Shenzhen Tuofeng Semiconductor Technology co., LTD

4409

P-Channel Enhancement-Mode MOSFET (-30V, -12A)

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (m-ohm) Max
-30V	-12A	12 @ V_{GS} = -10V ,ID=-12A
		15 @ V_{GS} = -4.5V ,ID=-10A

Features

- Advanced Trench Process Technology

- High Density Cell Design for Ultra Low On-Resistance

- Lead free product is acquired

SOP-8

Pin 1 / 2 / 3: Source
Pin 4: Gate
Pin 5 / 6 / 7 / 8: Drain
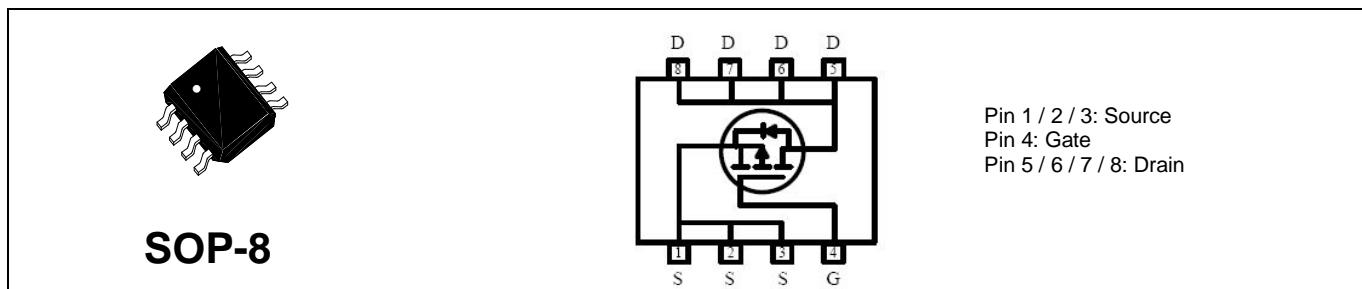
Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current @T_A=25°C	-12	A
I_{DM}	Drain Current (Pulsed) [a]	-60	A
I_{AR}	Avalanche Current	30	A
E_{AR}	Repetitive Avalanche Energy L=0.3mH	135	mJ
P_D	Total Power Dissipation @T_A=25°C	3	W
	Total Power Dissipation @T_A=75°C	2.1	
I_S	Maximum Diode Forward Current	-2.1	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	°C
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (PCB mounted)[b]	50	°C/W

a: Repetitive Rating: Pulse width limited by the maximum junction temperation.
b: 1-in^2 2oz Cu PCB board

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Electrical Characteristics (T$_A$=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=-250uA	-30	-	-	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=-24V, V$_{GS}$=0V	-	-	-1	uA
I$_{GSS}$	Gate-Body Leakage Current	V$_{GS}$=±25V, V$_{DS}$=0V	-	-	±100	nA
• On Characteristics[c]						
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=-250uA	-1.0	-	-3.0	V
I$_{DS(on)}$	On State Drain Current	V$_{DS}$=-5V, V$_{GS}$=-10V	60	-	-	A
R$_{DS(on)}$	Drain-Source On-State Resistance	V$_{GS}$=-10V, I$_D$=-12A	-	-	12	mΩ
		V$_{GS}$=-4.5V, I$_D$=-10A	-	-	10	
g$_{FS}$	Forward Transconductance	V$_{DS}$=-10V, I$_D$=-5A	-	26	-	S
• Dynamic Characteristics [d]						
C$_{iss}$	Input Capacitance	V$_{DS}$=-15V, V$_{GS}$=0V, f=1MHz	-	2076	2500	pF
C$_{oss}$	Output Capacitance		-	503	-	
C$_{rss}$	Reverse Transfer Capacitance		-	302	423	
R$_g$	Gate Resistance	V$_{DS}$=0V, V$_{GS}$=0V, f=1MHz	1	2	3	Ω
• Switching Characteristics[d]						
Q$_g$	Total Gate Charge	V$_{DS}$=-15V, I$_D$=-12A, V$_{GS}$=-10V	-	37.2	-	nC
Q$_{gs}$	Gate-Source Charge		-	7	-	
Q$_{gd}$	Gate-Drain Charge		-	10.4	-	
t$_{d(on)}$	Turn-on Delay Time	V$_{DD}$=-15V, R$_L$=1.25Ω, V$_{GS}$=-10V, R$_G$=3Ω	-	12.4	-	nS
t$_r$	Turn-on Rise Time		-	8.2	-	
t$_{d(off)}$	Turn-off Delay Time		-	25.6	-	
t$_f$	Turn-off Fall Time		-	12	-	
t$_{rr}$	Reverse Recovery Time	I$_{DS}$=-12A, dI/dt=100A/uS	-	33	40	nS
Q$_{rr}$	Reverse Recovery Charge		-	23	-	nC
• Drain-Source Diode Characteristics						
V$_{SD}$	Drain-Source Diode Forward Voltage	V$_{GS}$=0V, I$_S$=-1A	-	-	-1	V
I$_S$	Drain-Source Diode Forward Current		-	-	-4.2	A

Note: Pulse Test: Pulse Width ≤300us, Duty Cycle≤2%

## Characteristics Curve
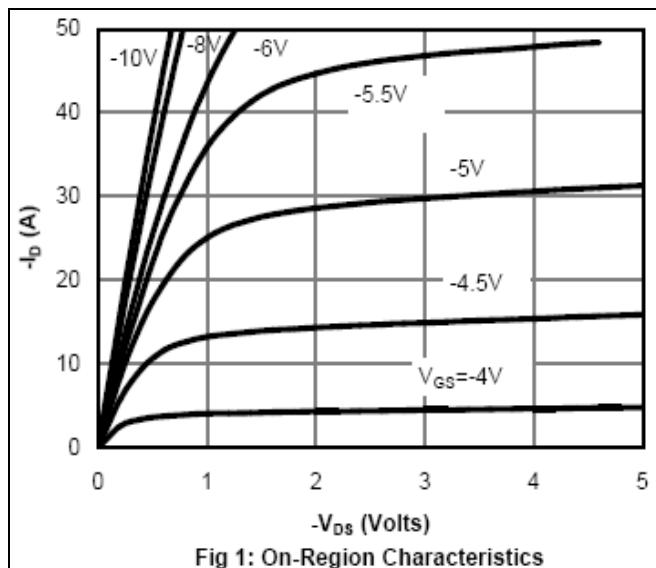
Fig 1: On-Region Characteristics
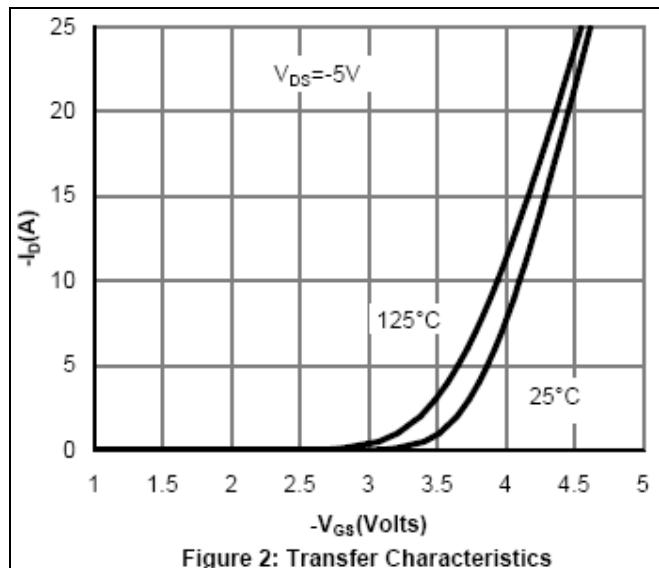
Figure 2: Transfer Characteristics
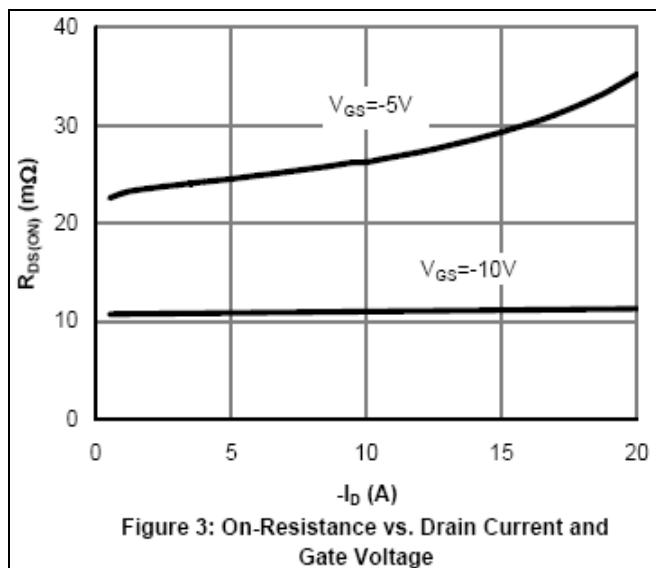
Figure 3: On-Resistance vs. Drain Current and Gate Voltage
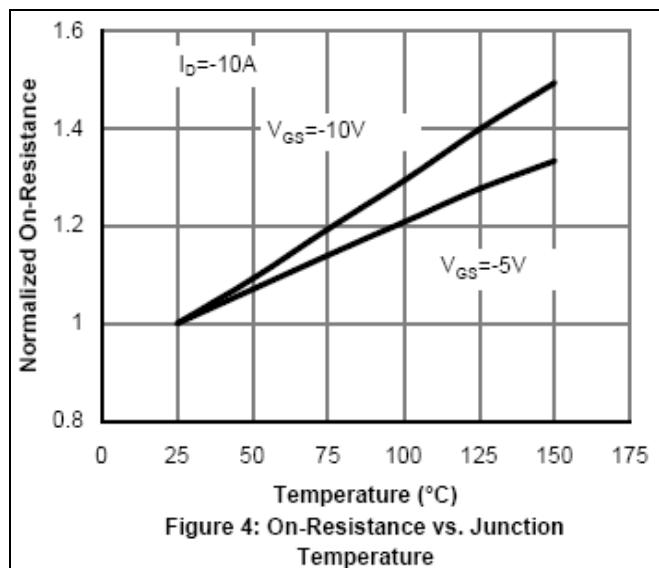

Figure 4: On-Resistance vs. Junction Temperature
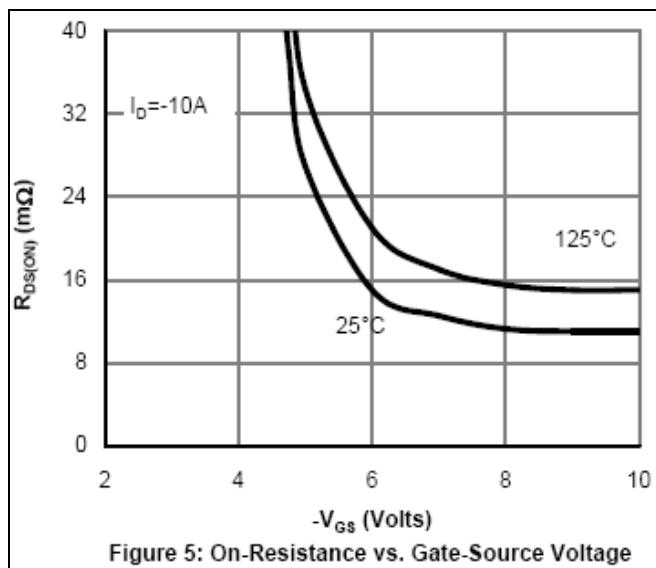

Figure 5: On-Resistance vs. Gate-Source Voltage
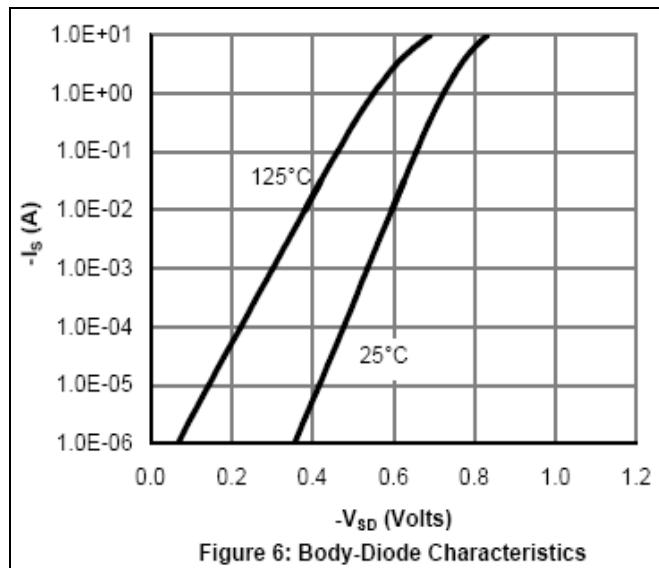
Figure 6: Body-Diode Characteristics

Characteristics Curve
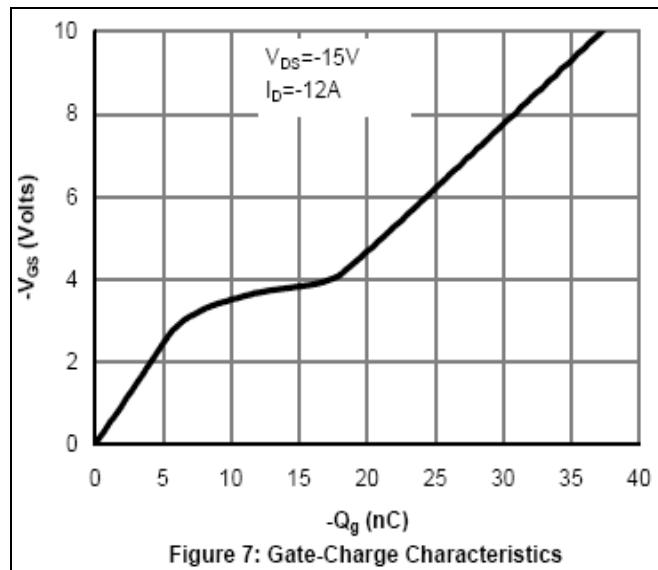
Figure 7: Gate-Charge Characteristics
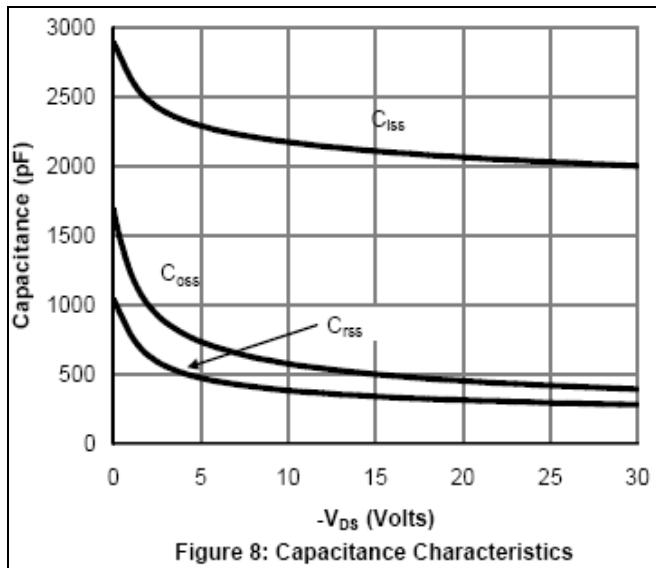
Figure 8: Capacitance Characteristics
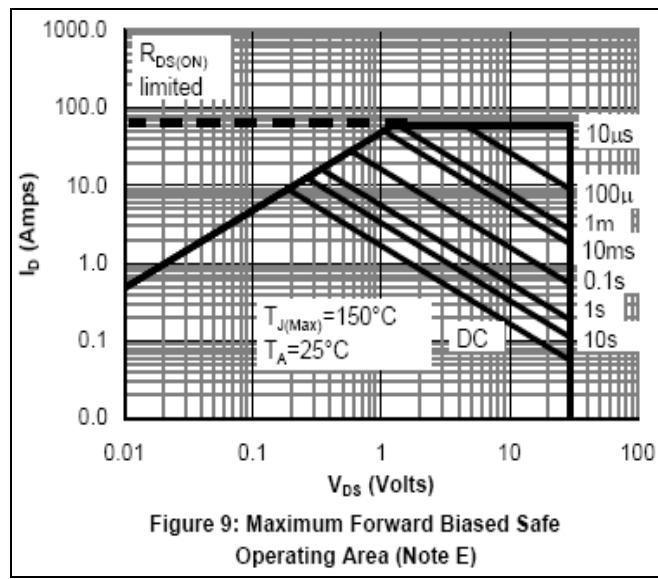
