AP2533GY-HF

Advanced Power Electronics Corp.
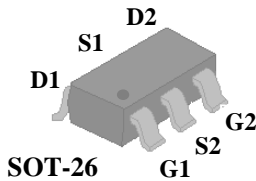
N AND P-CHANNEL ENHANCEMENT

MODE POWER MOSFET

▼ Low Gate Charge
▼ Fast Switching Performance
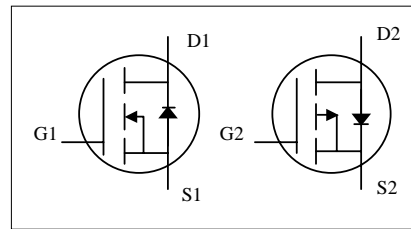▼ Surface Mount Package
▼ RoHS Compliant & Halogen-Free

SOT-26

N-CH	BV_{DSS}	16V
	$R_{DS(ON)}$	150mΩ
	I_D	2.2A
P-CH	BV_{DSS}	-16V
	$R_{DS(ON)}$	320mΩ
	I_D	-1.5A

Description

Advanced Power MOSFETs utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The SOT-26 package is widely used for commercial surface mount applications.

Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		N-channel	P-channel	
V_{DS}	Drain-Source Voltage	16	-16	V
V_{GS}	Gate-Source Voltage	± 8	± 8	V
I_D@T_A=25℃	Continuous Drain Current[3]	2.2	-1.5	A
I_D@T_A=70℃	Continuous Drain Current[3]	1.8	-1.2	A
I_{DM}	Pulsed Drain Current[1]	8.0	-6.0	A
P_D@T_A=25℃	Total Power Dissipation	1.14		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	Maximum Thermal Resistance, Junction-ambient[3]	110	℃/W

Data and specifications subject to change without notice

1

201008171

AP2533GY-HF

N-CH 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	16	-	-	V
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=4.5V, I$_D$=2A	-	-	150	mΩ
		V$_{GS}$=2.5V, I$_D$=1.5A	-	-	230	mΩ
		V$_{GS}$=1.8V, I$_D$=0.5A	-	-	450	mΩ
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250uA	0.2	-	1	V
g$_{fs}$	Forward Transconductance	V$_{DS}$=5V, I$_D$=2A	-	8	-	S
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=12V, V$_{GS}$=0V	-	-	1	uA
I$_{GSS}$	Gate-Source Leakage	V$_{GS}$=$\pm$8V, V$_{DS}$=0V	-	-	$\pm$100	nA
Q$_g$	Total Gate Charge[2]	I$_D$=2A	-	6.5	10.4	nC
Q$_{gs}$	Gate-Source Charge	V$_{DS}$=10V	-	0.5	-	nC
Q$_{gd}$	Gate-Drain ("Miller") Charge	V$_{GS}$=4.5V	-	1.5	-	nC
t$_{d(on)}$	Turn-on Delay Time[2]	V$_{DS}$=10V	-	8	-	ns
t$_r$	Rise Time	I$_D$=1A	-	15	-	ns
t$_{d(off)}$	Turn-off Delay Time	R$_G$=3.3Ω	-	18	-	ns
t$_f$	Fall Time	V$_{GS}$=5V	-	4	-	ns
C$_{iss}$	Input Capacitance	V$_{GS}$=0V	-	350	560	pF
C$_{oss}$	Output Capacitance	V$_{DS}$=16V	-	70	-	pF
C$_{rss}$	Reverse Transfer Capacitance	f=1.0MHz	-	60	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V$_{SD}$	Forward On Voltage[2]	I$_S$=0.9A, V$_{GS}$=0V	-	-	1.2	V

