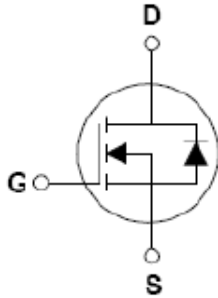
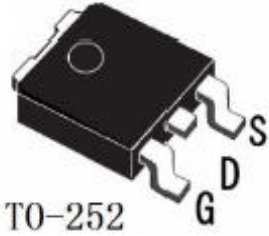


## N-CHANNEL POWER MOSFET

## CDD6N60



### TO-252 (DPAK)

### Plastic Package

- Fast Switching Capability
- Low Gate Charge (Typical 20nC)
- Low Reverse Transfer Capacitance ( $C_{rss}$  = Typical 10 pF)
- $R_{DS(ON)} = 1.5 \Omega$  @  $V_{GS} = 10V$
- Avalanche Energy Specified

### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ C$ unless otherwise specified) <sup>(1)</sup>

PARAMETER	SYMBOL	VALUE	UNIT
Drain - Source Voltage	$V_{DSS}$	600	V
Drain Current	Continuous	$I_D$	A
	Pulsed <sup>(2)</sup>	$I_{DM}$	
Gate - Source Voltage	$V_{GSS}$	$\pm 30$	V
Single Pulsed Avalanche Energy <sup>(3)</sup>	$E_{AS}$	440	mJ
Avalanche Energy, Repetitive <sup>(2)</sup>	$E_{AR}$	13	mJ
Avalanche Current <sup>(2)</sup>	$I_{AR}$	6.2	A
Peak Diode Recovery $dv/dt$ <sup>(4)</sup>	$dv/dt$	4.5	V/ns
Power Dissipation	$P_D$	55	W
Junction Temperature Range	$T_J$	150	$^\circ C$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ C$
Operating Temperature	$T_{OPR}$	-55 to +150	$^\circ C$
Thermal Resistance (Junction to Ambient)	$R_{\theta JA}$	110	$^\circ C/W$
Thermal Resistance (Junction to Case)	$R_{\theta JC}$	2.27	$^\circ C/W$

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. Pulse width limited by  $T_{J(MAX)}$

3.  $L = 14mH$ ,  $I_{AS} = 6A$ ,  $V_{DD} = 90V$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ C$

4.  $I_{SD} \leq 6.2A$ ,  $di/dt \leq 200A/\mu s$ ,  $V_{DD} \leq B_{VDSS}$ , Starting  $T_J = 25^\circ C$

