

-30V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

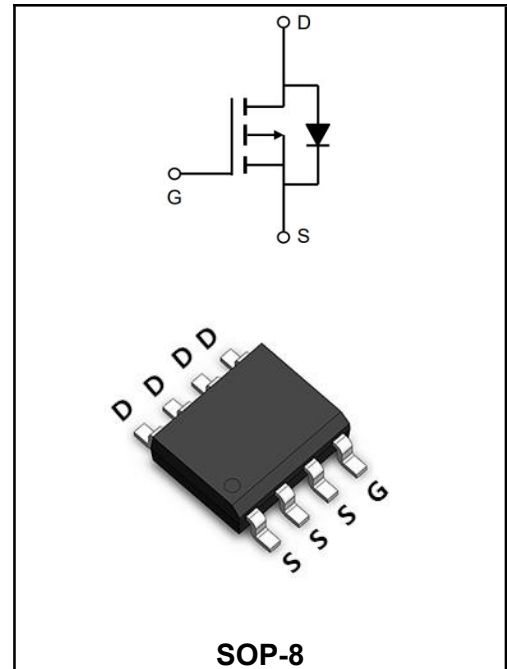
I_D	-12A
V_{DSS}	-30V
R_{DS(on)-typ}(@V_{GS}=-10V)	< 12mΩ (Typ:9.4 mΩ)

Features

- ◆Advance high cell density trench technology
- ◆Low RDS(ON) to minimize conductive loss
- ◆Low Gate Charge for fast switching

Application

- ◆Lighting
- ◆Power Supplies



Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V _{DS}	-30	V
Gate - Source Voltage	V _{GS}	± 20	V
Continuous Drain Current, T _C =25°C	I _D	-12	A
Pulsed Drain Current (T _C = 25° C, tp limited by Tjmax)'	I _{DM}	-50	A
Single Pulse Avalanche Energy ²	E _{AS}	75.6	mJ
Total Power Dissipation ³ @T _A =25°C	P _D	3	W
Total Power Dissipation ³ @T _A =70°C	P _D	2	W
Storage Temperature Range	T _{STG}	-55 to +150	°C
Operating Junction Temperature Range	T _J	-55 to +150	°C
Thermal Resistance Junction to Case ¹	R _{θJC}	20	°C/W
Thermal Resistance Junction-Ambient ⁴	R _{θJA}	42	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-30	-	-	V
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-0.9	-1.5	-2.5	V
Static Drain-Source On-Resistance ¹	$V_{GS}=-10V, I_D=-6A$	$R_{DS(ON)}$	-	9.4	12	mΩ
	$V_{GS}=-4.5V, I_D=-5A$		-	14	17	
Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	-1	μA
Gate –Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Forward Transconductance	$V_{DS}=-5V, I_D=-20A$	g_{FS}	-	20	-	S
Input Capacitance	$V_{GS} = 0V$ $V_{DS} = -15V$ $f = 1.0MHz$	C_{iss}	-	1200	-	pF
Output Capacitance		C_{oss}	-	200	-	
Reverse Transfer Capacitance		C_{rss}	-	150	-	
Turn-on delay time	$V_{DD}=-15V$ $V_{GS}=-10V$ $R_G=1\Omega$ $I_D=-10A$	$t_{d(on)}$		11	-	ns
Rise Time		T_r		28	-	
Turn-Off Delay Time		$t_{d(OFF)}$		6	-	
Fall Time		t_f		10	-	
Total Gate Charge	$I_D = -10A$ $V_{DS} = -15V$ $V_{GS} = -10V$	Q_g	-	25	-	nC
Gate-Source Charge		Q_{gs}	-	3.9	-	
Gate-Drain Charge		Q_{gd}	-	4.8	-	
Continuous Source Current ¹	$V_G=V_D=0V$, Force Current	I_S	-	-	-12	A
Pulsed Source Current		I_{SM}	-	-	-48	A
Diode Forward Voltage	$V_{GS}=0V, I_S=-20A, T_J=25^\circ C$	V_{SD}	-	-	-1.2	V
Reverse Recovery Time	$I_f=I_S$ $diF/dt=100A/\mu s$	t_{rr}	-	12.3	-	ns
Reverse Recovery Charge		Q_{rr}	-	6.3	-	nC

Note :