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-16	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-4.5V, I_D=-1.5A	-	-	320	mΩ
		V_{GS}=-2.5V, I_D=-1A	-	-	550	mΩ
		V_{GS}=-1.8V, I_D=-0.5A	-	-	900	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-0.2	-	-1	V
g_{fs}	Forward Transconductance	V_{DS}=-5V, I_D=-1A	-	3.6	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-12V, V_{GS}=0V	-	-	-1	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=$\pm$8V, V_{DS}=0V	-	-	$\pm$100	nA
Q_g	Total Gate Charge[2]	I_D=-2A	-	5.5	8.8	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-10V	-	0.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	1.5	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=-10V	-	8	-	ns
t_r	Rise Time	I_D=-1A	-	17	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	18	-	ns
t_f	Fall Time	V_{GS}=-5V	-	7	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	410	660	pF
C_{oss}	Output Capacitance	V_{DS}=-16V	-	60	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	45	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Forward On Voltage[2]	I_S=-0.9A, V_{GS}=0V	-	-	-1.2	V

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board, t$\leq$5sec ; 180℃/W when mounted on min. copper pad.

AP2533GY-HF

N-Channel

Fig 1. Typical Output Characteristics
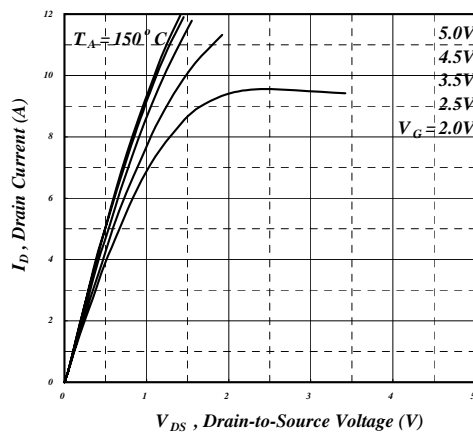

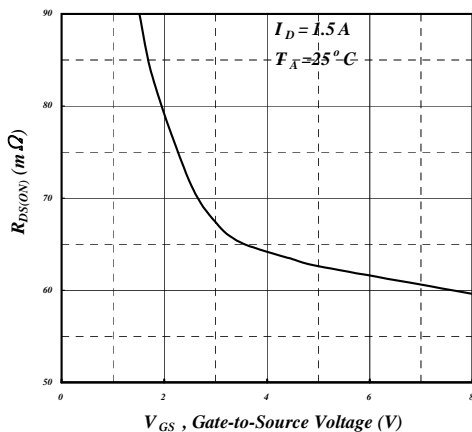**Fig 2. Typical Output Characteristics**

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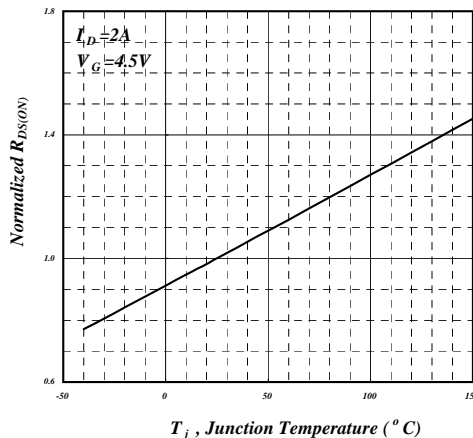

Fig 4. Normalized On-Resistance v.s. Junction Temperature
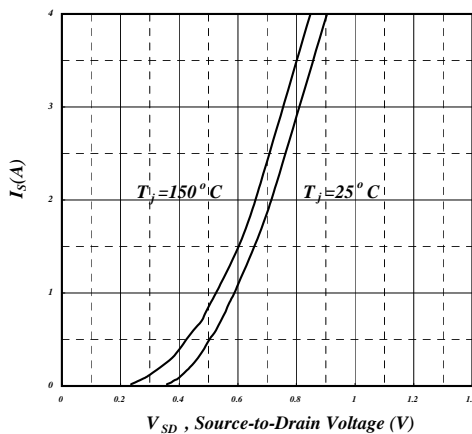

