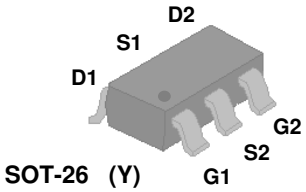
Complementary N and P-channel Enhancement-mode Power MOSFETs

Low Gate Charge

Low On-resistance

Fast Switching Performance

RoHS-compliant, halogen-free



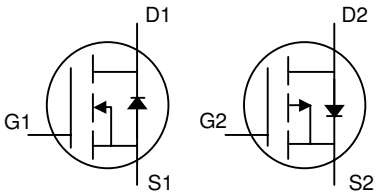
SOT-26 (Y)

N-CH	BV_{DSS}	30V
	$R_{DS(ON)}$	72mΩ
	I_D	3.3A
P-CH	BV_{DSS}	-30V
	$R_{DS(ON)}$	150mΩ
	I_D	-2.3A

Description

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

The AP2530GY-HF-3 is in a standard SOT-26 package, which is widely used for commercial and industrial surface-mount applications, and is well suited for applications such as small DC and servo motor drives.



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		N-channel	P-channel	
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D at T_A=25℃	Continuous Drain Current[3]	3.3	-2.3	A
I_D at T_A=70℃	Continuous Drain Current[3]	2.6	-1.8	A
I_{DM}	Pulsed Drain Current[1]	10	-10	A
P_D at T_A=25℃	Total Power Dissipation	1.14		W
	Linear Derating Factor	0.01		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

Ordering Information

AP2530GY-HF-3TR : in RoHS-compliant, halogen-free SOT-26, shipped on tape and reel (3000 pcs/reel)

N-channel Electrical Specifications at T_j=25℃ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=1mA	-	0.02	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=3A	-	-	72	mΩ
		V_{GS}=4.5V, I_D=2A	-	-	125	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1	-	3	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=3A	-	4	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V, V_{GS}=0V	-	-	1	μA
	Drain-Source Leakage Current (T_j=70°C)	V_{DS}=24V, V_{GS}=0V	-	-	25	μA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=3A	-	3	5	nC
Q_{gs}	Gate-Source Charge	V_{DS}=25V	-	1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	2	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=15V	-	6	-	ns
t_r	Rise Time	I_D=1A	-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω, V_{GS}=10V	-	11	-	ns
t_f	Fall Time	R_D=15Ω	-	2	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	170	270	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	50	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	35	-	pF
R_g	Gate Resistance	f=1.0MHz	-	0.5	0.8	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=0.9A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time[2]	I_S=3A, V_{GS}=0V	-	14	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	7	-	nC

Notes:

1.Pulse width limited by maximum junction temperature.

2.Pulse width≤300us, duty cycle≤ 2%.

3.Surface mounted on 1 in^2 copper pad of FR4 board, t ≤10sec; 180℃/W when mounted on min. copper pad.

P-channel Electrical Specifications at T_j=25℃ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-30	-	-	V
$\Delta BV_{DSS}/\Delta Tj$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=-1mA	-	0.03	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V, I_D=-2A	-	-	150	mΩ
		V_{GS}=-4.5V, I_D=-1A	-	-	280	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-1	-	-3	V
g_{fs}	Forward Transconductance	V_{DS}=-5V, I_D=-2A	-	2	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-30V, V_{GS}=0V	-	-	-1	uA
	Drain-Source Leakage Current (T_j=70°C)	V_{DS}=-24V ,V_{GS}=0V	-	-	-25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=-2A	-	3	5	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-25V	-	1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	2	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=-15V	-	6	-	ns
t_r	Rise Time	I_D=-1A	-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω , V_{GS}=-5V	-	17	-	ns
t_f	Fall Time	R_D=15Ω	-	4	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	150	240	pF
C_{oss}	Output Capacitance	V_{DS}=-25V	-	50	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	40	-	pF
R_g	Gate Resistance	f=1.0MHz	-	8	12	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Forward On Voltage[2]	I_S=-0.9A, V_{GS}=0V	-	-	-1.3	V
t_{rr}	Reverse Recovery Time[2]	I_S=2A, V_{GS}=0V,	-	15	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	7	-	nC

Notes:

1.Pulse width limited by maximum junction temperature.

2.Pulse width≤300us, duty cycle≤ 2%.

