



**Advanced Power
Electronics Corp.**

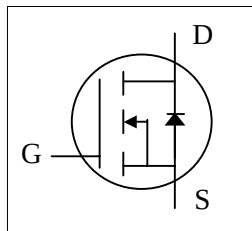
IRF840S

RoHS-compliant Product

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

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

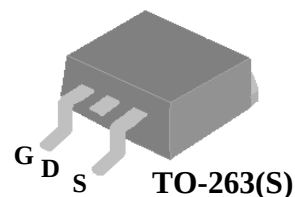


BV_{DSS}	500V
$R_{DS(ON)}$	$0.85\ \Omega$
I_D	8A

Description

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

The TO-263 package is widely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



Absolute Maximum Ratings

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

Thermal Data

Symbol	Parameter	Value	Unit
R_{thj-c}	Maximum Thermal Resistance, Junction-case	1.0	$^\circ\text{C}/\text{W}$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient	40	$^\circ\text{C}/\text{W}$



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	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	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, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge ³	I _D =8A V _{DS} =400V V _{GS} =10V	-	45	72	nC
Q _{gs}	Gate-Source Charge		-	7	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge		-	25	-	nC
t _{d(on)}	Turn-on Delay Time ³	V _{DD} =250V I _D =8A R _G =9.1 Ω, V _{GS} =10V R _D =31 Ω	-	12	-	ns
t _r	Rise Time		-	31	-	ns
t _{d(off)}	Turn-off Delay Time		-	48	-	ns
t _f	Fall Time		-	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, dI/dt=100A/μs	-	515	-	ns
Q _{rr}	Reverse Recovery Charge		-	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 SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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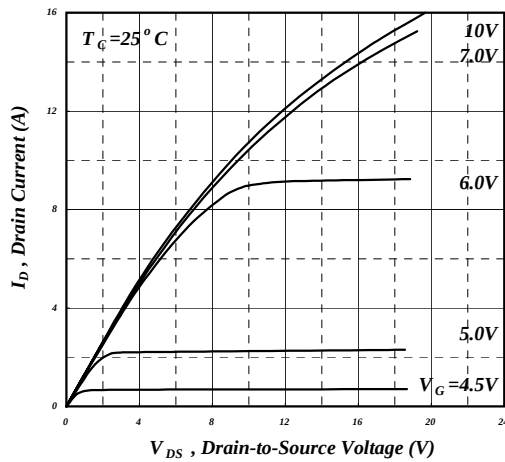