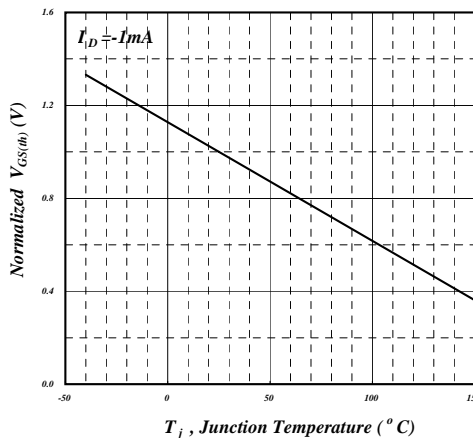**Fig 5. Forward Characteristic of Reverse Diode**

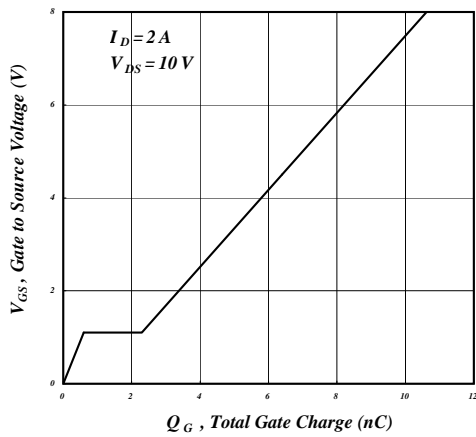

Fig 6. Gate Threshold Voltage v.s. Junction Temperature

4

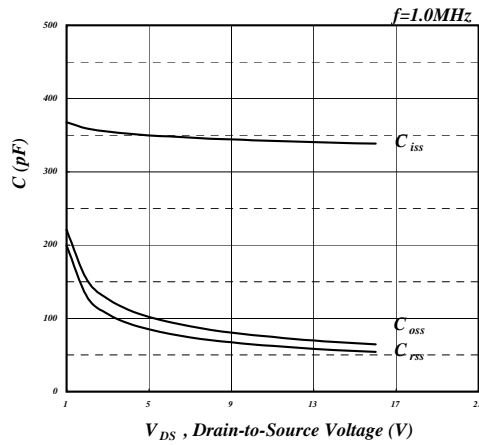**N-Channel**

Fig 7. Gate Charge Characteristics
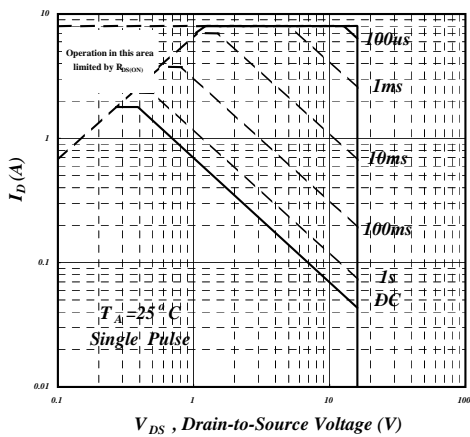

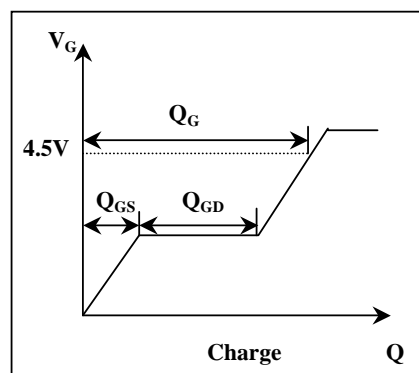