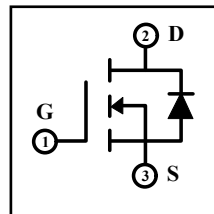


1 Description

These N-channel enhancement mode power mosfets used advanced trench technology design, provided excellent $R_{DS(on)}$ and low gate charge. Which accords with the RoHS standard.



$$V_{DS} = 60V$$

$$R_{DS(on)} (TYP) = 10m\Omega$$

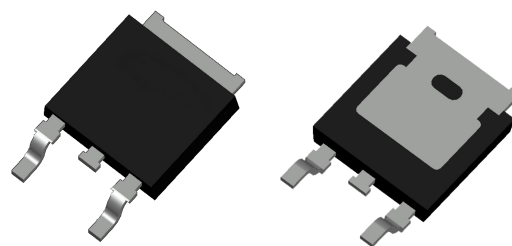
$$I_D = 60A$$

2 Features

- Low on resistance
- Low gate charge
- Fast switching
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔV_{DS} test

3 Applications

- Power switching applications
- Inverter management system
- Electric tools
- Automotive electronics



TO-252

4 Electrical Characteristics

4.1 Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

Parameter		Symbol	Rating	Units
Drain-to-Source Voltage		V_{DS}	60	V
Gate-to-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ C$	I_D	60	A
	$T_C = 100^\circ C$		35	A
Pulsed Drain Current ⁽¹⁾		I_{DM}	240	A
Single Pulse Avalanche Energy ⁽⁴⁾		E_{AS}	210	mJ
Power Dissipation	$T_a = 25^\circ C$	P_{tot}	2	W
	$T_C = 25^\circ C$	P_{tot}	104	W
Junction Temperature Range		T_j	-55 ~ 150	°C
Storage Temperature Range		T_{stg}	-55 ~ 150	°C

4.2 Thermal Characteristics

Parameter	Symbol	Value		Units
		Typ	Max	
Thermal Resistance, Junction to Case-sink	R_{thJC}	1.2	1.6	°C/W
Thermal Resistance, Junction to Ambient	R_{thJA}	—	75	°C/W

4.3 Electrical Characteristics (Tc=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Value			Units
			Min	Typ	Max	
Off Characteristics						
Drain-to-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	60	---	---	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V, T _C =25℃	---	---	1	μA
		V _{DS} =60V, V _{GS} =0V, T _C =125℃	---	---	100	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Drain-to-Source on-state Resistance	R _{DS(on)}	V _{GS} =10V, I _D =30A	---	10	12	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =30V, f=1.0MHz	---	1796	---	pF
Output Capacitance	C _{oss}		---	149	---	
Reverse Transfer Capacitance	C _{rss}		---	119	---	
Gate Resistance	R _G	V _{DD} =0V, V _{GS} =0V, F=1MHz	---	1.8	---	Ω
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	I _D =15A, V _{DD} =30V, V _{GS} =10V, V _{GEN} =25Ω	---	28	---	nS
Turn-on Rise Time	t _r		---	80	---	
Turn-off Delay Time	t _{d(off)}		---	78	---	
Turn-off Fall Time	t _f		---	67	---	
Total Gate Charge	Q _g	I _D =15A, V _{DD} =30V, V _{GS} =10V	---	32.5	---	nC
Gate-to-Source Charge	Q _{gs}		---	12	---	
Gate-to-Drain(“Miller”) Charge	Q _{gd}		---	9	---	
Drain-Source Diode Characteristics						
Diode Forward Voltage ⁽³⁾	V _{SD}	V _{GS} =0V, I _S =60A	---	---	1.3	V
Diode Forward Current	I _S		---	---	60	A
Reverse Recovery Time	t _{rr}	T _J =25℃, I _F =30A, di/dt=100A/μs, V _{GS} =0V	---	20	---	nS
Reverse Recovery charge	Q _{rr}		---	17	---	nC

Notes:

1: Repetitive rating, pulse width limited by maximum junction temperature.

2: Surface mounted on FR4 Board, t_s≤10sec.

