UMW STD35NF06L

60V N-Channel MOSFET

1.Description

The STD35NF06L uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It ca n be used in a wide variety of applications.

2.1Features

- $V_{DS\ (V)}$=60V
- I_D=35A
- $R_{DS(ON)}$<12mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<16mΩ(V_{GS}=4.5V)

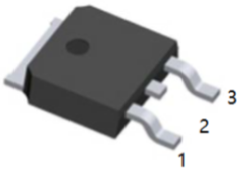
2.2Features

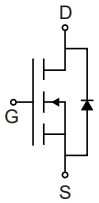
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

3.Pinning information

Pin	Symbol	Description
1	G	GATE
3	S	SOURCE
2	D	DRAIN

TO-252(DPAK)
top view





4.Absolute Maximum Ratings T_A= 25°C

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	
Drain Current-Continuous[Note3]	T_C=25°C	I_D	35	A
	T_C=100°C		25	
Drain Current-Pulsed[Note1]		I_{DM}	140	
Avalanche Energy[Note4]		E_{AS}	72	mJ
Maximum Power Dissipation	T_C=25°C	P_D	105	W
Storage Temperature Range		T_{STG}	-55 to 150	°C
Operating Junction Temperature Range		T_J	-55 to 150	°C

5.Thermal Resistance Rating

Parameter	Symbol	Typ	Max	Units
Thermal Resistance,Junction-to-Case	R_{thJC}		1.4	°C/W

6.Specifications (T_J= 25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_{DS}=250μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTIC						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_{DS}=30A		12	20	mΩ
		V_{GS}=4.5V, I_{DS}=20A		16		mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz		1300		pF
Output Capacitance	C_{oss}			300		pF
Reverse Transfer Capacitance	C_{rss}			105		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=30V R_{GEN}=4.7Ω, I_D=27.5A		20		ns
Rise Time	t_r			50		ns
Turn-Off Delay Time	$t_{D(off)}$			36		ns
Fall Time	t_f			15		ns
Total Gate Charge at 10V	Q_g	V_{DS}=30V, I_{DS}=55A, V_{GS}=10V		44.5	60	nC
Gate to Source Gate Charge	Q_{gs}			10.5		nC
Gate to Drain“Miller”Charge	Q_{gd}			17.5		nC

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{DS}=35A			1.5	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=25A		75		nS
Reverse Recovery Charge	Q_{rr}	dI/dt=100A/μs		170		uC

Notes:

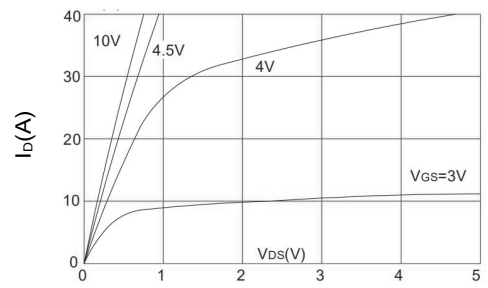
1: Repetitive rating, pulse width limited by maximum junction temperature.

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

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

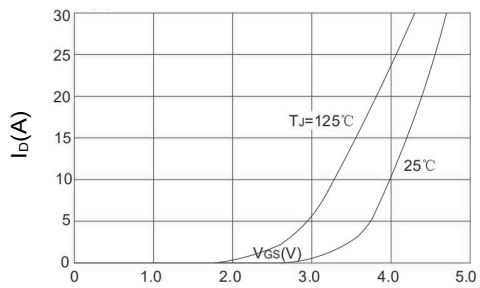
4: E_{AS} condition: L=0.5mH,V_{DD}=10V, V_G=10V, V_{GATE}=20V,Start T_J=25°C.