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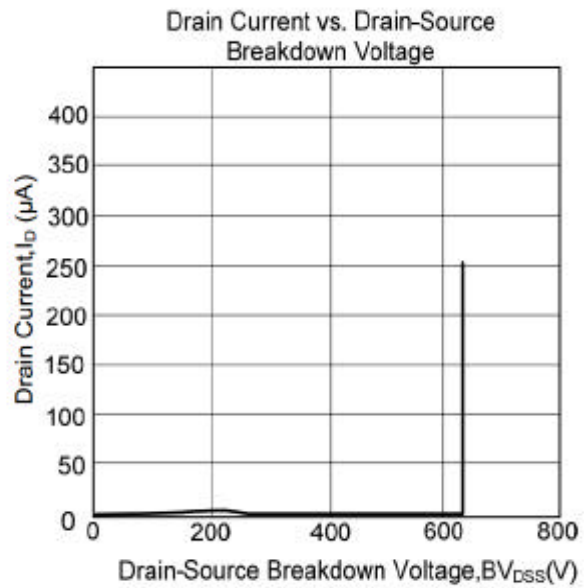
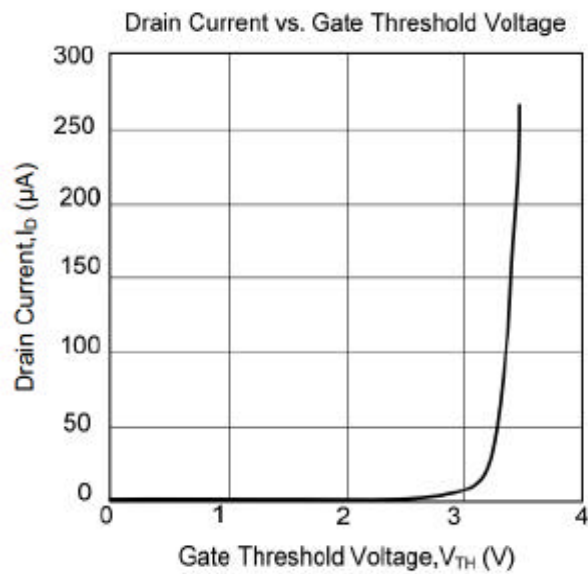
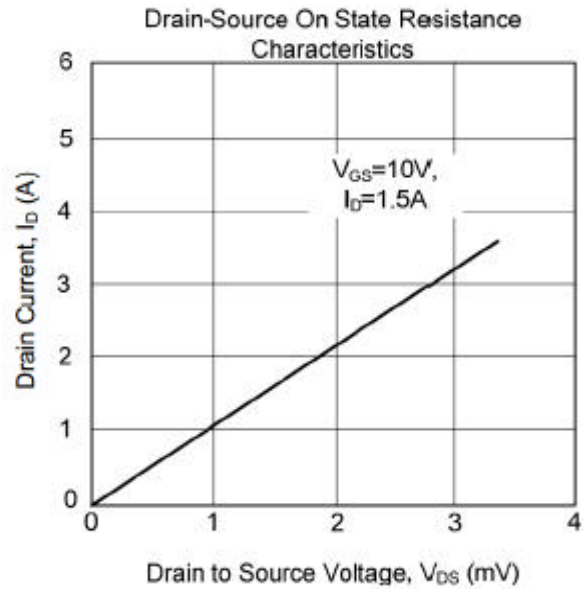
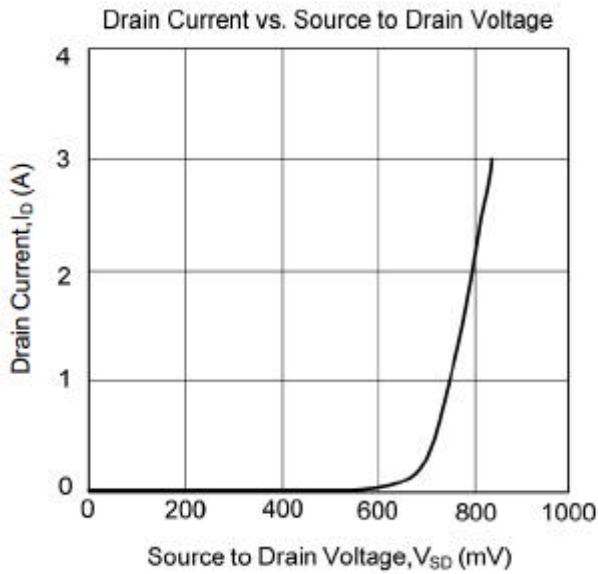
## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ Unless otherwise Specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0, I_D = 250\mu\text{A}$	600			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D = 250\mu\text{A}$ , Reference to $25^\circ\text{C}$		0.53		V/ $^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 600\text{V}, V_{GS} = 0\text{V}$			10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}, V_{GS} = \pm 30\text{V}$			$\pm 100$	nA
Gate - Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.0		4.0	V
Static Drain - Source On -State Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 3.1\text{A}$		1.0	1.5	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS} = 25\text{V}$		700	1000	pF
Output Capacitance	$C_{oss}$	$V_{GS} = 0$		95	120	
Reverse Transfer Capacitance	$C_{rss}$	$f = 1.0\text{ MHz}$		10	13	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 300\text{V}, I_D = 6.2\text{A}, R_G = 25\Omega^{(1), (2)}$		20	50	ns
Turn-On Rise Time	$t_r$			70	150	
Turn-Off Delay Time	$t_{d(off)}$			40	90	
Turn-Off Fall Time	$t_f$			45	100	
Total Gate Charge	$Q_g$	$V_{DS} = 480\text{V}, I_D = 6.2\text{A}, V_{GS} = 10\text{V}^{(1), (2)}$		20	25	nC
Gate - Source Charge	$Q_{gs}$			4.9		
Gate - Drain Charge	$Q_{gd}$			9.4		
Continuous Drain Source Diode Forward Current	$I_S$				6.2	A
Pulsed Drain Source Diode Forward Current	$I_{SM}$				24.8	
Drain - Source Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0, I_S = 6.2\text{A}$			1.4	V
Reverse Recovery Time	$t_{rr}$	$I_S = 6.2\text{A}, dI_F/dt =$		300		ns
Reverse Recovery Charge	$Q_{rr}$	$100\text{A}/\mu\text{s}, V_{GS} = 0\text{V}^{(1)}$		2.35		