3: Pulse width ≤ 300μs, duty cycle ≤ 2%.

4: L=0.5mH, V_{DD}=50V, V_{GATE}=10V, Start T_J=25°C.

5 Typical characteristics diagrams

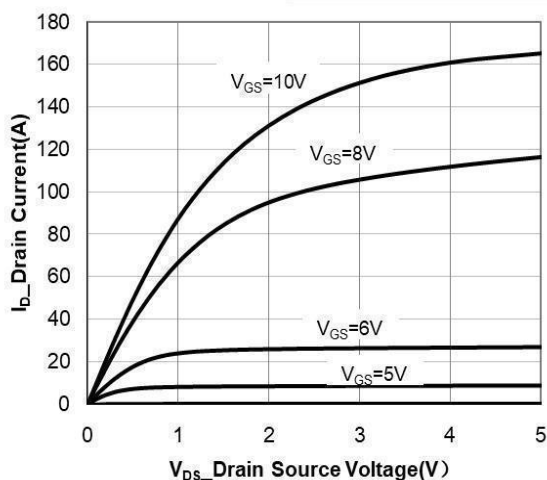


Figure 1 Output Characteristics

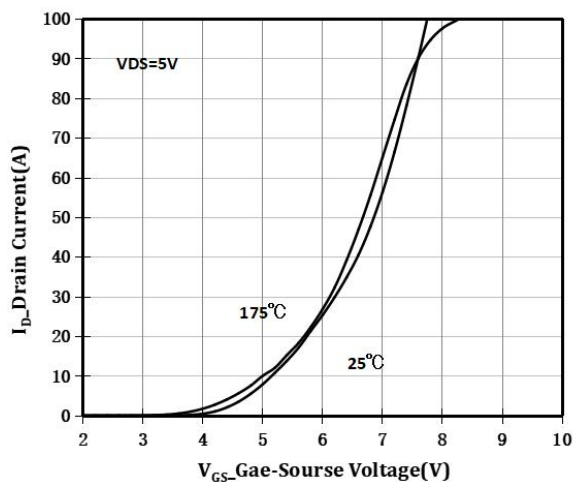


Figure 2 Transfer Characteristics

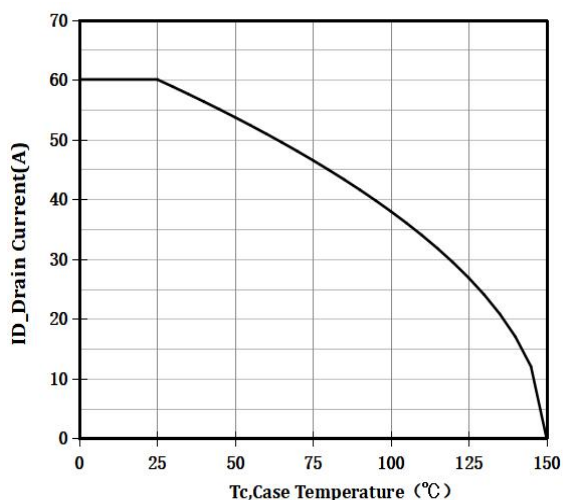