7.1Typical Characterisitics



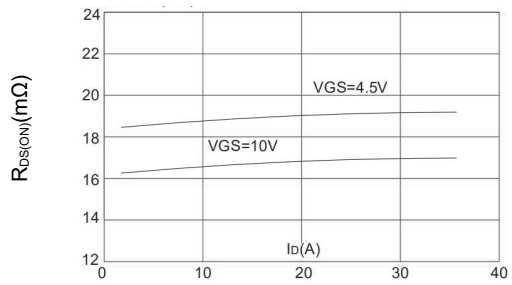
V_{DS}(V)

Figure 1: Output Characteristics



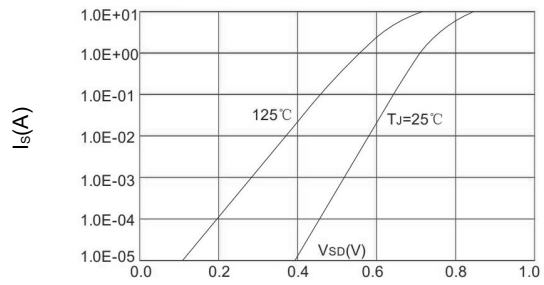
V_{GS}(V)

Figure 2: Typical Transfer Characteristics



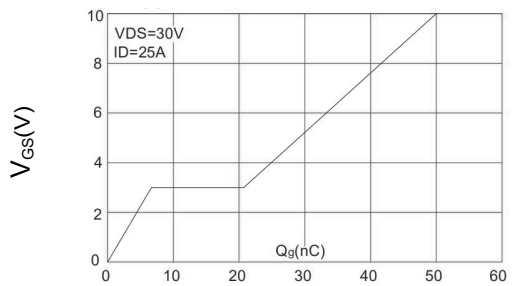
I_D(A)

Figure 3: On-resistance vs. Drain Current



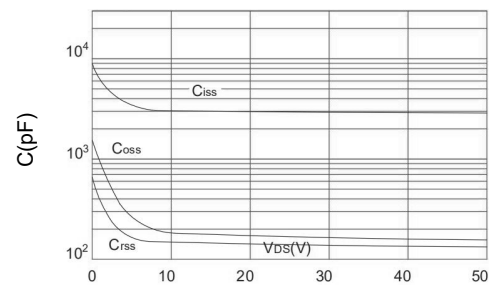
V_{SD}(V)

Figure 4: Body Diode Characteristics



Q_g(nC)

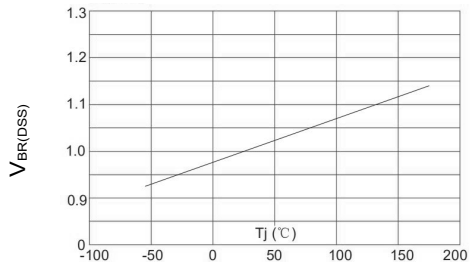
Figure 5: Gate Charge Characteristics



V_{DS}(V)

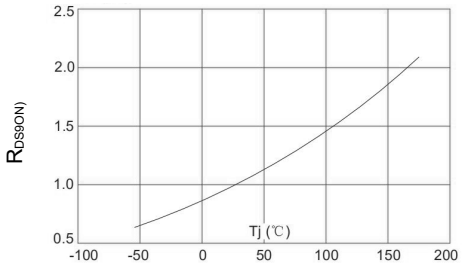
Figure 6: Capacitance Characteristics

7.2Typical Characterisitics



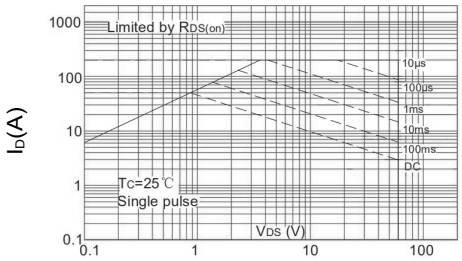
T_J(°C)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature



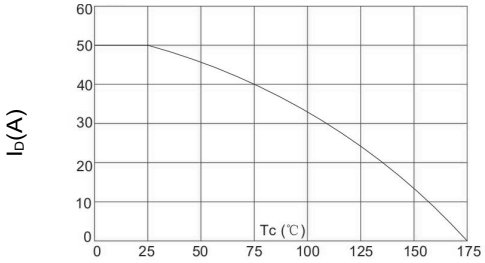
T_J(°C)