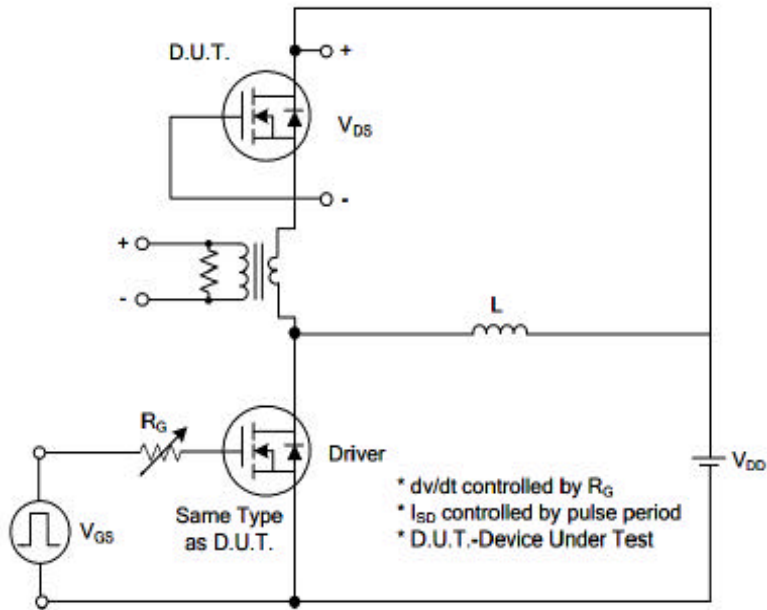
Notes : 1. Pulse Test : Pulse width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

