



**Advanced Power
Electronics Corp.**

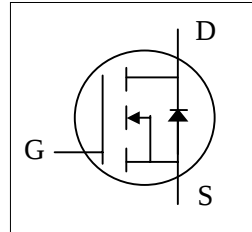
IRF840

RoHS-compliant Product

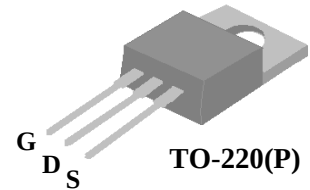
N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

- ▼ Ease of Paralleling
- ▼ Fast Switching Characteristic
- ▼ Simple Drive Requirement



BV_{DSS}	500V
$R_{DS(ON)}$	0.85 Ω
I_D	8A



Description

APEC MOSFET provide the power designer with the best combination of fast switching , lower on-resistance and reasonable cost.

The TO-220 and package is universally preferred for all commercial-industrial applications. The device is suited for switch mode power supplies ,DC-AC converters and high current high speed switching circuits.

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	8	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	5.1	A
I_{DM}	Pulsed Drain Current ¹	32	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	125	W
	Linear Derating Factor	1	W/ $^{\circ}C$
E_{AS}	Single Pulse Avalanche Energy ²	320	mJ
I_{AR}	Avalanche Current	8	A
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Thermal Resistance Junction-case	Max. 1.0	$^{\circ}C/W$
Rthj-a	Thermal Resistance Junction-ambient	Max. 62	$^{\circ}C/W$


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 =1mA	500	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =4.8A	-	-	0.85	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =4.8A	-	4.2	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =500V, V _{GS} =0V	-	-	25	uA
	Drain-Source Leakage Current (T _j =125°C)	V _{DS} =400V, V _{GS} =0V	-	-	250	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V	-	-	±100	nA
Q _g	Total Gate Charge ³	I _D =8A	-	45	72	nC
Q _{gs}	Gate-Source Charge	V _{DS} =400V	-	7	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	25	-	nC
t _{d(on)}	Turn-on Delay Time ³	V _{DD} =250V	-	12	-	ns
t _r	Rise Time	I _D =8A	-	31	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =9.1 Ω, V _{GS} =10V	-	48	-	ns
t _f	Fall Time	R _D =31 Ω	-	33	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1250	2000	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	270	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	85	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1.6	2.4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ³	T _j =25°C, I _S =8A, V _{GS} =0V	-	-	1.5	V
t _{rr}	Reverse Recovery Time ³	I _S =8A, V _{GS} =0V,	-	515	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	8.6	-	uC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Starting T_j=25°C, V_{DD}=50V, L=10mH, R_G=25 Ω
- 3.Pulse test

THIS PRODUCT IS ELECTROSTATIC SENSITIVE, PLEASE HANDLE WITH CAUTION.

THIS PRODUCT HAS BEEN QUALIFIED FOR USE IN CONSUMER APPLICATIONS. APPLICATIONS OR USE IN LIFE SUPPORT OR OTHER SIMILAR MISSION-CRITICAL DEVICES OR SYSTEMS ARE NOT AUTHORIZED.