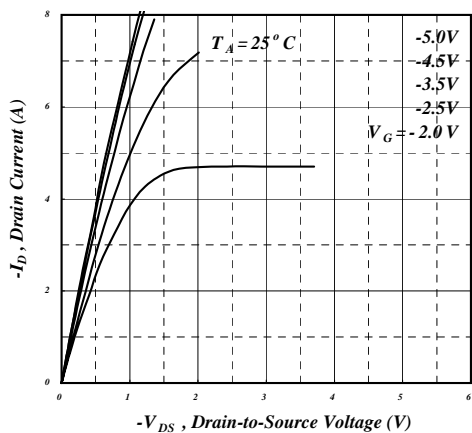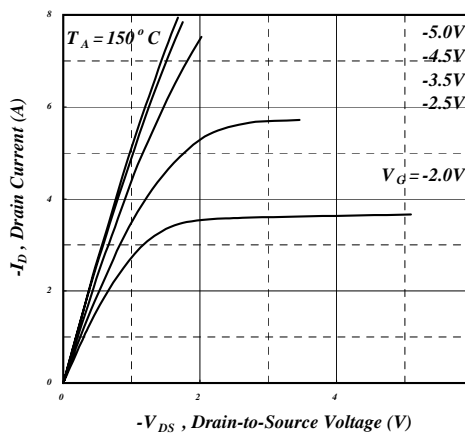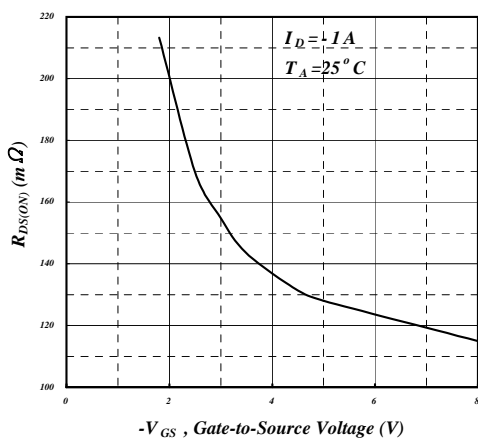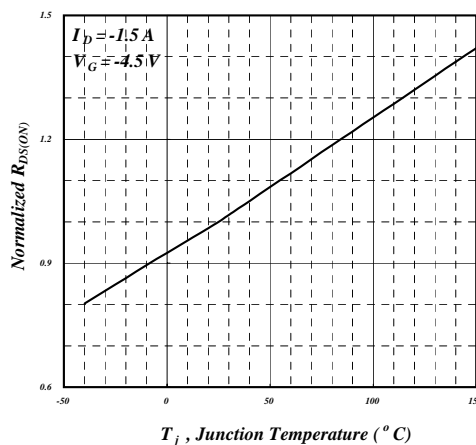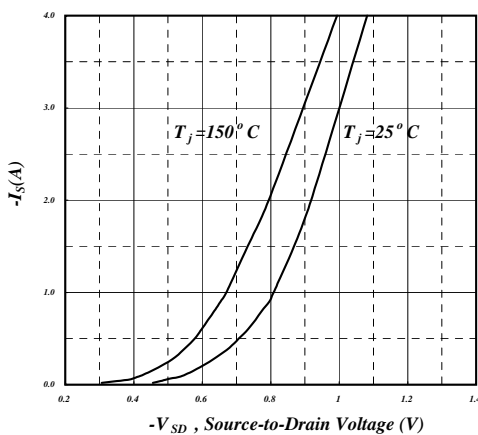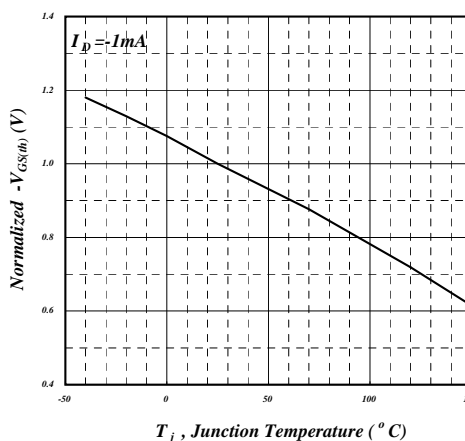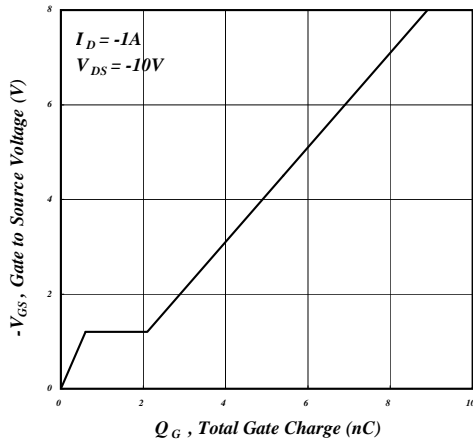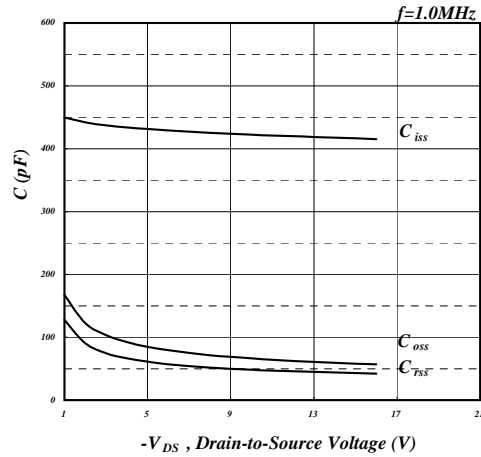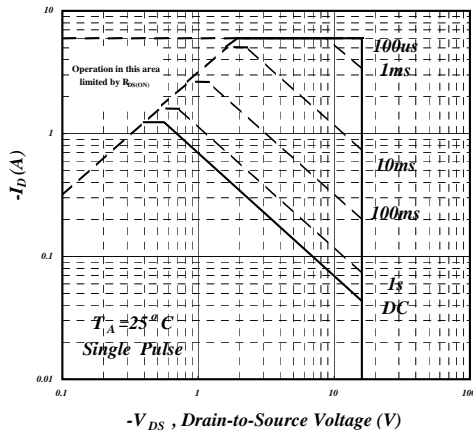Fig 8. Typical Capacitance Characteristics