Fig 1. Typical Output Characteristics

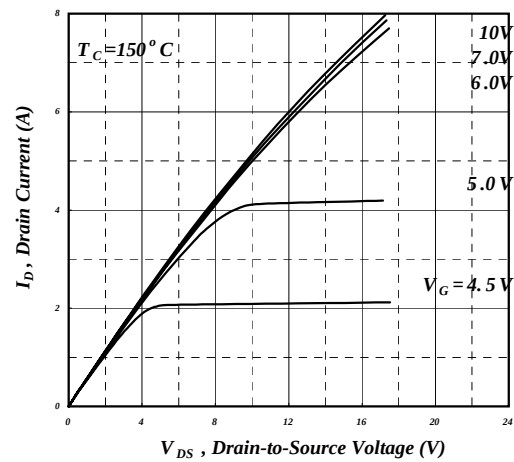


Fig 2. Typical Output Characteristics

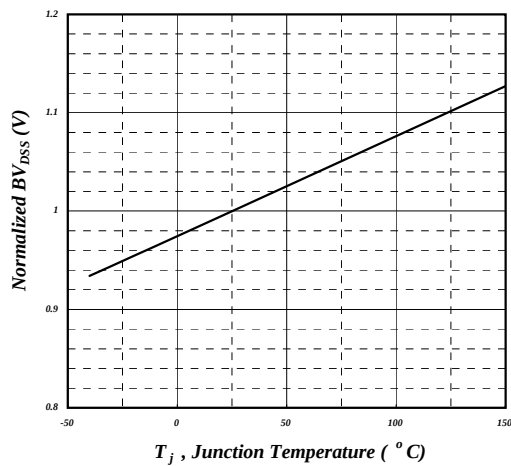


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

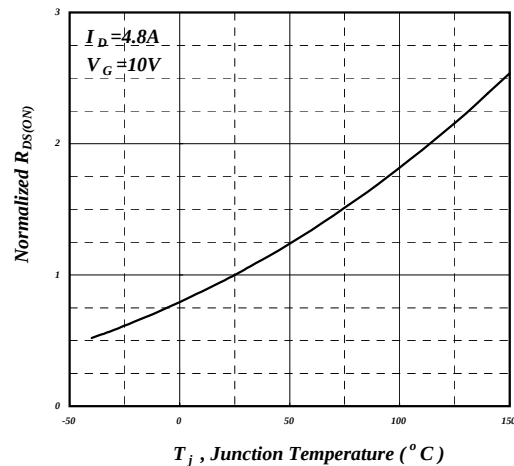


Fig 4. Normalized On-Resistance v.s. Junction Temperature

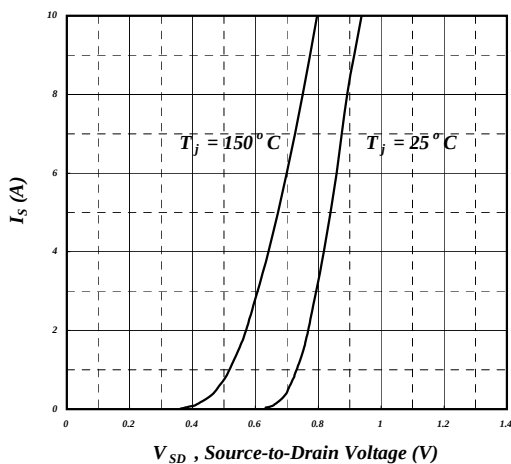


Fig 5. Forward Characteristic of Reverse Diode

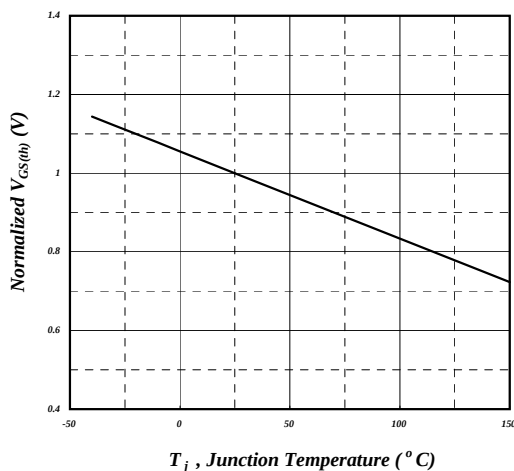


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

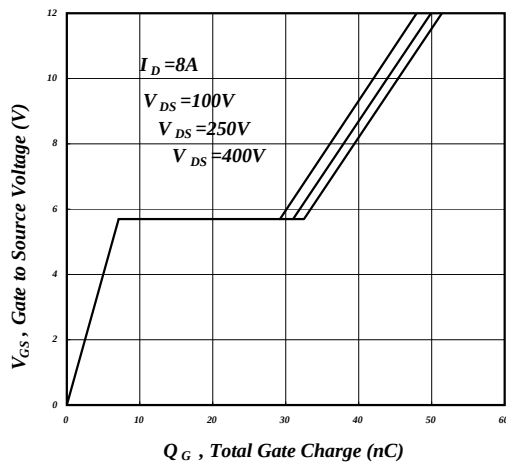


Fig 7. Gate Charge Characteristics

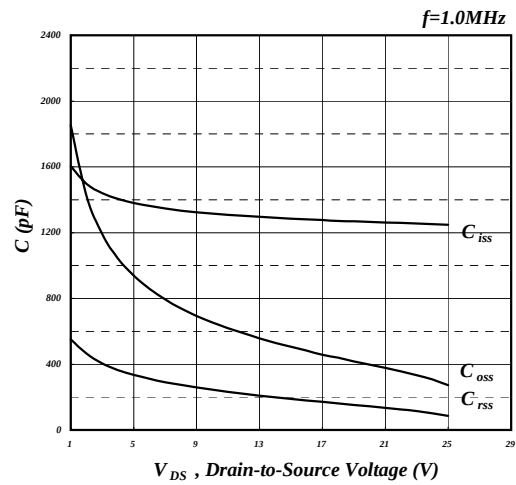


Fig 8. Typical Capacitance Characteristics

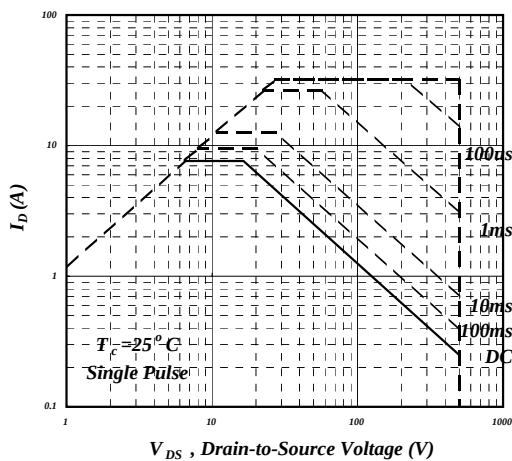


Fig 9. Maximum Safe Operating Area

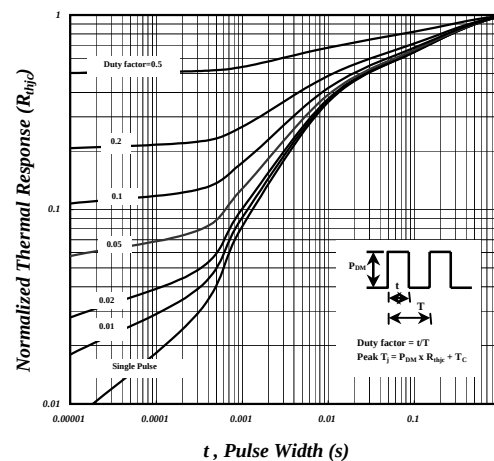


Fig 10. Effective Transient Thermal Impedance

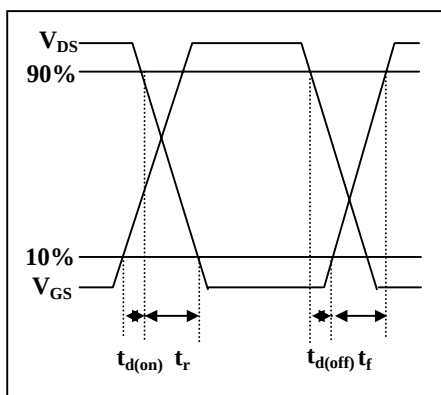


Fig 11. Switching Time Waveform

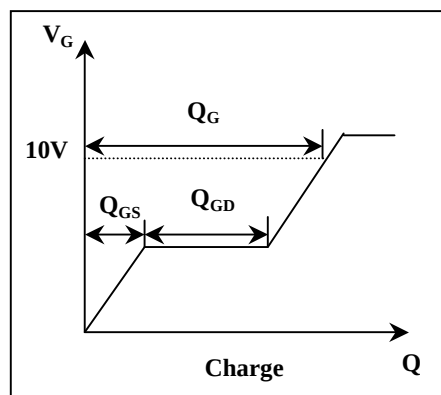


Fig 12. Gate Charge Waveform