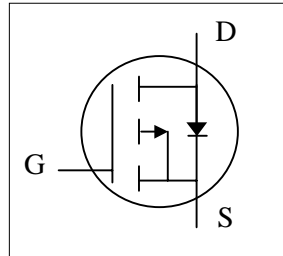




- ▼ Simple Drive Requirement
- ▼ Through Hole Type
- ▼ RoHS Compliant & Halogen-Free

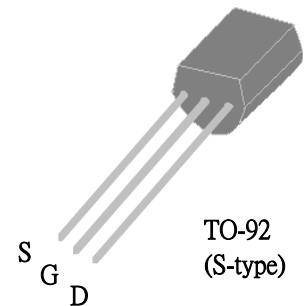


$BV_{DSS}$	-60V
$R_{DS(ON)}$	500m $\Omega$
$I_D$	-1.5A

### Description

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

The TO-92 package is widely used for all commercial-industrial applications.



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_L=25^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V	-1.5	A
$I_D@T_L=100^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V	-1.2	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	-6	A
$P_D@T_L=25^\circ C$	Total Power Dissipation	2.08	W
$P_D@T_A=25^\circ C$	Total Power Dissipation	0.83	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

### Thermal Data

Symbol	Parameter	Value	Units
Rthj-l	Maximum Thermal Resistance, Junction-lead	60	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	150	$^\circ C/W$



# AP9770GT-HF

## Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-60	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-0.8A	-	-	500	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.6A	-	-	800	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1	-	-3	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-0.8A	-	3.3	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V	-	-	-10	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V	-	-	+100	nA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =-1A	-	6.8	11	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-48V	-	1.6	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =-4.5V	-	3.2	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =-30V	-	8.4	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =-1A	-	5.4	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =-10V	-	23	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =30Ω	-	5	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	560	900	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =-25V	-	60	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	45	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	6.5	-	Ω

## Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =-0.6A, V <sub>GS</sub> =0V	-	-	-1.3	V
t <sub>rr</sub>	Reverse Recovery Time <sup>2</sup>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V,	-	30	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI/dt=-100A/μs	-	42	-	nC

### Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.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.

APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

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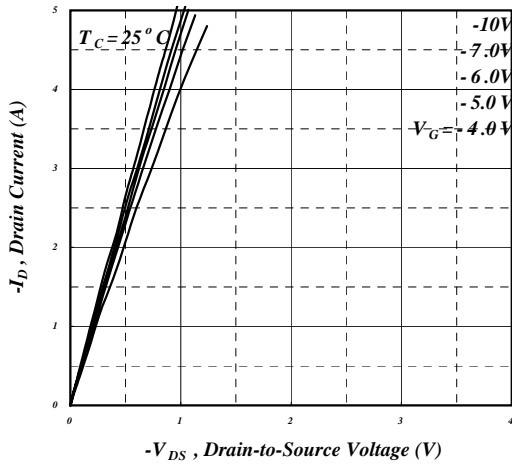