Figure 3 Current De-rating

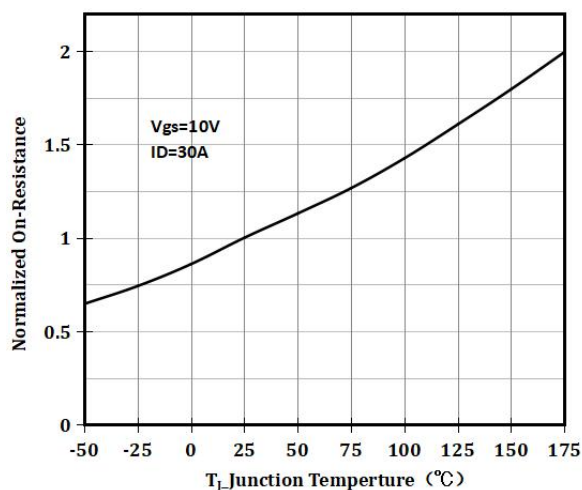


Figure 4 $R_{DS(ON)}$ -Junction Temperature

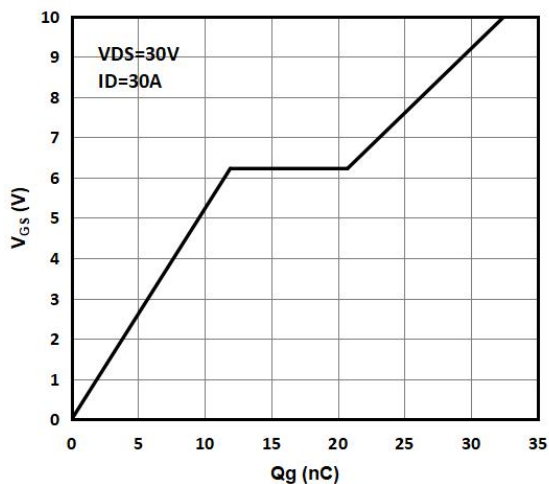


Figure 5 Gate Charge

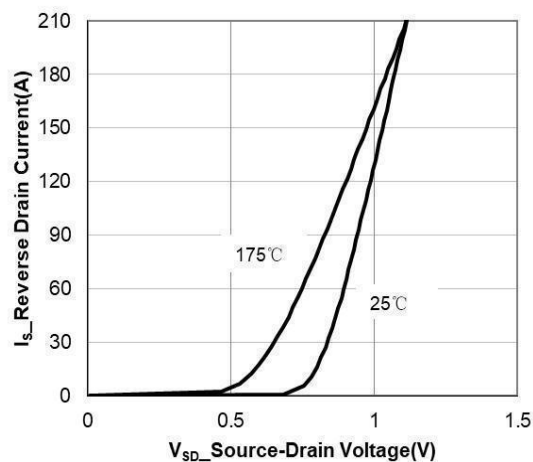


Figure 6 $V_{SD_Source-Drain\ Diode\ forward}$

5 Typical characteristics diagrams(continues)