Figure 9: Maximum Forward Biased Safe Operating Area (Note E)
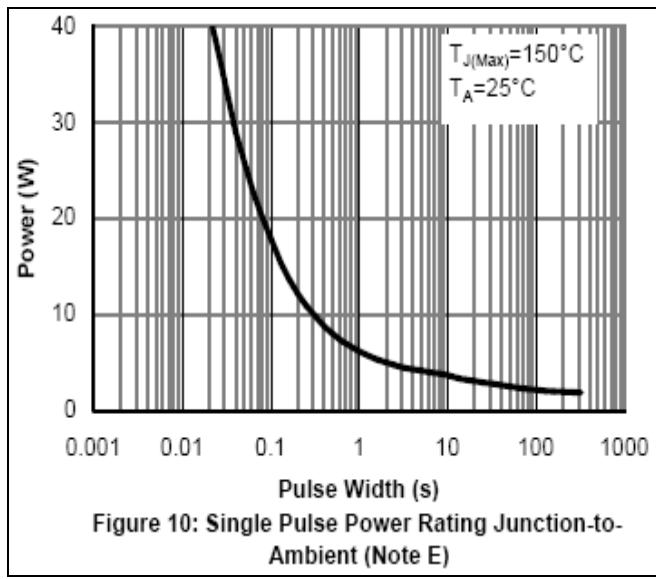
Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)
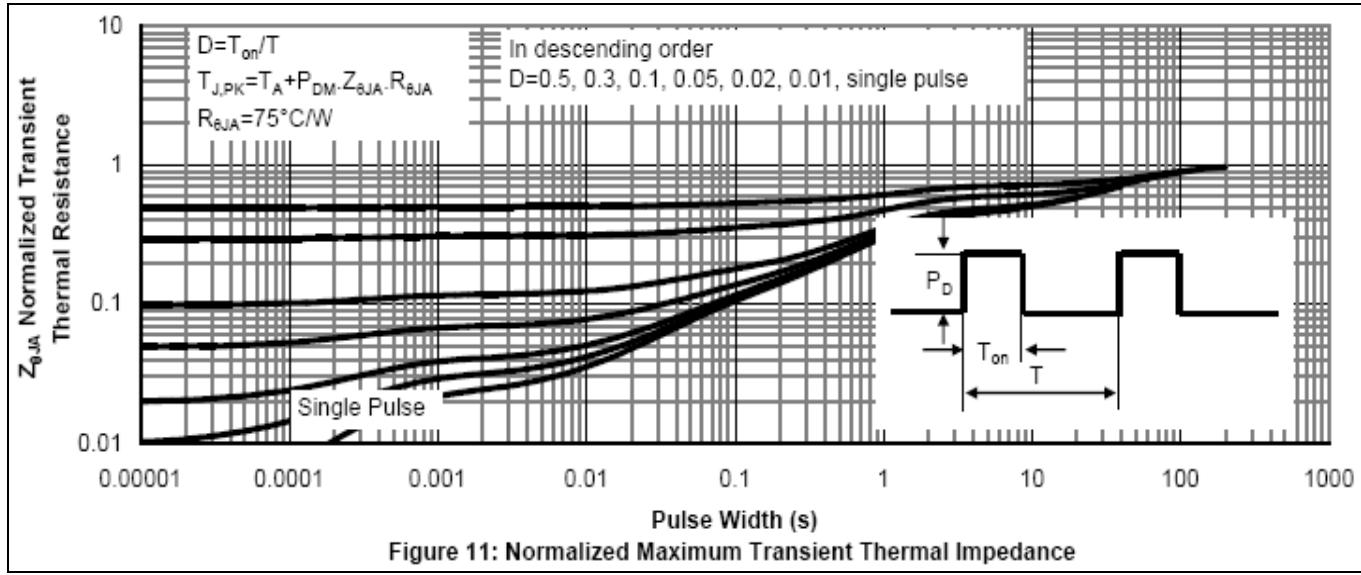
Figure 11: Normalized Maximum Transient Thermal Impedance