2. Essentially independent of operating temperature.

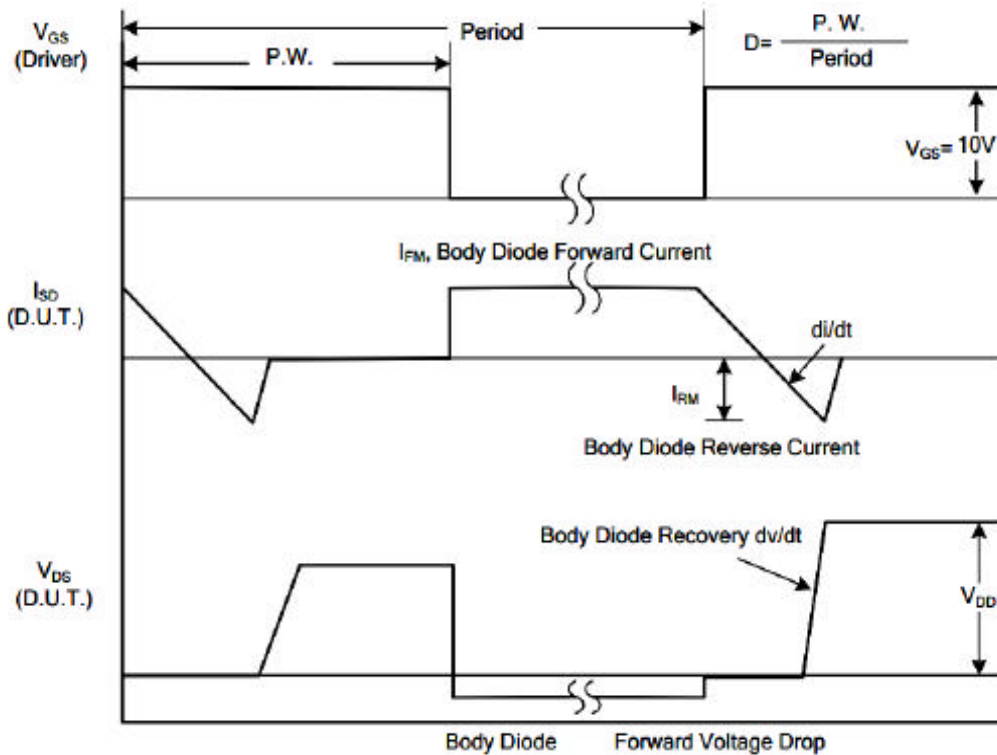
## TYPICAL CHARACTERISTICS CURVES



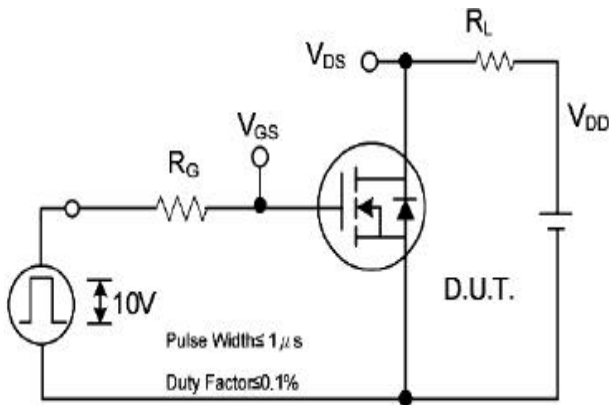
## TEST CIRCUITS AND WAVEFORMS



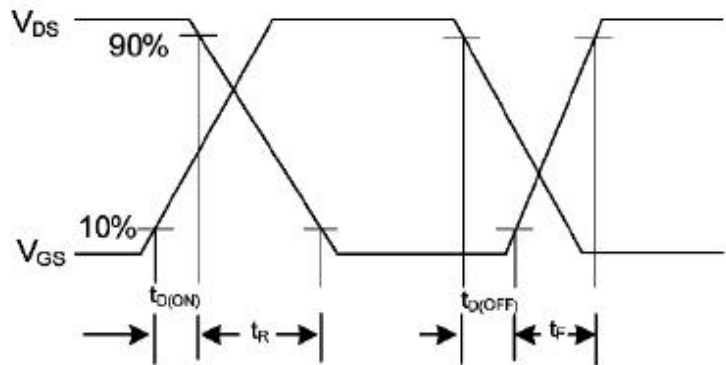
Peak Diode Recovery  $dv/dt$  Test Circuit



