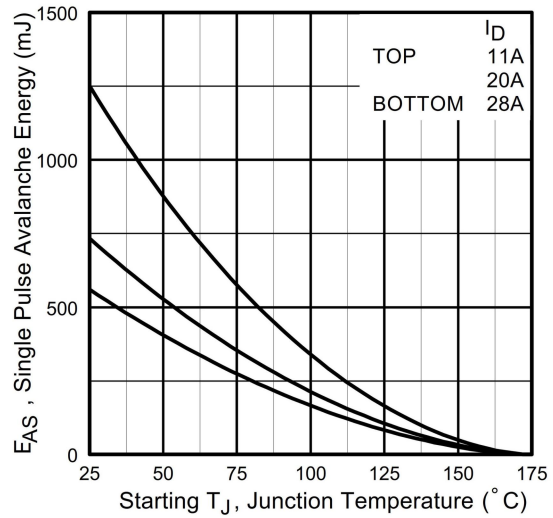
### Unclamped Inductive Test Circuit



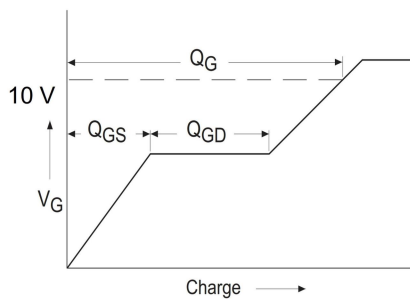
### Unclamped Inductive Waveforms



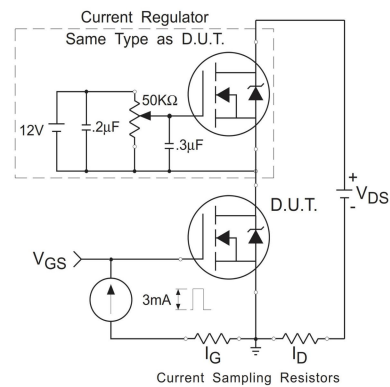
### Maximum Avalanche Energy Vs. Drain Current



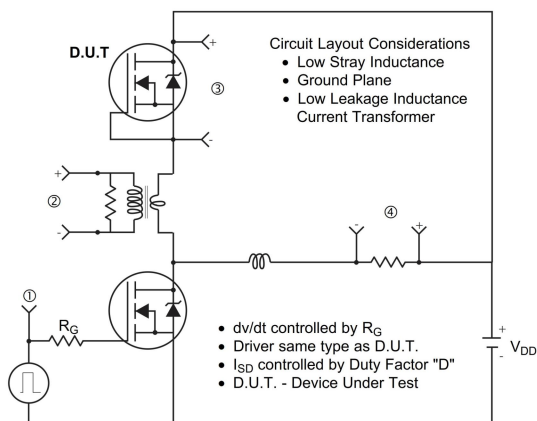
### Basic Gate Charge Waveform



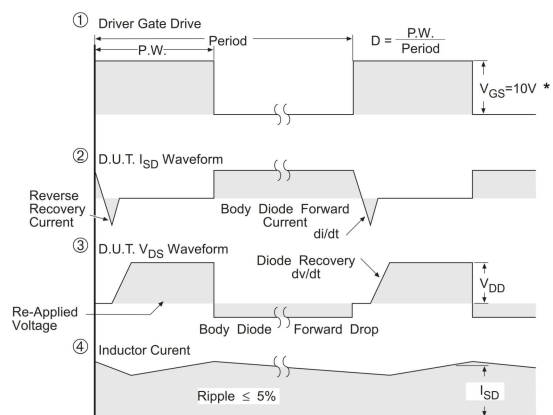
### Gate Charge Test Circuit



### Peak Diode Recovery dv/dt Test Circuit



### For N-Channel HEXFETS



\*  $V_{GS} = 5V$  for Logic Level Devices

## Package Mechanical DATA

