Preliminary

Advanced Power Electronics Corp.

DUAL N-CHANNEL ENHANCEMENT MODE POWER MOSFET

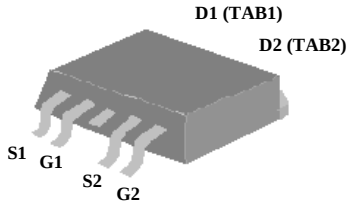
- ▼ **Simple Drive Requirement**
- ▼ **Fast Switching Performance**
- ▼ **Two Independent Device**
- ▼ **Halogen Free & RoHS Compliant Product**

BV_{DSS}	40V
$R_{DS(ON)}$	13mΩ
I_D	37A

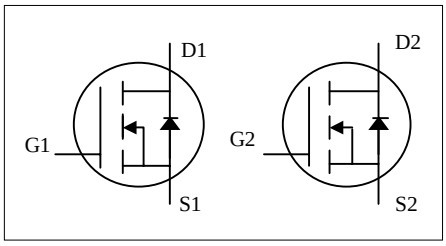
Description

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.

SDPAK™ used APEC innovated package and provides two independent device that is suitable and optimum for DC/DC power application.



SDPAK™



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	37	A
I_D@T_A=25℃	Continuous Drain Current[3]	11.5	A
I_D@T_A=70℃	Continuous Drain Current[3]	9.2	A
I_{DM}	Pulsed Drain Current[1]	50	A
P_D@T_A=25℃	Total Power Dissipation	3	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-c	Maximum Thermal Resistance, Junction-case	4.0	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	42	℃/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	40	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=10A	-	-	13	mΩ
		V_{GS}=4.5V, I_D=7A	-	-	22	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=10A	-	21	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=40V, V_{GS}=0V	-	-	10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=10A	-	9.5	15	nC
Q_{gs}	Gate-Source Charge	V_{DS}=32V	-	2	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	6	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=20V	-	7	-	ns
t_r	Rise Time	I_D=10A	-	21	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω,V_{GS}=10V	-	18	-	ns
t_f	Fall Time	R_D=2Ω	-	5.5	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	640	1020	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	140	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	80	-	pF
R_g	Gate Resistance	f=1.0MHz	-	2	3	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=2.5A, V_{GS}=0V	-	-	1.2	V
t_{rr}	Reverse Recovery Time[2]	Is=10A, V_{GS}=0V,	-	25	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	22	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Rthja is determined with the device, mounted on 2oz FR4 board t ≦10s.

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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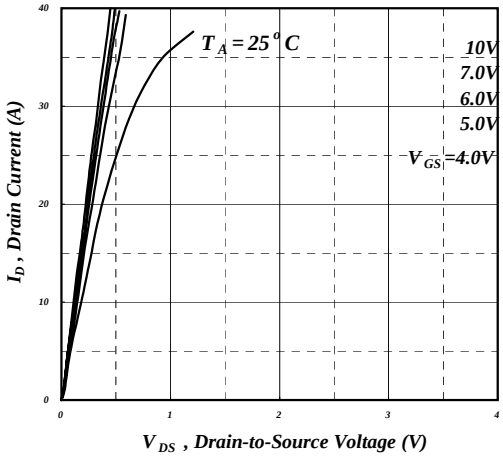