Fig 1. Typical Output Characteristics

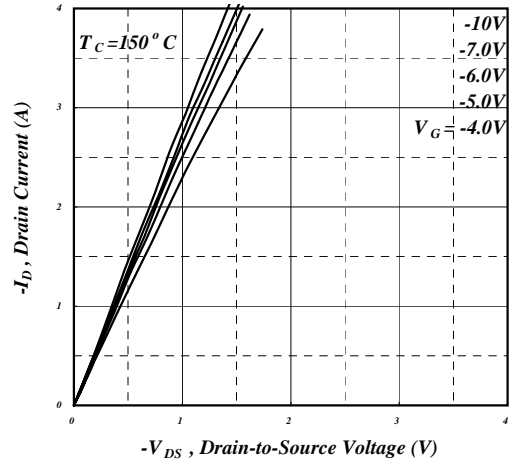


Fig 2. Typical Output Characteristics

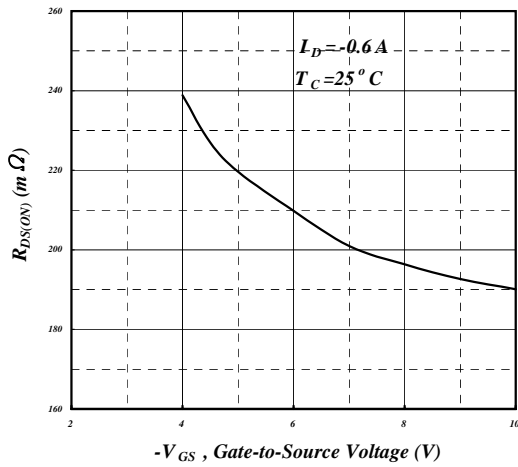


Fig 3. On-Resistance v.s. Gate Voltage

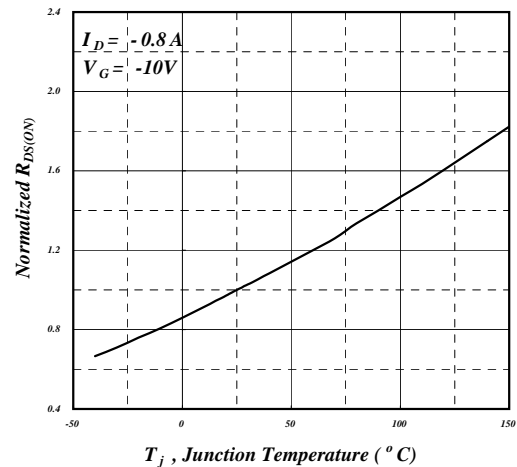


Fig 4. Normalized On-Resistance v.s. Junction Temperature

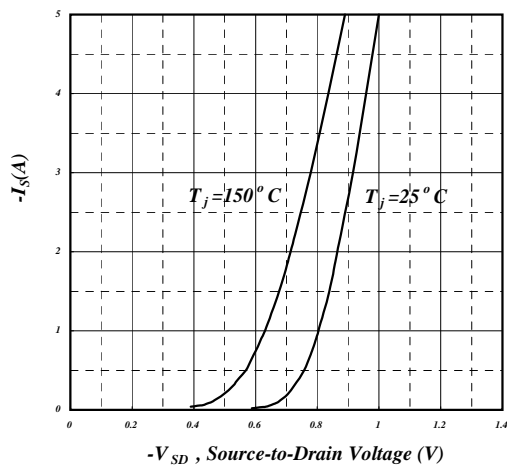


Fig 5. Forward Characteristic of Reverse Diode

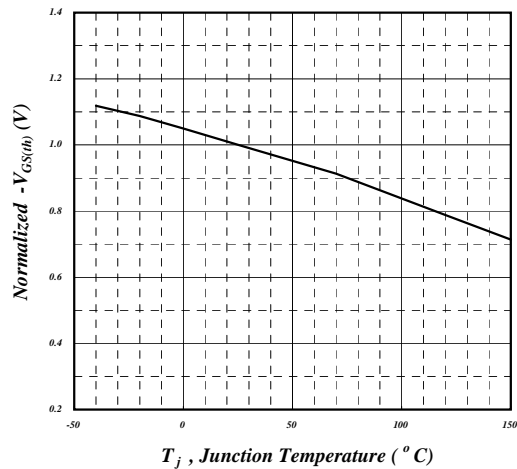


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

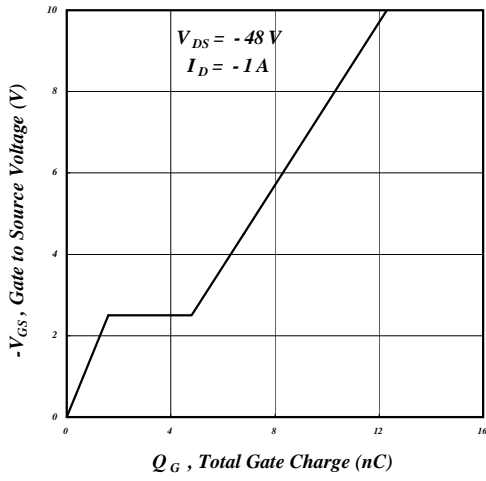


Fig 7. Gate Charge Characteristics

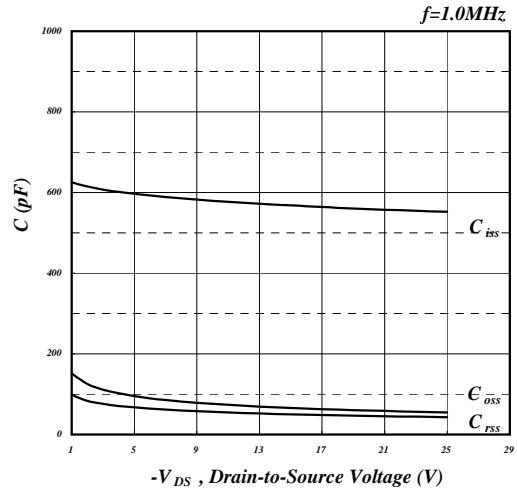


Fig 8. Typical Capacitance Characteristics

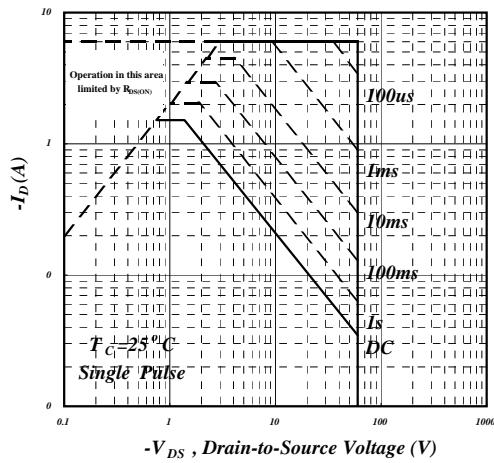


Fig 9. Maximum Safe Operating Area

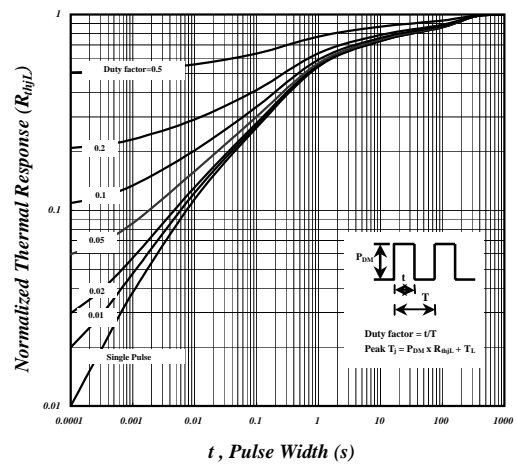


Fig 10. Effective Transient Thermal Impedance



Fig 11. Switching Time Waveform

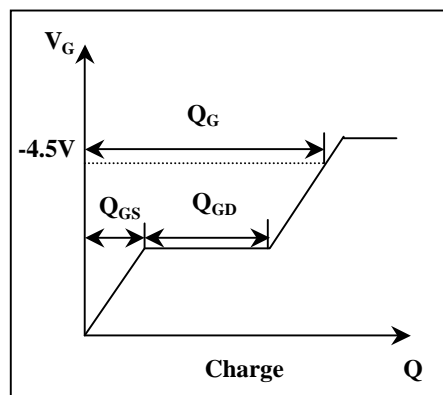


Fig 12. Gate Charge Waveform