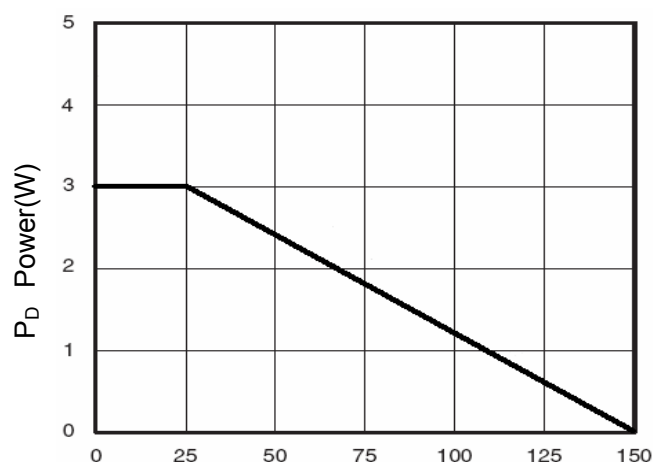
1.Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

2.The EAS data shows Max. rating.The Test condition is L=1mH, $I_D=12A, V_{DD}=-15V$;

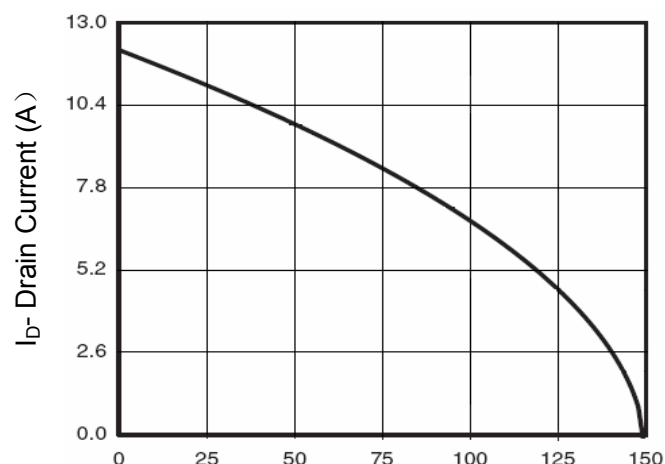
3.The Power Dissipation is limited by 150°C junction temperature;

4.Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

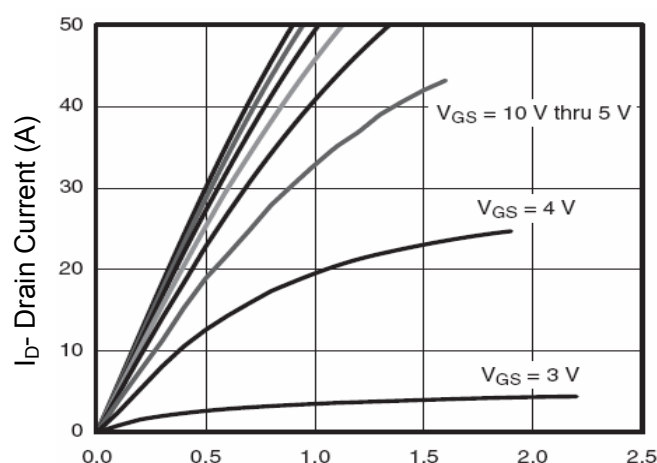
Typical Characteristics



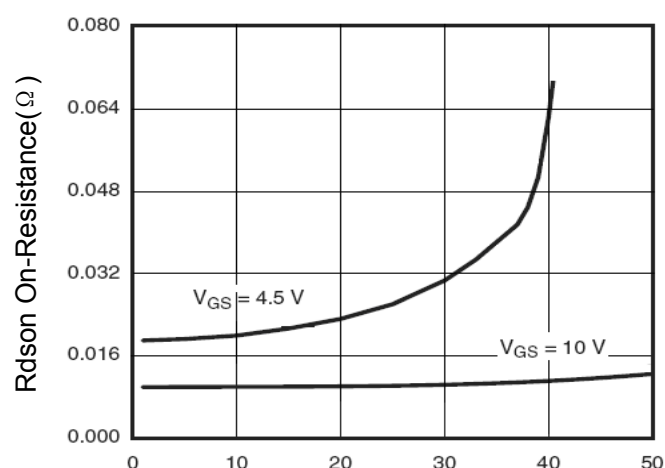
T_J -Junction Temperature(°C)
Figure 1 Power Dissipation