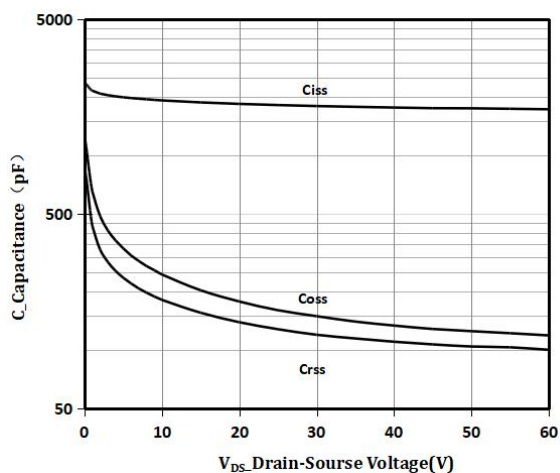


Figure 7 Capacitance Vs V_{DS}

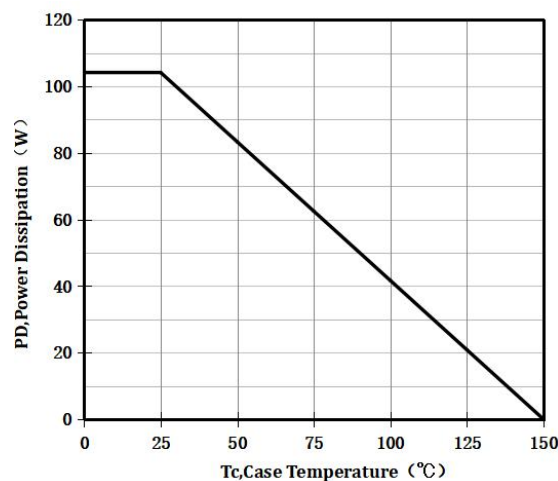


Figure 8 Power De-rating

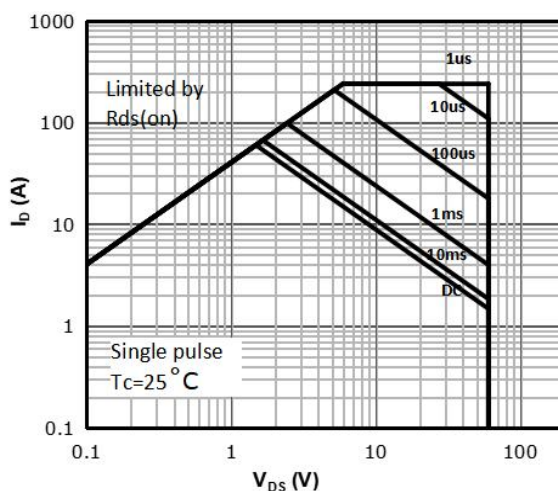


Figure 9 Safe Operation Area

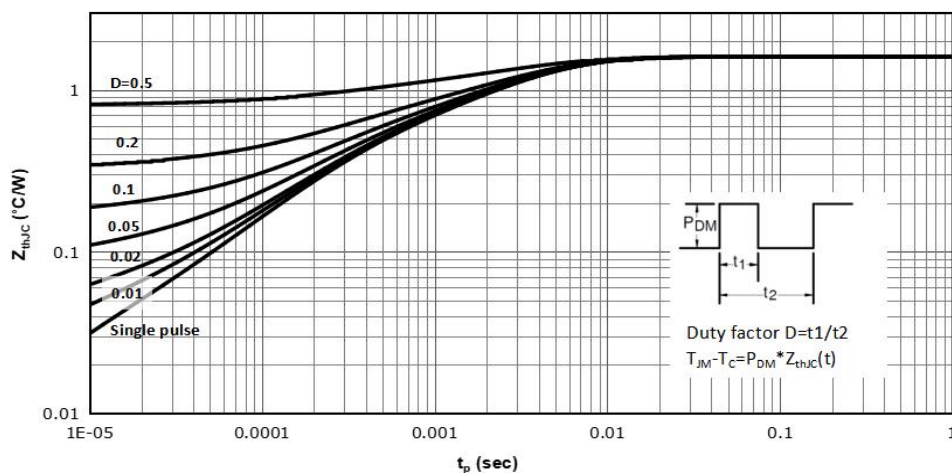
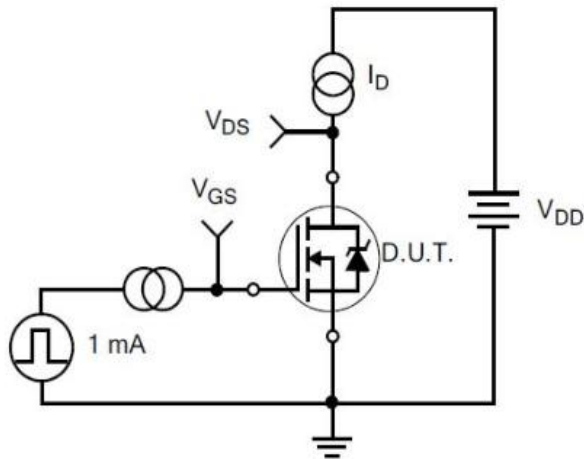
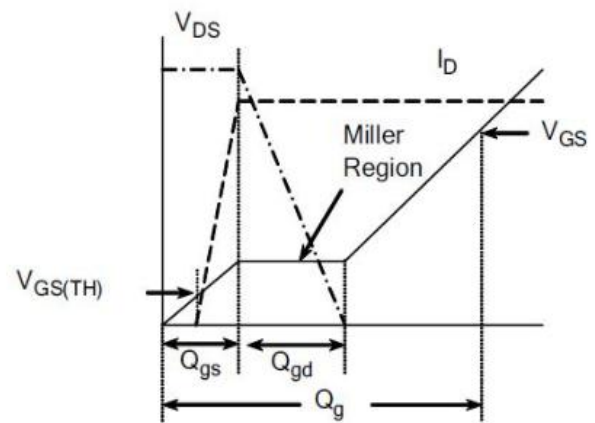