Fig 1. Typical Output Characteristics

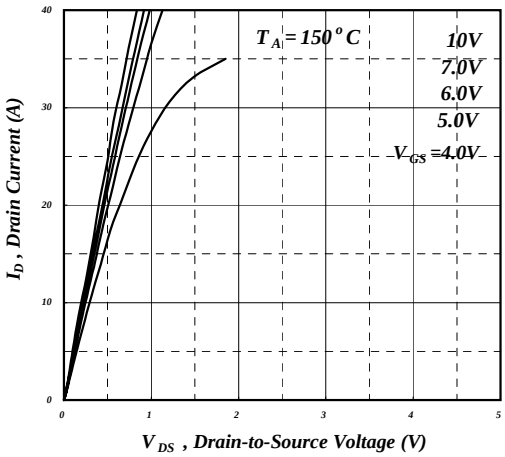


Fig 2. Typical Output Characteristics

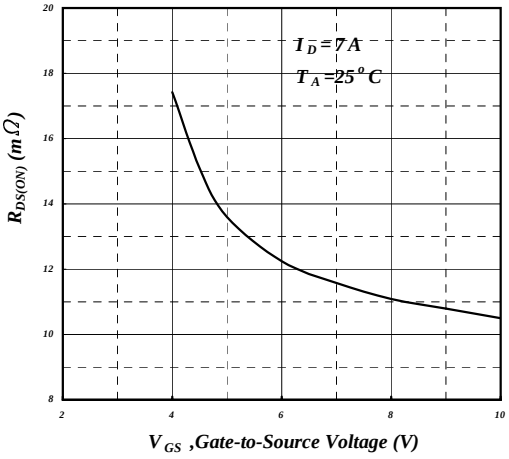


Fig 3. On-Resistance v.s. Gate Voltage

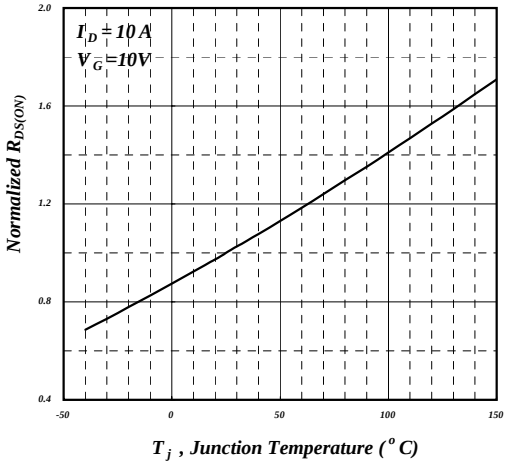


Fig 4. Normalized On-Resistance v.s. Junction Temperature

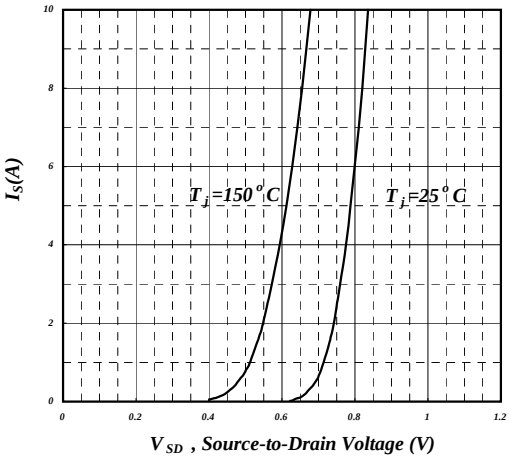


Fig 5. Forward Characteristic of Reverse Diode

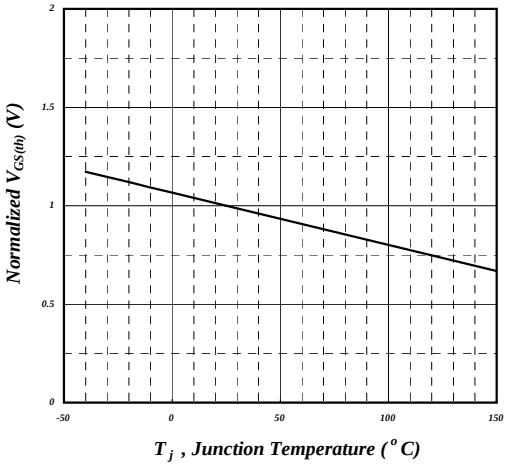


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