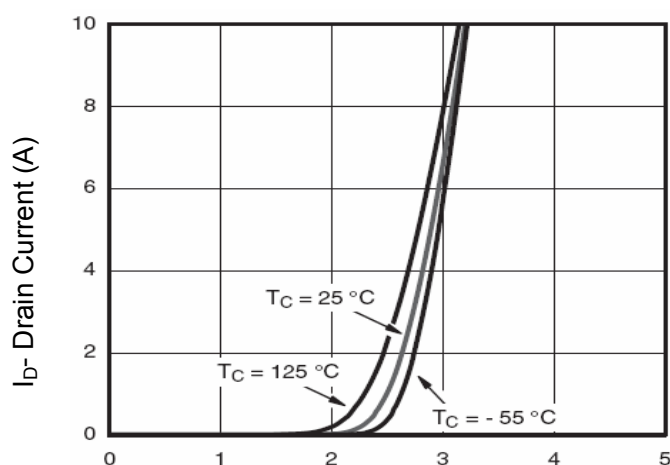
T_J -Junction Temperature(°C)
Figure 2 Drain Current



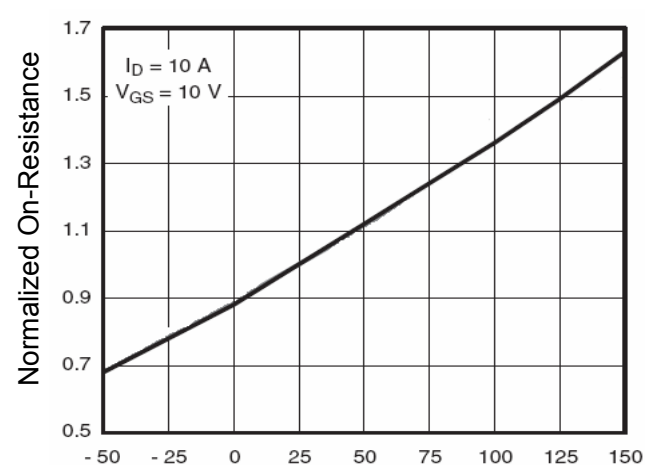
V_{DS} Drain-Source Voltage (V)
Figure 3 Output Characteristics



I_D - Drain Current (A)
Figure 4 Drain-Source On-Resistance

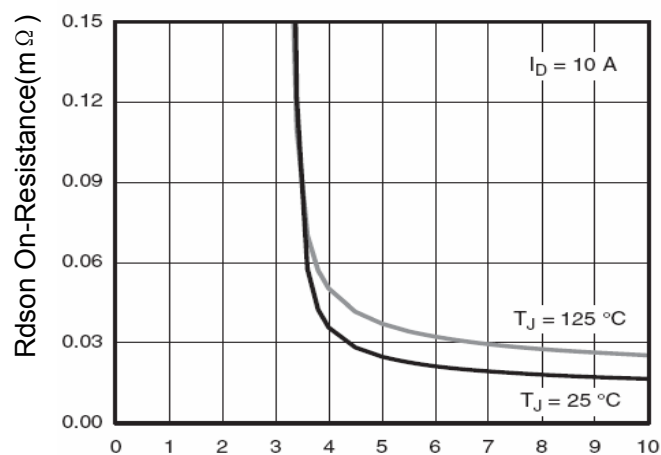


V_{GS} Gate-Source Voltage (V)
Figure 5 Transfer Characteristics

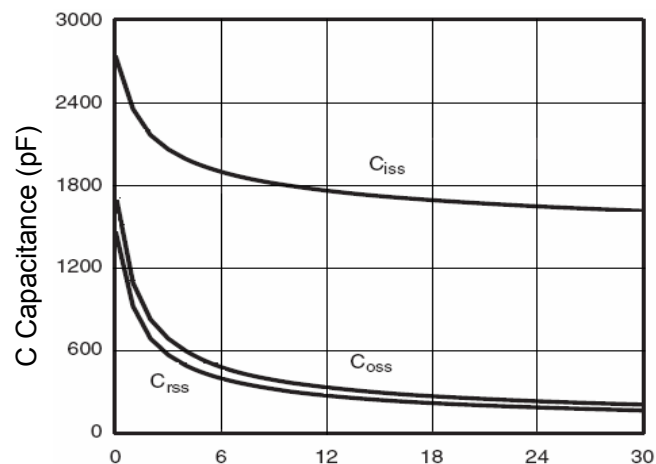


T_J -Junction Temperature(°C)
Figure 6 Drain-Source On-Resistance

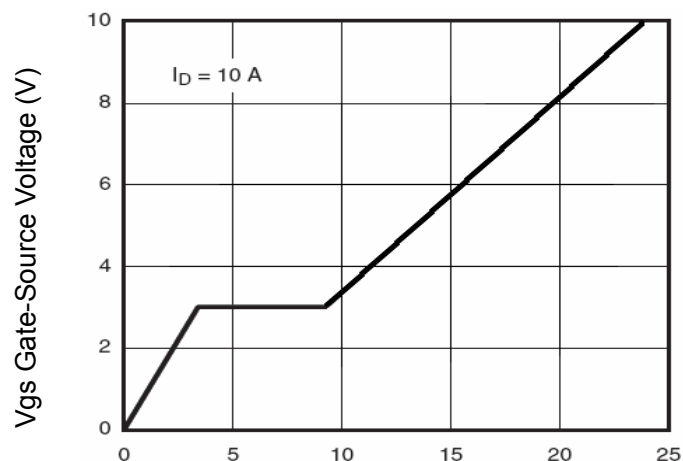
Typical Characteristics(Cont)