Figure 10 Normalized Maximum Transient Thermal Impedance

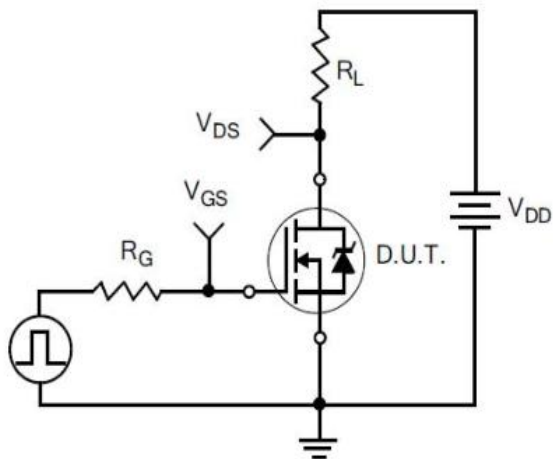
6 Typical Test Circuit and Waveform



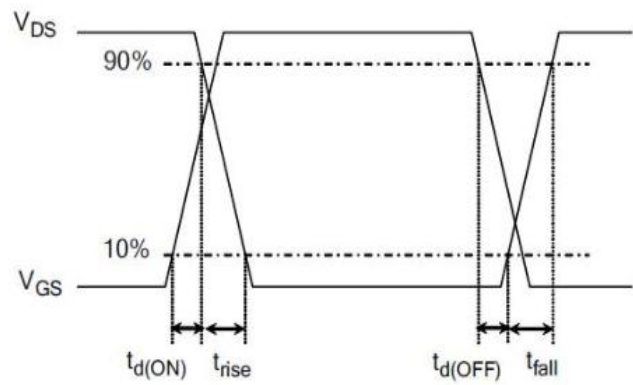
1) Gate Charge Test Circuit



2) . Gate Charge Waveform

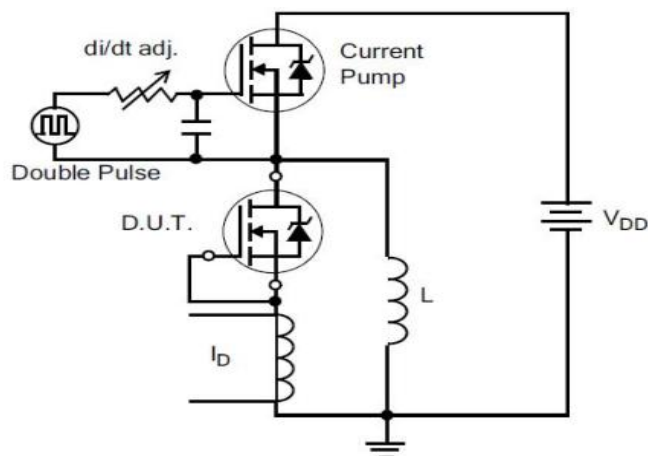


3) Resistive Switching Test Circuit

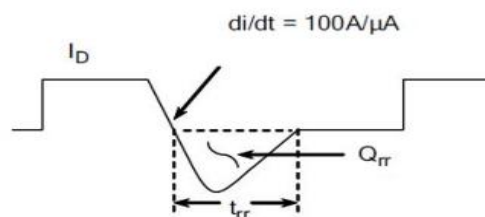


4) Resistive Switching Waveforms

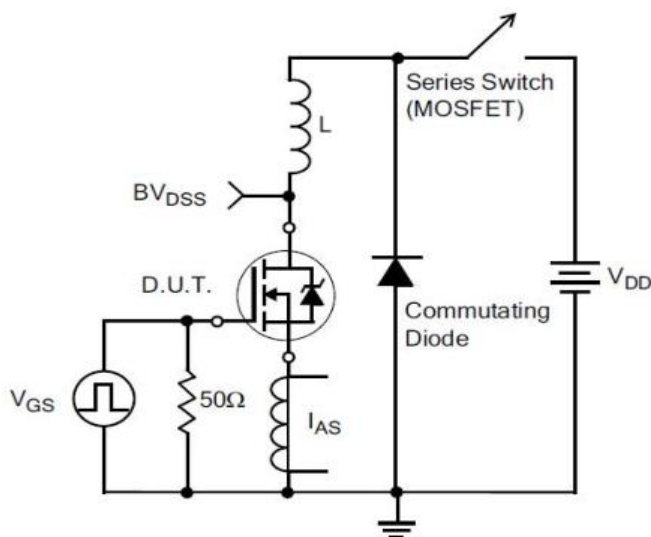
6 Typical Test Circuit and Waveform(continues)