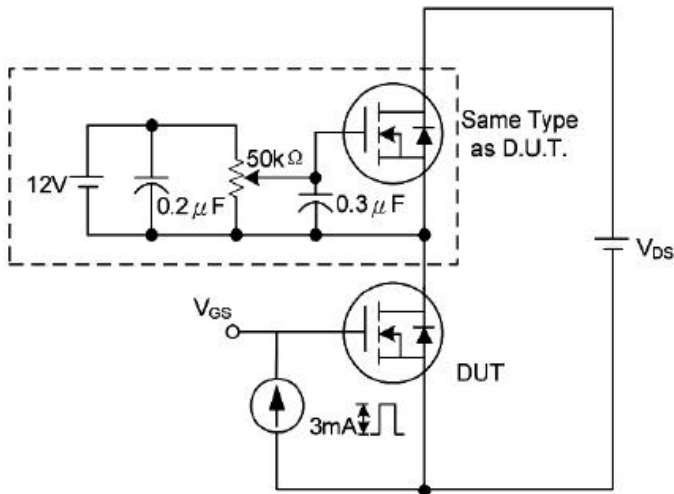
Peak Diode Recovery  $dv/dt$  waveform



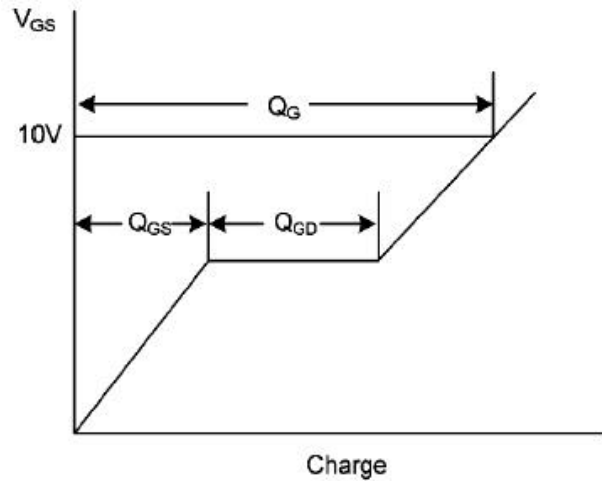
**Switching Test Circuit**



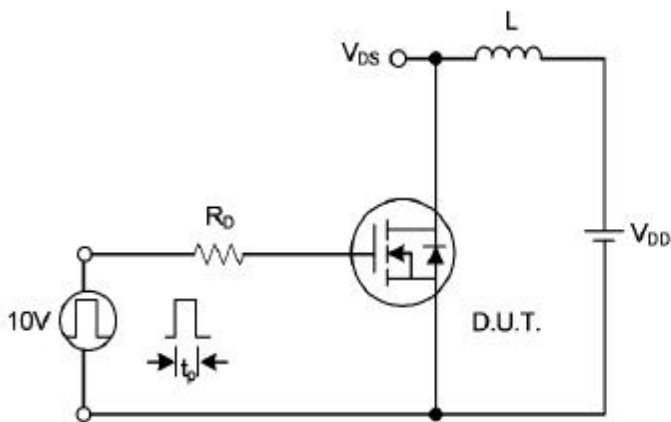
**Switching Waveforms**



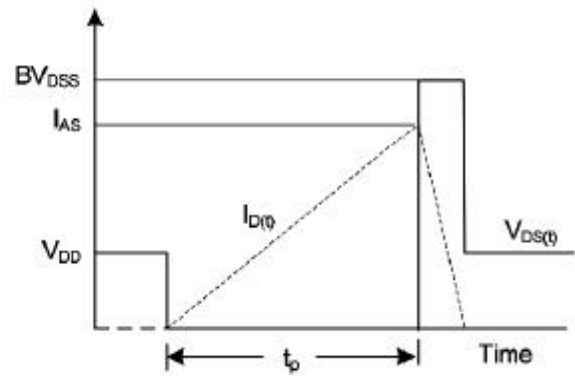
**Gate Charge Test Circuit**



**Gate Charge Waveform**

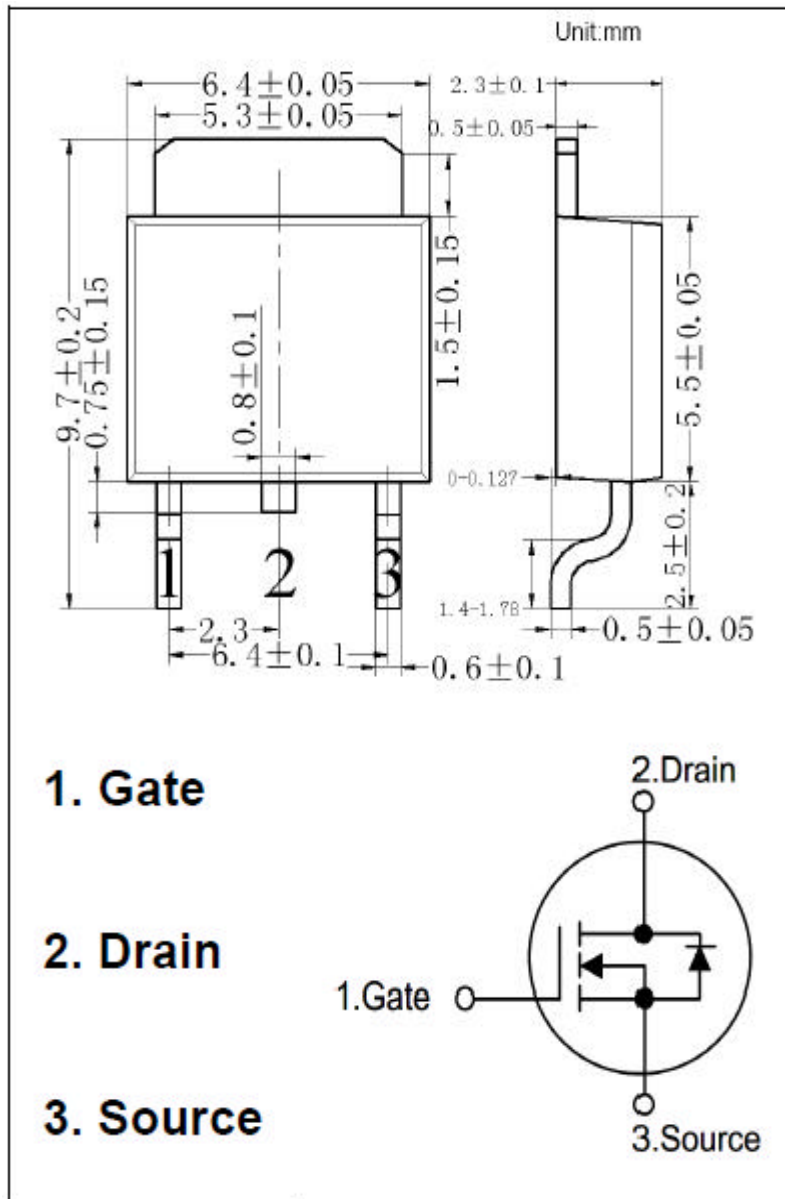


**Unclamped Inductive Switching Test Circuit**



**Unclamped Inductive Switching Waveforms**

## PACKAGE OUTLINE AND DIMENSION





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