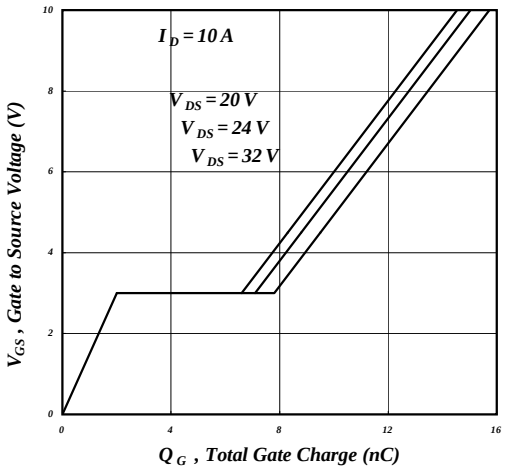


Fig 7. Gate Charge Characteristics

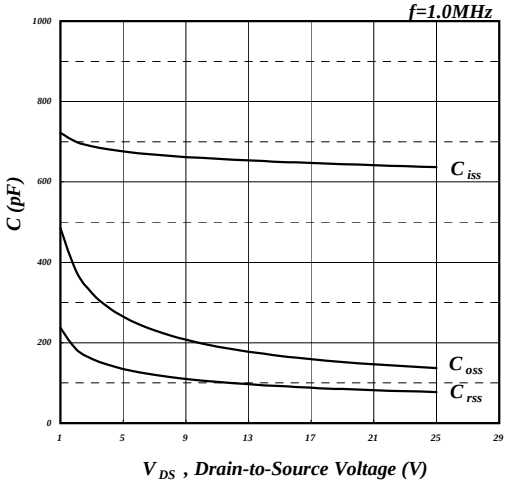


Fig 8. Typical Capacitance Characteristics

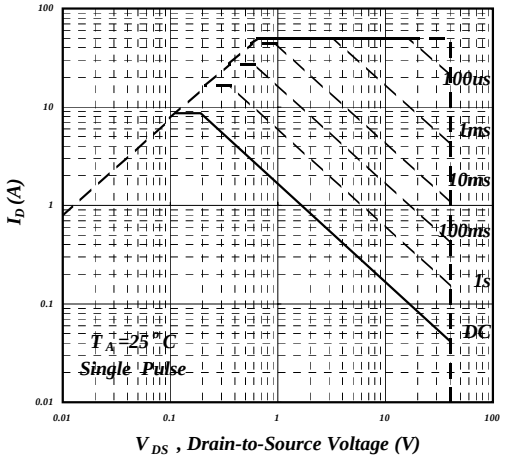


Fig 9. Maximum Safe Operating Area

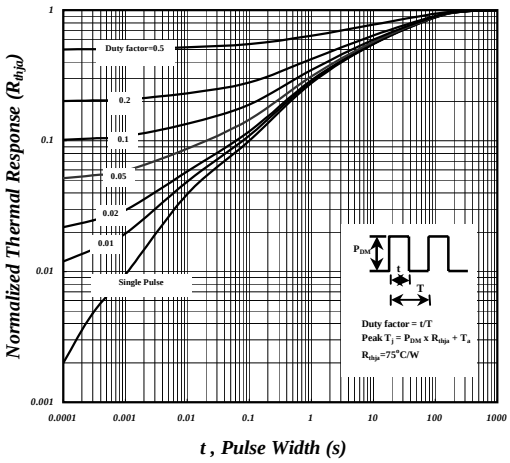


Fig 10. Effective Transient Thermal Impedance

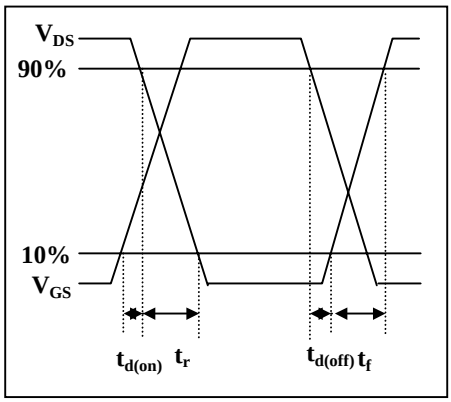


Fig 11. Switching Time Waveform

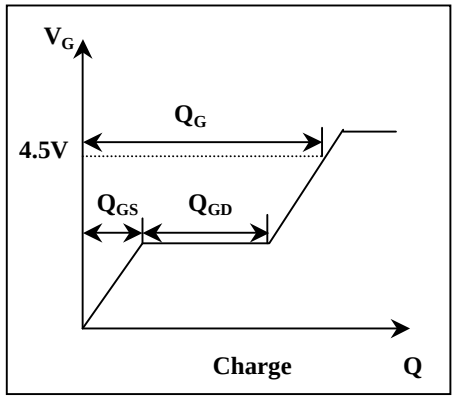


Fig 12. Gate Charge Waveform