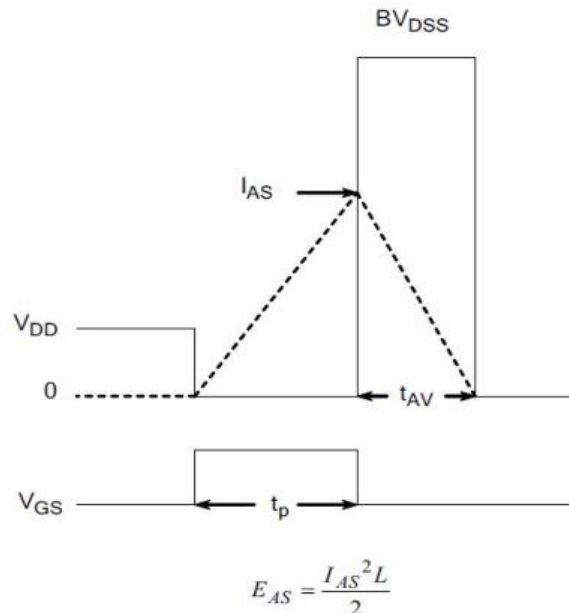
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform



7) . Unclamped Inductive Switching Test Circuit



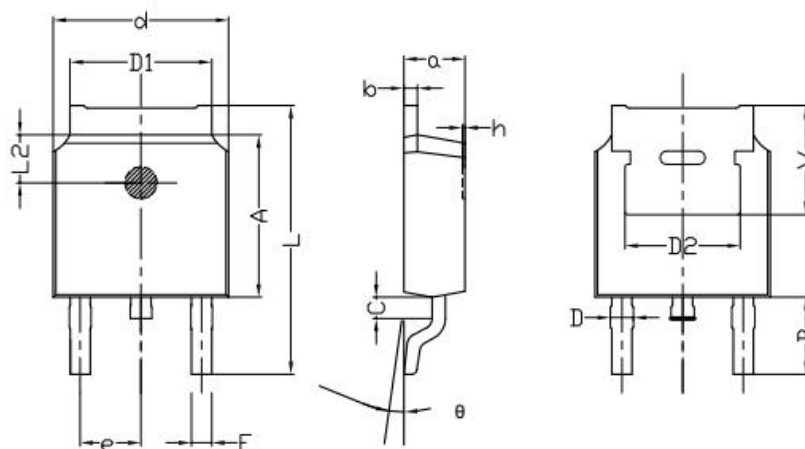
8) Unclamped Inductive Switching Waveforms

7 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
PJD45N06A_L2_00001-CN	TO-252	CD10RN06H	Pb-free	Tape & Reel	2500/reel

8 Dimensions(continues)

TO-252B PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
a	2.20	2.40	0.087	0.095
b	0.46	0.58	0.018	0.023
c	0.70	0.90	0.028	0.035
D	0.80	1.00	0.032	0.039
d	6.30	6.70	0.248	0.264
D1	5.00	5.50	0.197	0.217
D2	TYP 4.83		TYP 0.190	
A	5.80	6.20	0.228	0.244
e	2.19	2.39	0.086	0.094
L	9.40	10.40	0.370	0.409
B	2.6	3.2	0.102	0.126
L2	1.5	1.8	0.059	0.071
theta	0	8	0	8
h	0	0.3	0	0.012
V	5.25	5.85	0.207	0.230
E	0.6	0.8	0.024	0.032

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