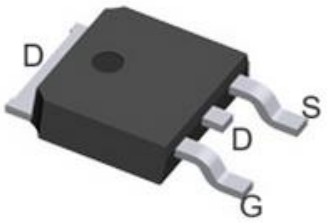
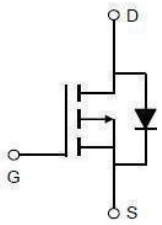
P-Channel Advanced Trench MOSFET

MSR15R6P06D

TO-252





Features

- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handing capability
- Lead free product is acquired

Applications

- Load Switch
- Server power
- SMPS 2nd Synchronous Rectifier
- BLDC Motor driver

Maximum ratings, at T_A =25°C, unless otherwise specified

Absolute Maximum Ratings

PARAMETERS/TEST CONDITIONS	SYMBOL	LIMITS	UNITS
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	-60	V
Drain Current –continuous @25ºC	I_D	-56	A
Drain Current –continuous @100ºC	I_D	-40	A
Pulsed Drain Current[1]	I_{DM}	-244	A
Gate-Source Voltag (V_{DS}=0V)	V_{GS}	±20	V
Single Pulse Avalanche[2]	E_{AS}	484	mJ
Operating Junction & Storage Temperature	T_j, T_{stg}	-55 to 150	°C

Note:

1. Pulse width limited by maximum junction temperature.
2. E_{AS} condition: TJ=25℃,V_{DD}=-40V,V_G=-10V, Rg=25Ω, L=0.5mH.

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-60V,V_{GS}=0V	--	--	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±20V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-1	-1.8	-2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-15A	--	12	15.6	mΩ
		V_{GS}=-4.5V, I_D=-10A	--	14.3	19	
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=-30V,V_{GS}=0 V , f=1MHz	--	8700	--	pF
C_{oss}	Output Capacitance		--	290	--	pF
C_{rss}	Reverse Transfer Capacitance		--	210	--	pF
Q_g	Total Gate Charge	V_{DS}=-10V,I_D=-20A , V_{GS}=-30V	--	140	--	nC
Q_{gs}	Gate-Source Charge		--	19	--	nC
Q_{gd}	Gate-Drain Charge		--	28	--	nC
Switching Characteristics						
$T_{d(on)}$	Turn-on Delay Time	V_{GS}=-10V,V_{DS}=-30V, R_L=1.5Ω,R_{GEN}=3Ω	--	26	--	ns
T_r	Turn-on Rise Time		--	21	--	ns
$T_{d(off)}$	Turn-Off Delay Time		--	138	--	ns
T_f	Turn-Off Fall Time		--	30	--	ns

Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)

I_{SD}	Source-Drain Current (Body Diode)		--	--	-56	A
V_{SD}	Forward Voltage	V_{GS} = 0V, I_{SD} = -20A	--	--	-1.2	V
T_{rr}	Reverse Recovery Time	I_F = -20 A, dI_F/dt = 100 A/μs	--	56	--	ns
Q_{rr}	Reverse Recovery Charge		--	63	--	nC

Typical Performance Characteristics

Figure 1. Output Characteristics

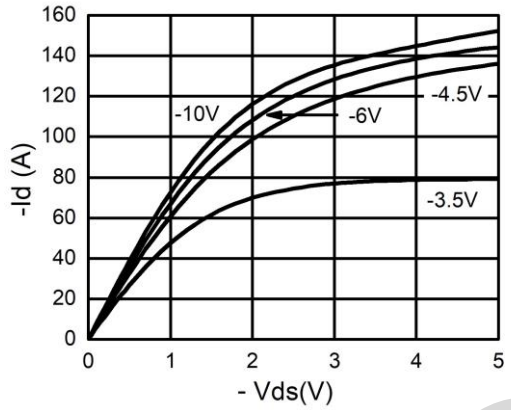


Figure 2. Transfer Characteristics

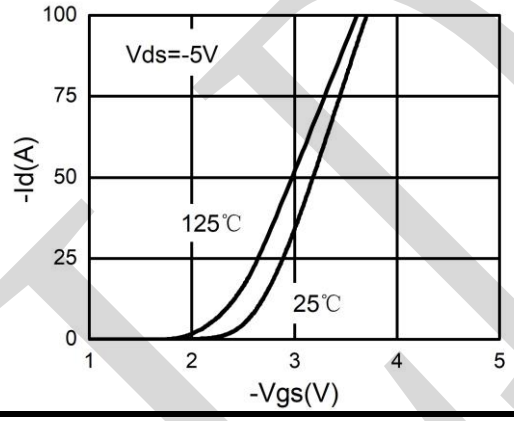


Figure 3. Power Dissipation

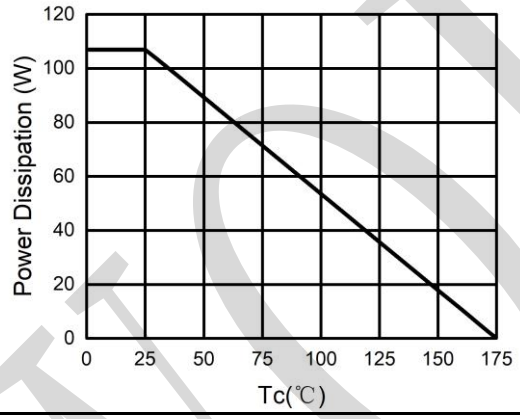


Figure 4. Drain Current

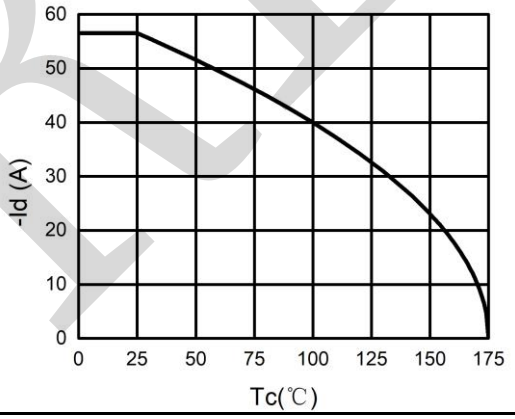


Figure 5. BV_{DSS} vs Junction Temperature

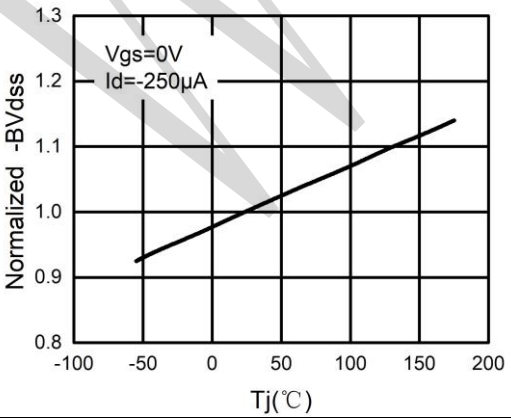
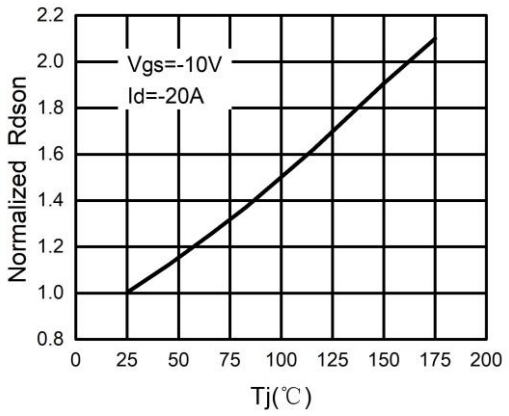


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



Typical Performance Characteristics

Figure 7. Gate Charge Waveforms

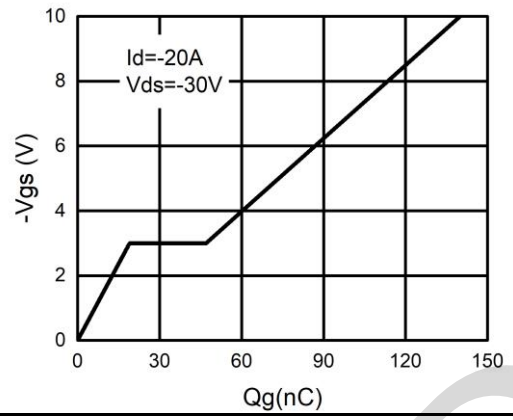


Figure 8. Capacitance

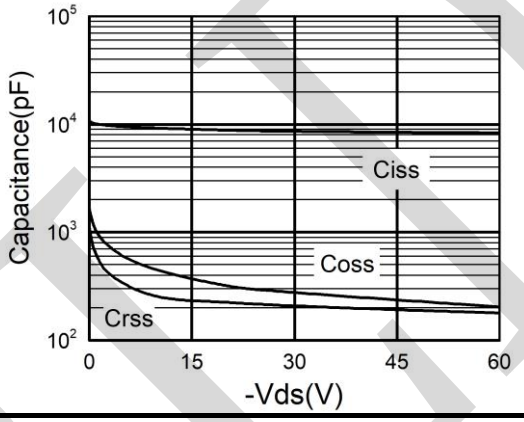


Figure 9. Body-Diode Characteristics

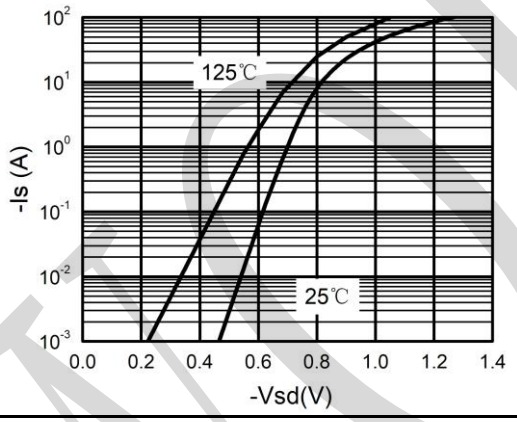
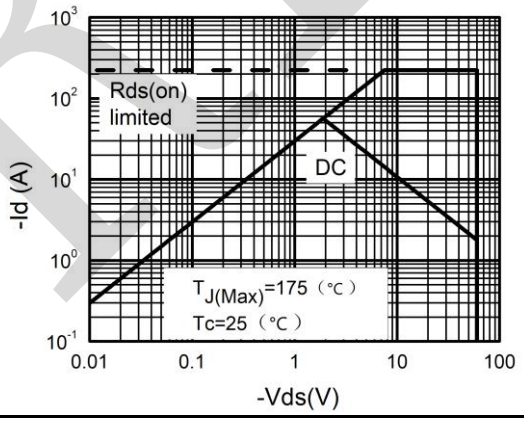
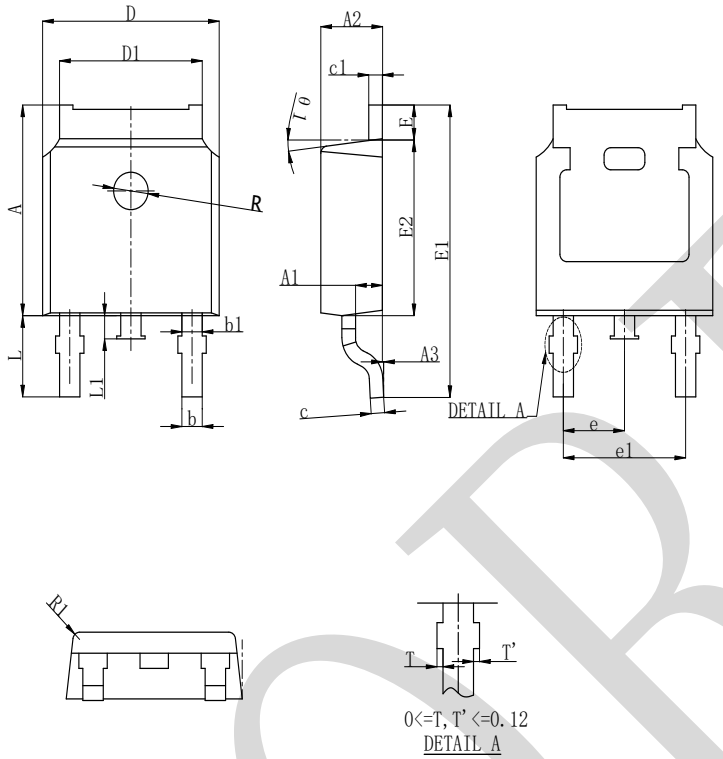


Figure 10. Maximum Safe Operating Area



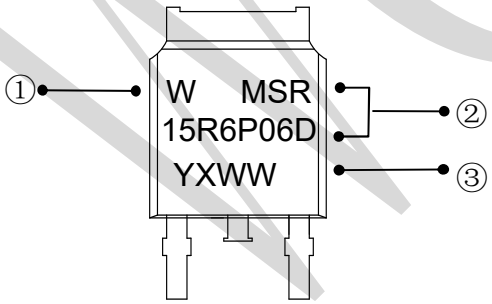
PACKAGE OUTLINE DIMENSIONS

TO-252



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	7.050	7.100	7.150
A1	0.960	1.010	1.060
A2	2.250	2.300	2.350
A3	0.000	0.050	0.100
b	0.760REF.		
b1	1.000REF.		
c	0.508REF.		
c1	0.508REF.		
D	6.550	6.600	6.650
D1	5.220	5.320	5.420
E	0.950	1.000	1.050
E1	9.700	9.900	10.100
E2	6.050	6.100	6.150
e	2.286BSC		
e1	4.572REF.		
L	2.650	2.800	2.950
L1	0.700	0.800	0.900
θ1	7° REF.		
R	1.300REF.		
R1	0.250REF.		

Marking Information



①W : Company's trademark

②Product model : MSR15R6P06D

③PDC information：