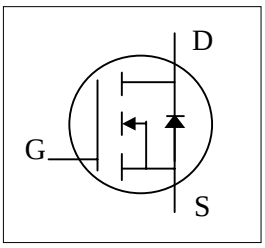
Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

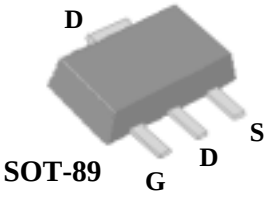
- ▼ **Lower gate charge**
- ▼ **Capable of 2.5V gate drive**
- ▼ **Single Drive Requirement**



BV_{DSS}	20V
$R_{DS(ON)}$	50mΩ
I_D	4A

Description

The Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, ruggedized device design, ultra low on-resistance and cost-effectiveness.



SOT-89

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±16	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 4.5V[3]	4	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 4.5V[3]	2.5	A
I_{DM}	Pulsed Drain Current[1]	12	A
P_D@T_C=25℃	Total Power Dissipation	1.25	W
	Linear Derating Factor	0.01	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter		Value	Unit
Rthj-a	Thermal Resistance Junction-ambient[3]	Max.	100	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	20	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=1mA	-	0.03	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=4A	-	-	38	mΩ
		V_{GS}=4.5V, I_D=4A	-	-	50	mΩ
		V_{GS}=2.5V, I_D=3A	-	-	80	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.7	-	1.5	V
g_{fs}	Forward Transconductance[2]	V_{DS}=5V, I_D=3A	-	10	-	S
I_{DSS}	Drain-Source Leakage Current (T_j=25°C)	V_{DS}=20V, V_{GS}=0V	-	-	1	uA
	Drain-Source Leakage Current (T_j=70°C)	V_{DS}=16V ,V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}= ±16V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=4A	-	6	10	nC
Q_{gs}	Gate-Source Charge	V_{DS}=16V	-	1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	2	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=10V	-	8	-	ns
t_r	Rise Time	I_D=1A	-	9	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω,V_{GS}=5V	-	13	-	ns
t_f	Fall Time	R_D=10Ω	-	3	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	360	570	pF
C_{oss}	Output Capacitance	V_{DS}=20V	-	80	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	65	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=1A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_S=4A, V_{GS}=0V,	-	18	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	10	-	nC

Notes:

1.Pulse width limited by safe operating area.

2.Pulse width ≤300us , duty cycle ≤2%.

3.Surface mount on FR4 board, t ≤ 10s.

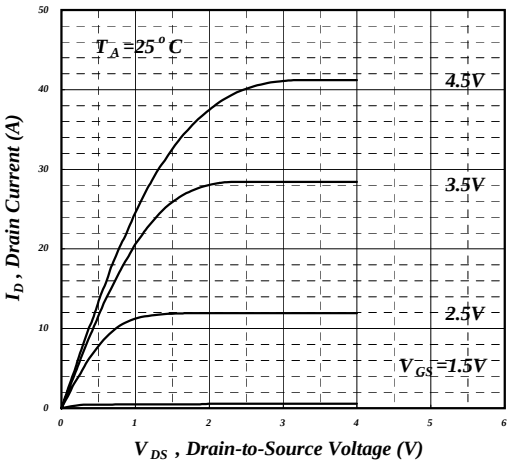


Fig 1. Typical Output Characteristics

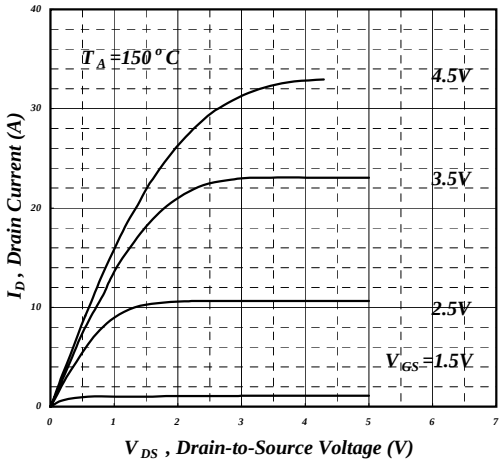


Fig 2. Typical Output Characteristics

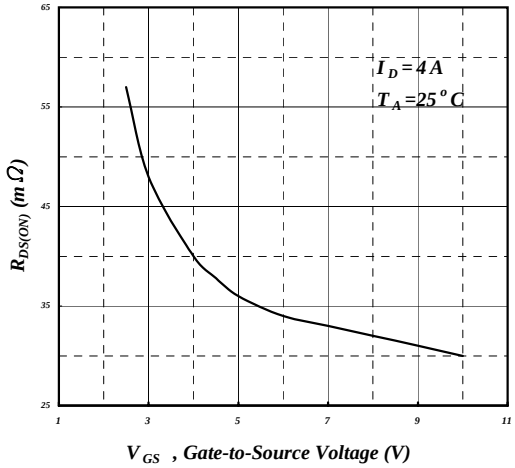


Fig 3. On-Resistance v.s. Gate Voltage

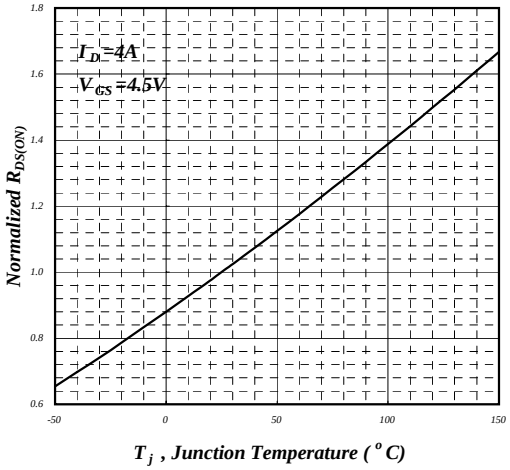


Fig 4. Normalized On-Resistance v.s. Junction Temperature

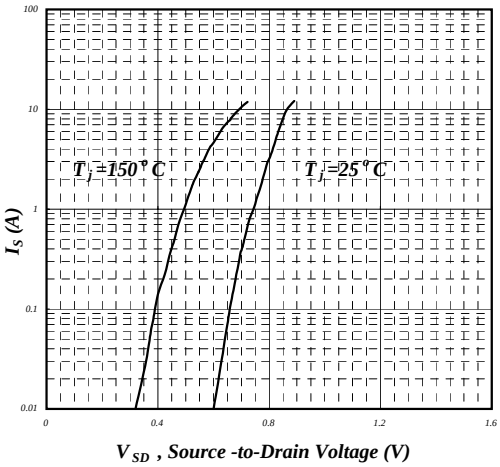


Fig 5. Forward Characteristic of Reverse Diode

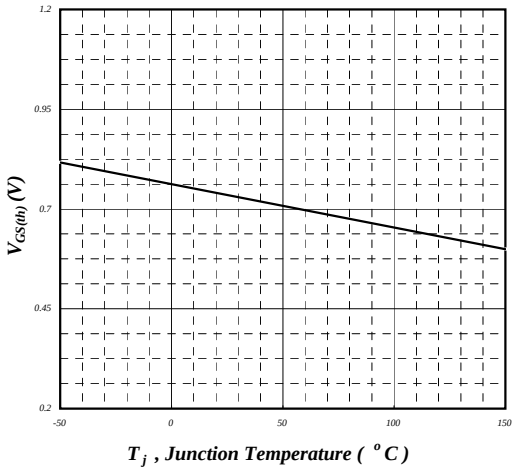


Fig 6. Gate Threshold Voltage v.s. Junction Temperature