Fig 9. Maximum Safe Operating Area

Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform

P-Channel

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**

6

P-Channel

Fig 7. Gate Charge Characteristics

Fig 8. Typical Capacitance Characteristics

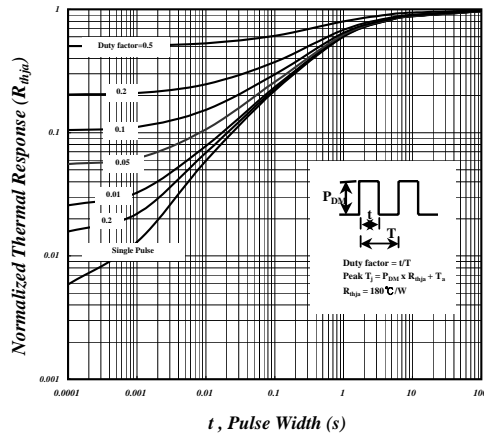Fig 9. Maximum Safe Operating Area

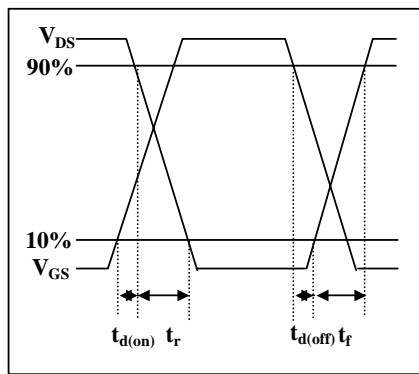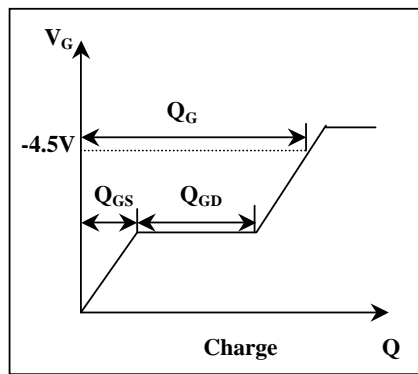Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform