

1.Description

The STD30NF06L uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

2.2Features

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

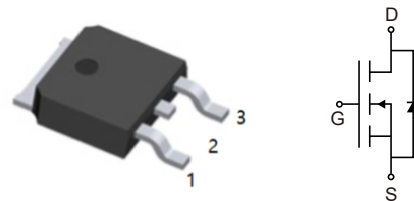
2.1Features

- $V_{DS(V)}=60V$
- $I_D=30A$
- $R_{DS(ON)}<23m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<29m\Omega(V_{GS}=4.5V)$

3.Pinning information

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

TO-252(DPAK)
top view



4.Absolute Maximum Ratings $T_A=25^{\circ}C$

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	
Drain Current-Continuous ^{Note3}	$T_C=25^{\circ}C$	I_D	30	A
	$T_C=100^{\circ}C$		20	
Drain Current-Pulsed ^{Note1}		I_{DM}	120	
Avalanche Energy ^{Note4}		E_{AS}	72	mJ
Maximum Power Dissipation	$T_C=25^{\circ}C$	P_D	55	W
Storage Temperature Range		T_{STG}	-55 to 150	$^{\circ}C$
Junction Temperature Range		T_J	-55 to 150	$^{\circ}C$



5. Thermal Resistance Rating

Parameter	Symbol	Typ	Max	Units
Thermal Resistance, Junction-to-Case	R_{thJC}		2.7	°C/W

6. Specifications ($T_J = 25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_{DS}=250\mu A$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$			1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
ON CHARACTERISTIC						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_{DS}=15A$		23	29	m Ω
		$V_{GS}=4.5V, I_{DS}=10A$		29	40	m Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		1562		pF
Output Capacitance	C_{oss}			75.4		pF
Reverse Transfer Capacitance	C_{rss}			66.8		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=30V$ $R_{GEN}=1.8\Omega, I_D=15A$		7.5		ns
Rise Time	t_r			21		ns
Turn-Off Delay Time	$t_{D(off)}$			16		ns
Fall Time	t_f			23.5		ns
Total Gate Charge at 10V	Q_g	$V_{DS}=30V, I_{DS}=15A, V_{GS}=10V$		25		nC
Gate to Source Gate Charge	Q_{gs}			4.5		nC
Gate to Drain“Miller”Charge	Q_{gd}			6.5		nC



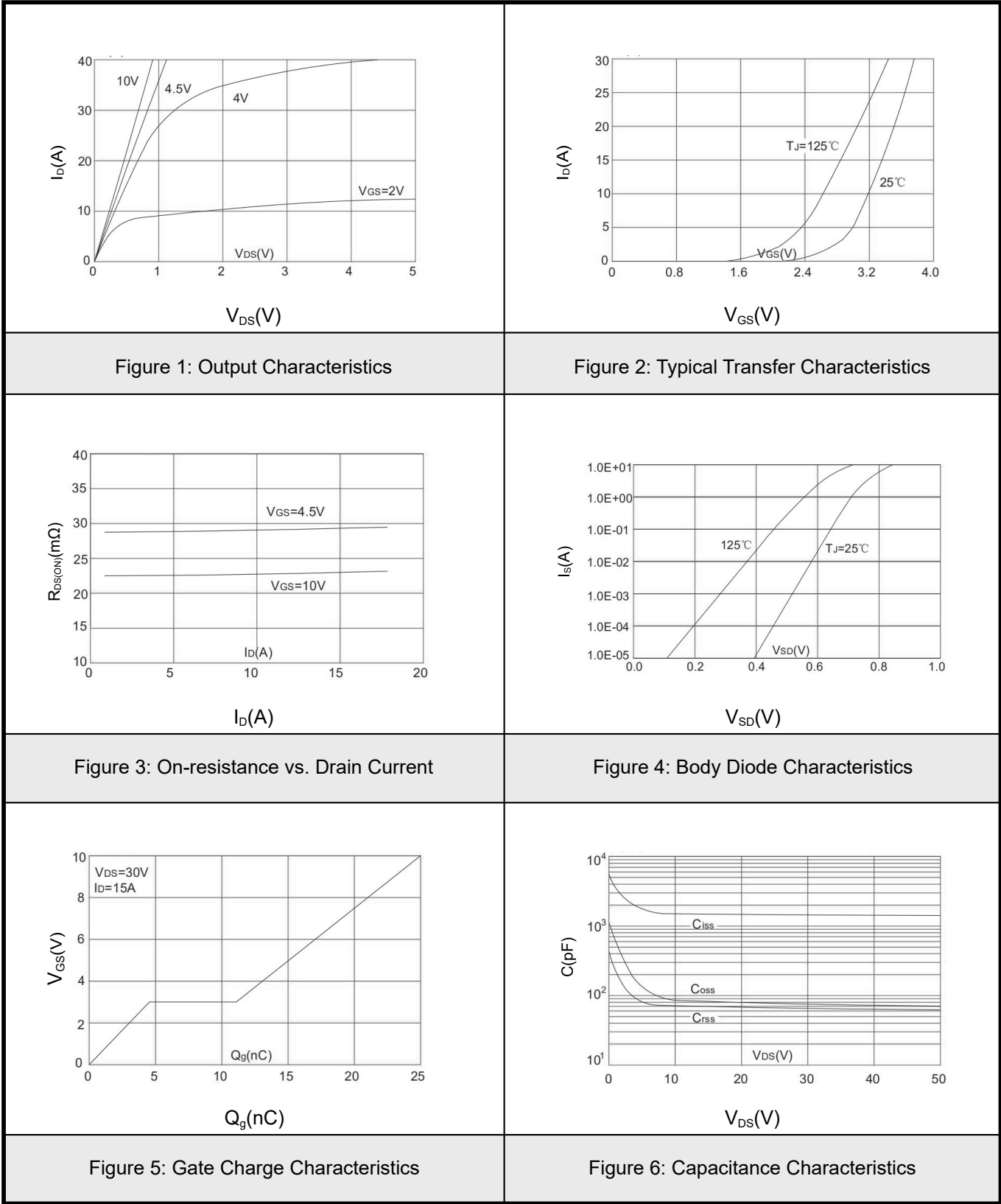
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{DS}=15A$			1.2	V
Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}C, I_F=15A$		29		nS
Reverse Recovery Charge	Q_{rr}			45		uC

Notes:

- 1: Repetitive rating, pulse width limited by maximum junction temperature.
- 2: Surface mounted on FR4 Board, $t_s \leq 10sec$.
- 3: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4: E_{AS} condition: $L=0.5mH, V_{DD}=30V, V_G=10V, V_{GATE}=60V, Start T_J=25^{\circ}C$.



7.1 Typical Characteristics





7.2 Typical Characteristics

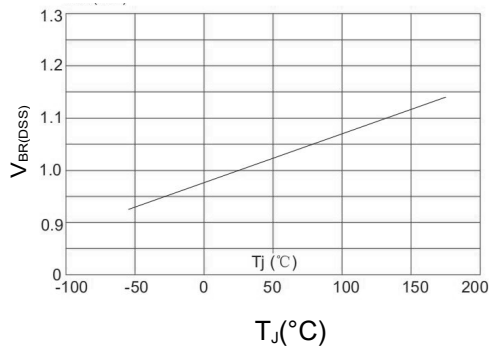


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

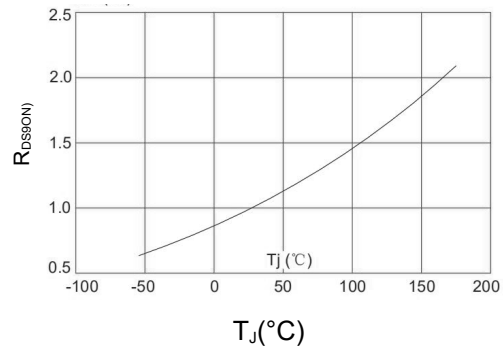


Figure 8: Normalized on Resistance vs. Junction Temperature

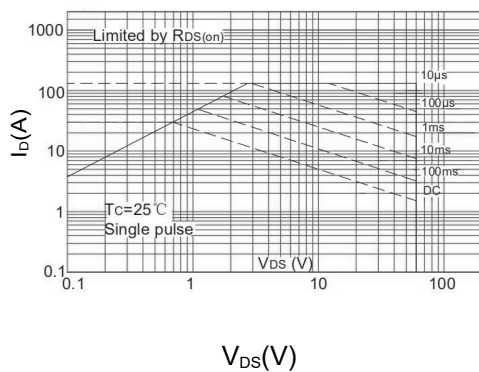


Figure 9: Maximum Safe Operating Area

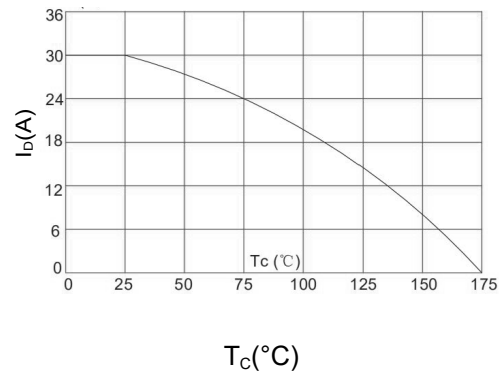


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

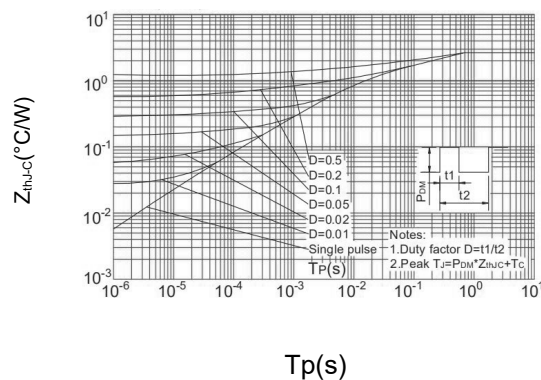


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



7.3 Typical Characteristics

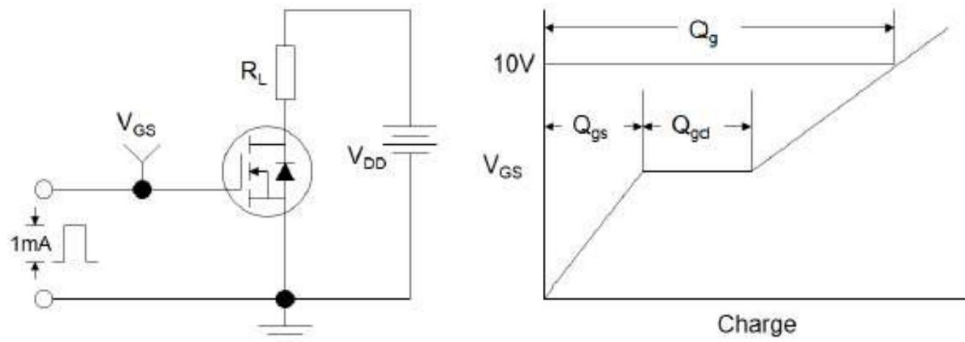


Figure1:Gate Charge Test Circuit & Waveform

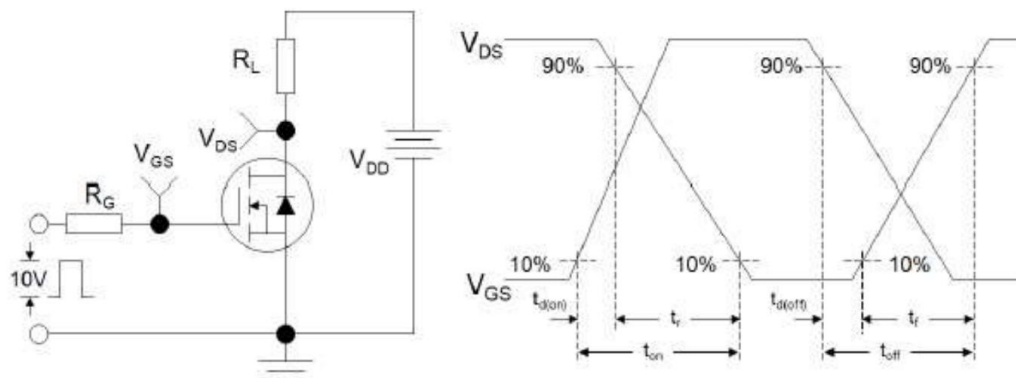


Figure 2: Resistive Switching Test Circuit & Waveforms

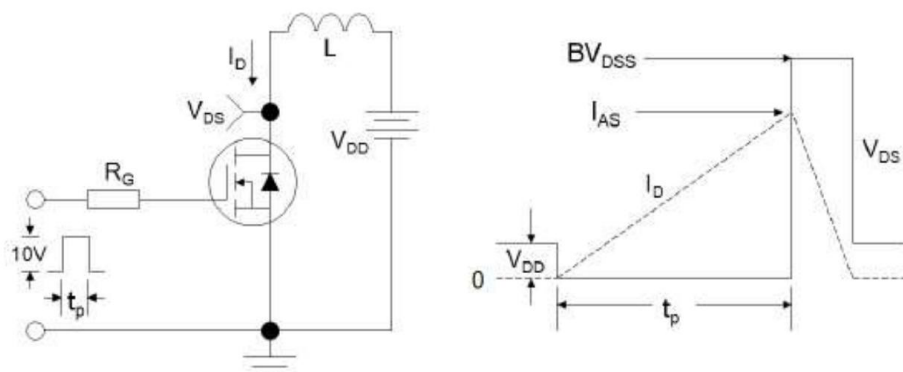
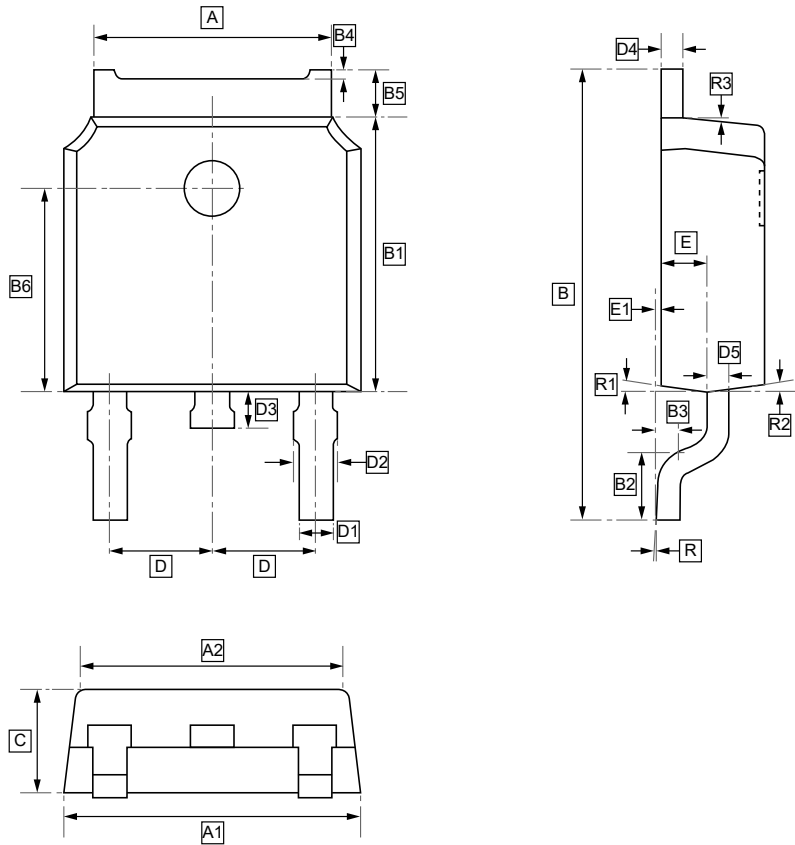


Figure 3:Unclamped inductive Switching Test Circuit & Waveforms



8.TO-252 Package Outline Dimensions



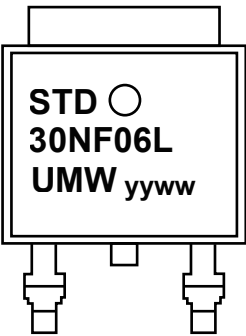
DIMENSIONS (mm are the original dimensions)

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 STD30NF06L	TO-252	2500	Tape and reel



10.Disclaimer

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