Figure 8: Normalized on Resistance vs Junction Temperature



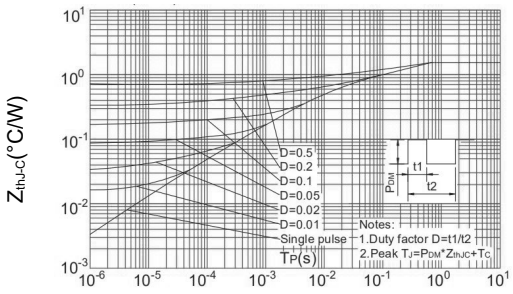
V_{DS}(V)

Figure 9: Maximum Safe Operating Area



T_C(°C)

Figure 10: Maximum Continuous Drain Currentvs. Case Temperature



Tp(s)

Figure 11: Maximum EffectiveTransient ThermalImpedance, Junction-to-Case

7.3Typical Characterisitics

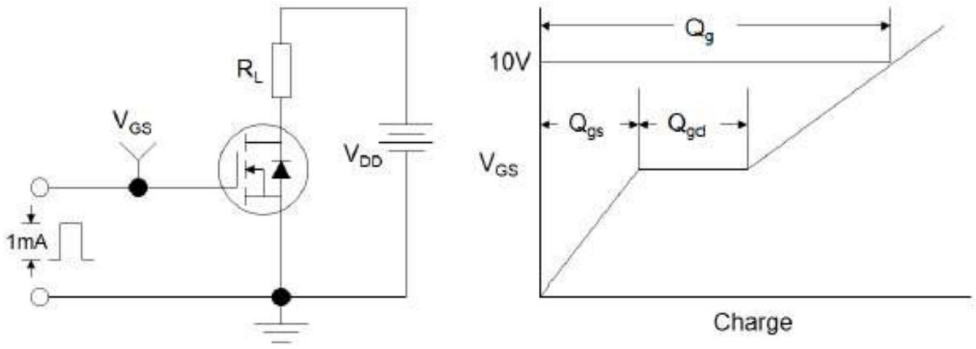


Figure1:Gate Charge Test Circuit & Waveform

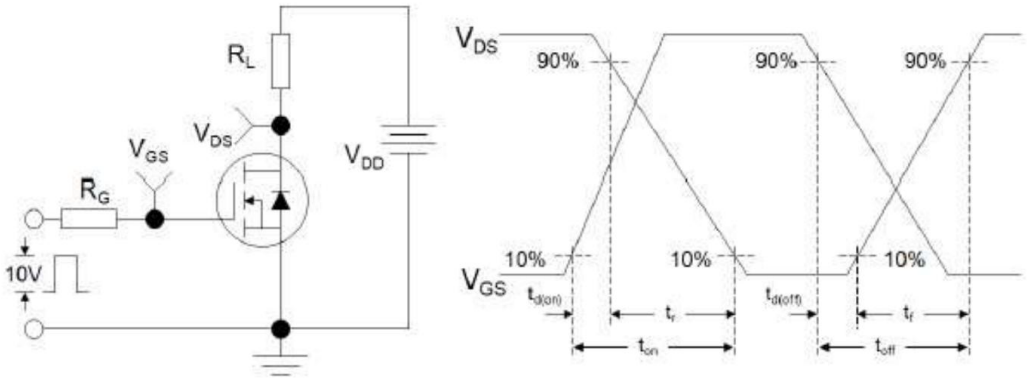


Figure 2: Resistive Switching Test Circuit & Waveforms

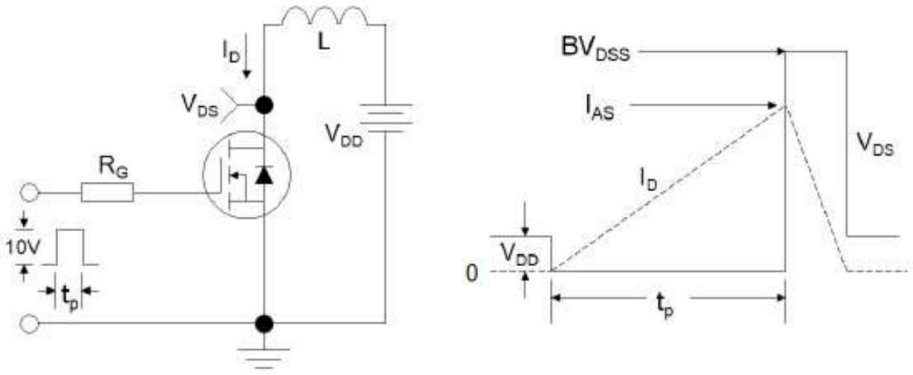
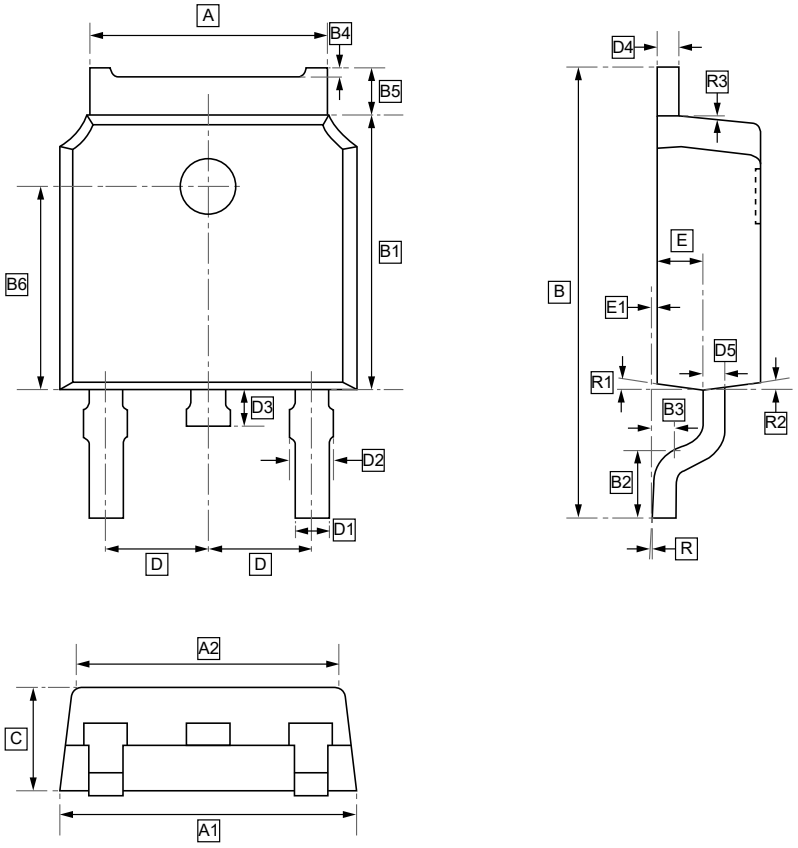


Figure 3:Unclamped inductive Switching Test Circuit & Waveforms

8.TO-252 Package Outline Dimensions

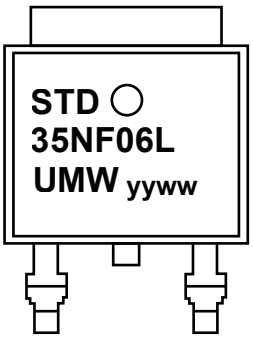


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	B	B1	B2	B3	B4	B5	B6	C	D
Min	5.1	6.4	5.6	9.5	5.9	1.35	0.4	0.1	0.85	4.35	2.15	2.286
Max	5.5	6.8	6.0	10.3	6.3	1.65	0.6	(typ.)	1.05	4.65	2.45	(typ.)

Symbol	D1	D2	D3	D4	D5	E	E1	R	R1	R2	R3
Min	0.66	0.81	0.65	0.42	0.42	0.86	0.05	0°	7°	7°	7°
Max	0.86	1.01	0.95	0.58	0.58	1.16	0.05	6°	(typ.)	(typ.)	(typ.)

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW STD35NF06L	TO-252	2500	Tape and reel

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