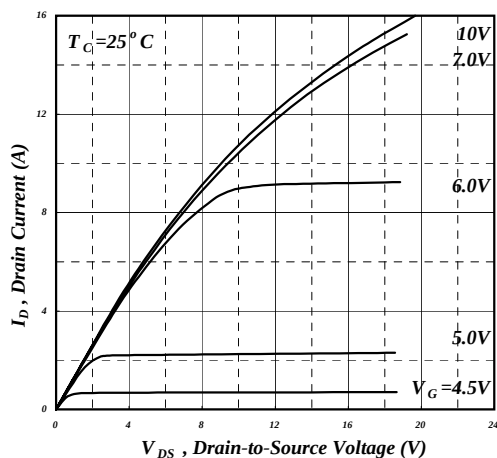


Fig 1. Typical Output Characteristics

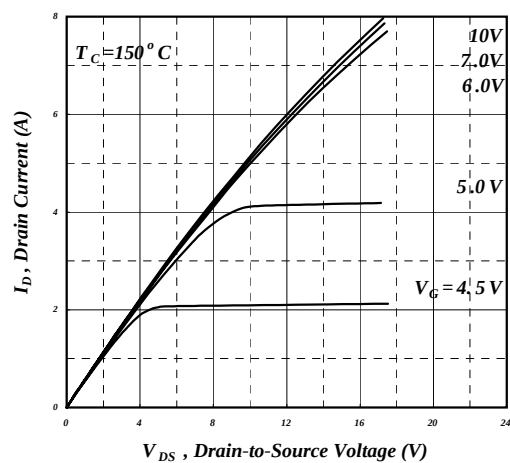


Fig 2. Typical Output Characteristics

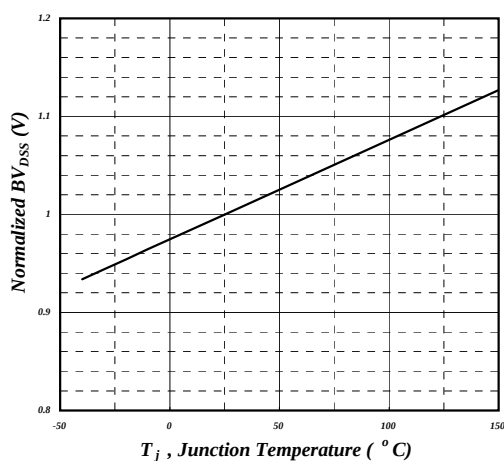
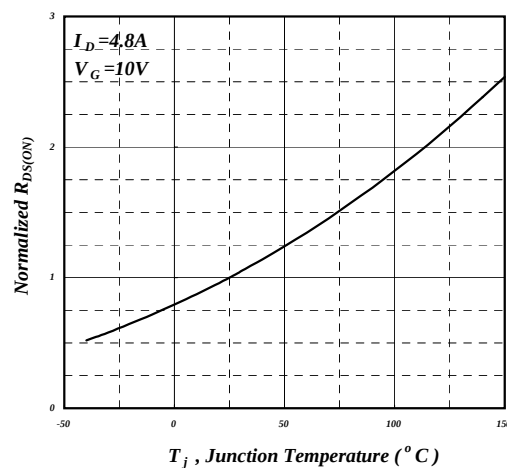
Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