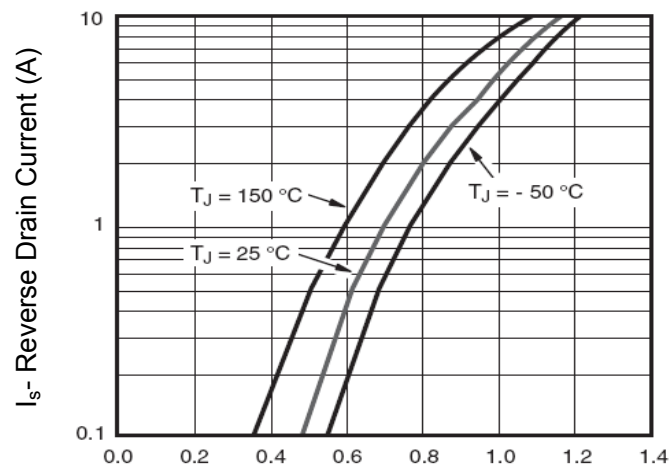
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 8 Capacitance vs Vds



Qg Gate Charge (nC)
Figure 9 Gate Charge



Vsd Source-Drain Voltage (V)
Figure 10 Source-Drain Diode Forward

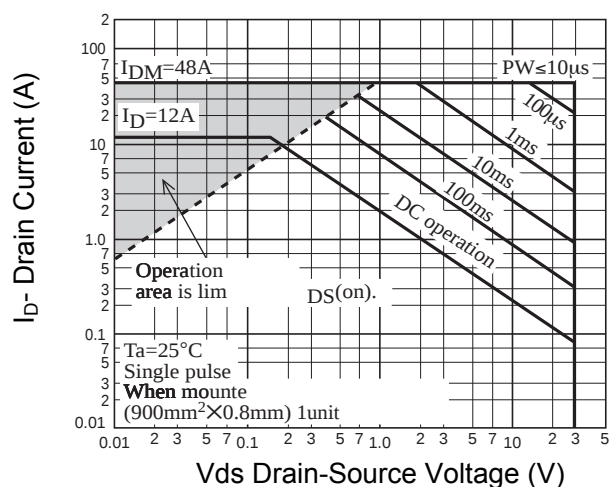


Figure 11 Safe Operation Area

Typical Characteristics(Cont)

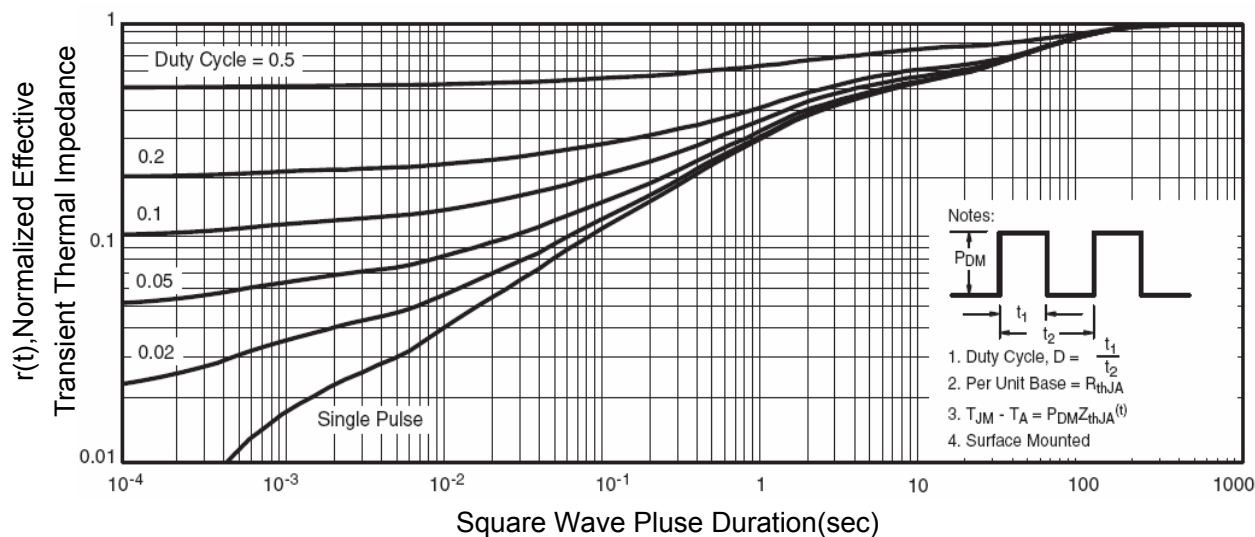


Figure 12 Normalized Maximum Transient Thermal Impedance

Test Circuits & Waveforms

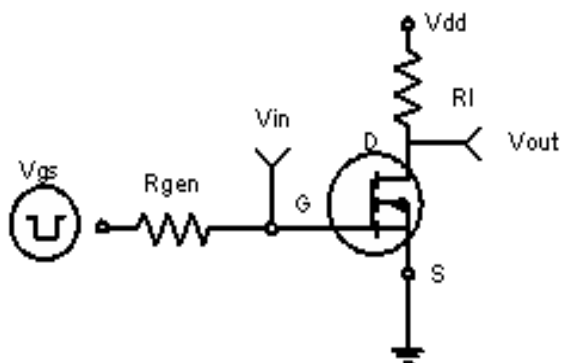


Figure 1 Switching Test Circuit

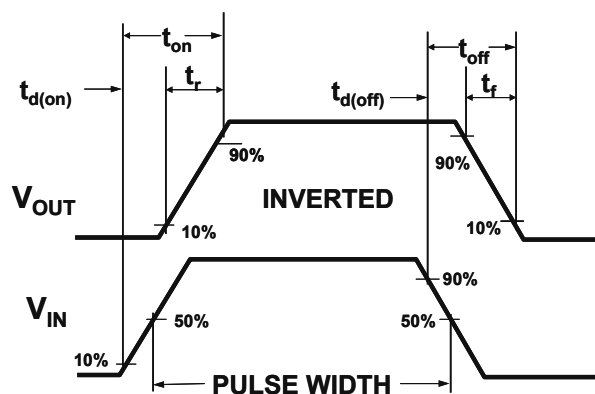
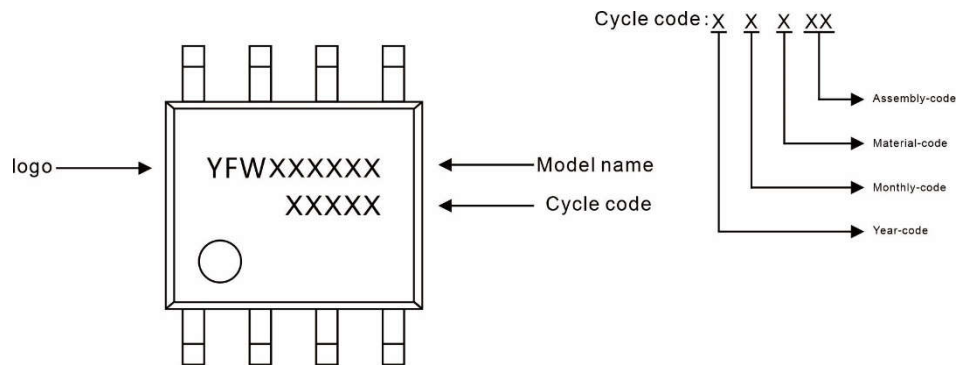


Figure 2 Switching Waveforms

Marking Diagram



Ordering information

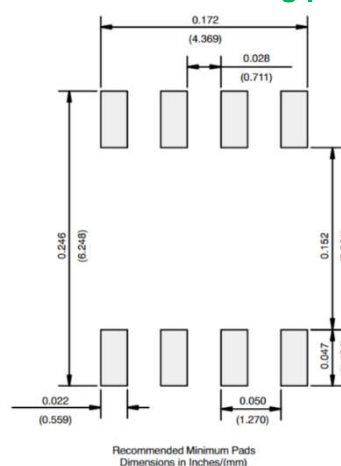
Package	Packing Description	Packing Quantity
SOP-8	Tape/Reel, 13" reel	3000PCS/Reel 30000PCS/Carton

Package Dimensions

SOP-8

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.35	1.50	0.053	0.059
b	0.35	0.55	0.014	0.022
c	0.15	0.25	0.006	0.010
D	4.80	5.00	0.189	0.197
D1	3.10	3.50	0.122	0.138
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
E2	2.20	2.60	0.087	0.102
e	1.27 (BSC)		0.050 (BSC)	
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

The recommended mounting pad size



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