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

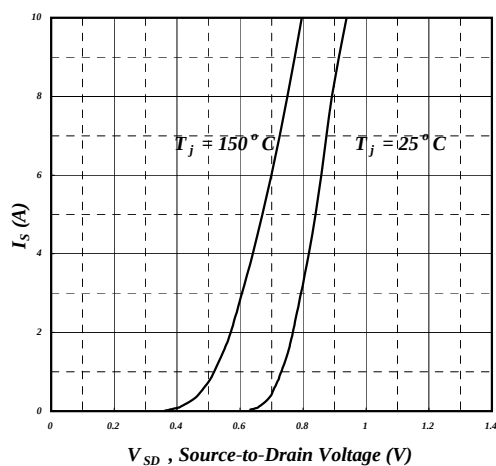


Fig 5. Forward Characteristic of Reverse Diode

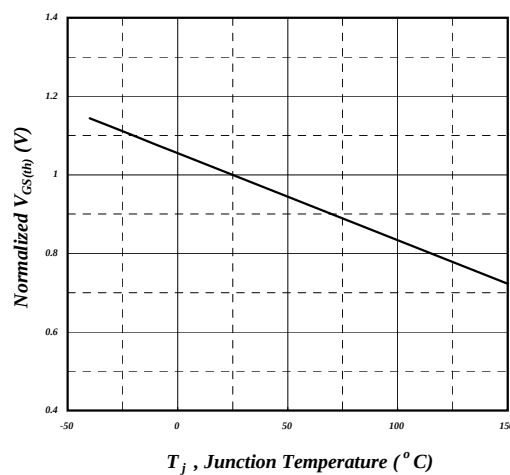


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

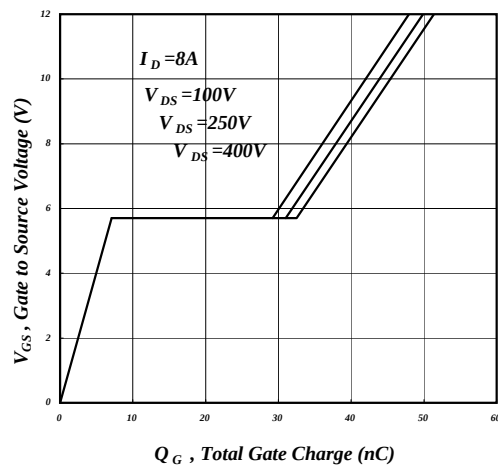


Fig 7. Gate Charge Characteristics

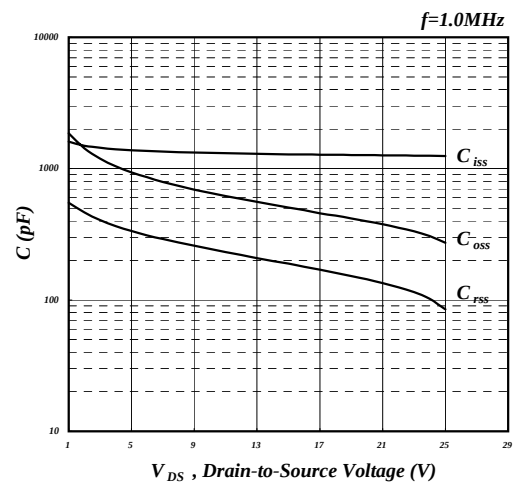


Fig 8. Typical Capacitance Characteristics

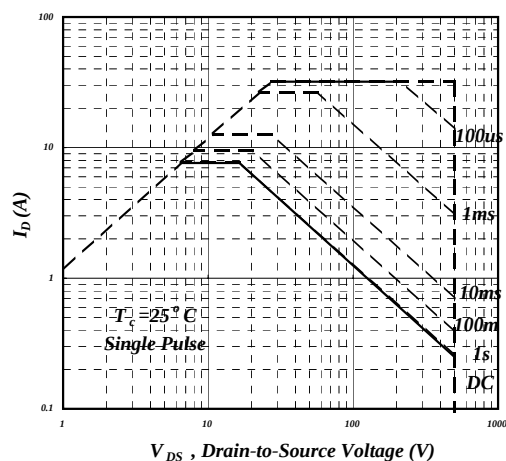


Fig 9. Maximum Safe Operating Area

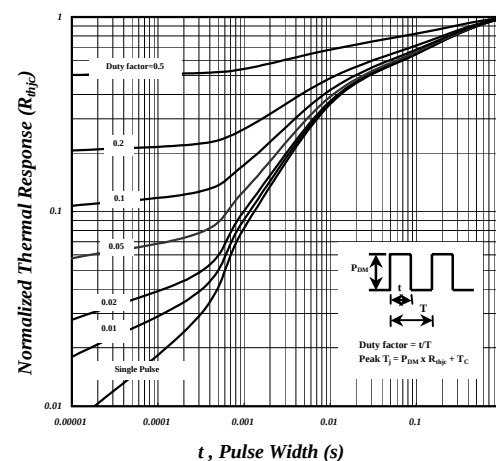


Fig 10. Effective Transient Thermal Impedance

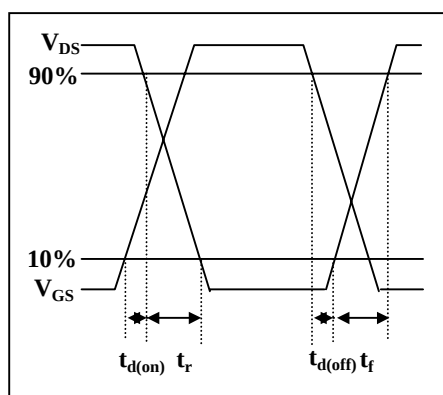


Fig 11. Switching Time Waveform

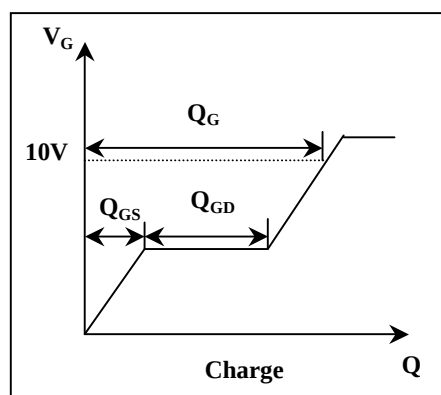


Fig 12. Gate Charge Waveform