3.Surface mounted on 1 in^2 copper pad of FR4 board, t ≤10sec; 180℃/W when mounted on min. copper pad.

Typical N-channel Electrical Characteristics

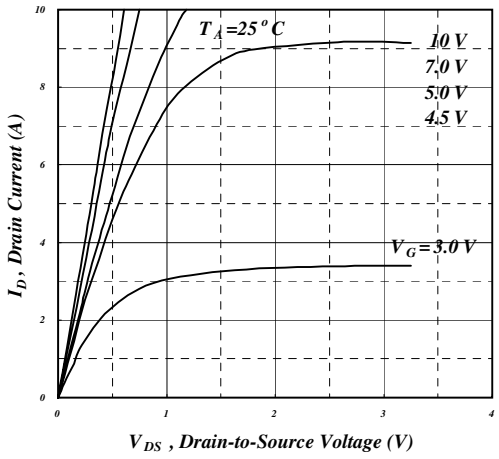


Fig 1. Typical Output Characteristics

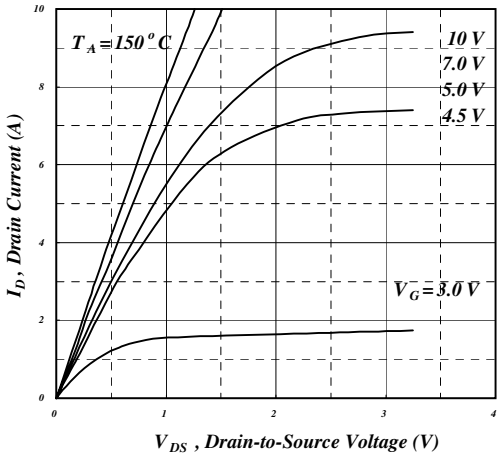


Fig 2. Typical Output Characteristics

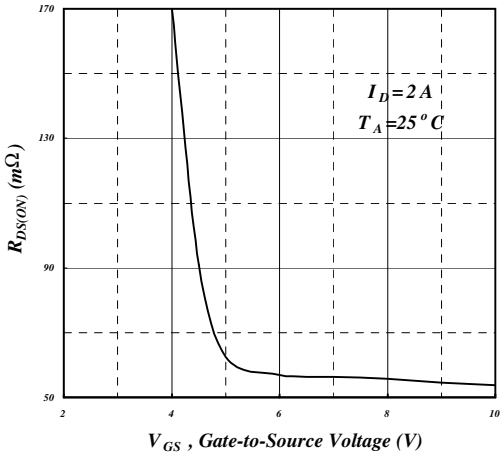


Fig 3. On-Resistance vs. Gate Voltage

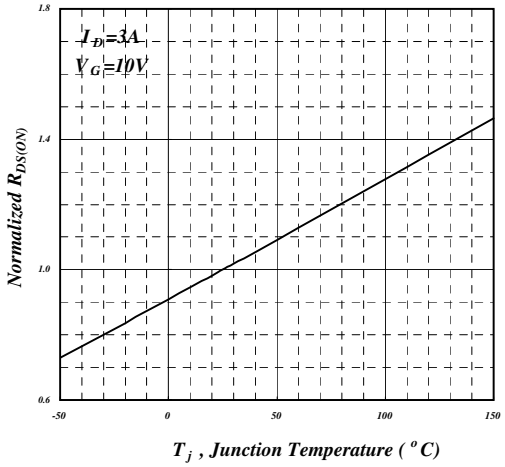


Fig 4. Normalized On-Resistance vs. Junction Temperature

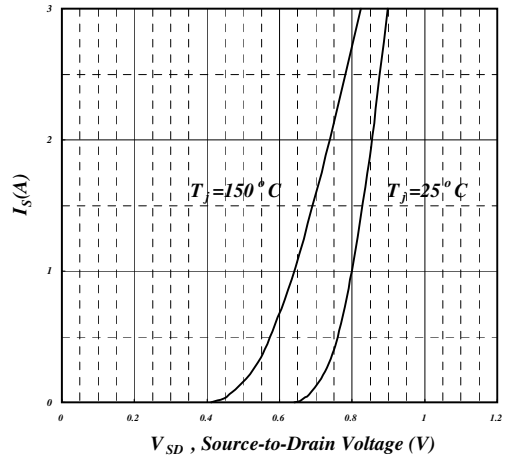


Fig 5. Forward Characteristic of Reverse Diode

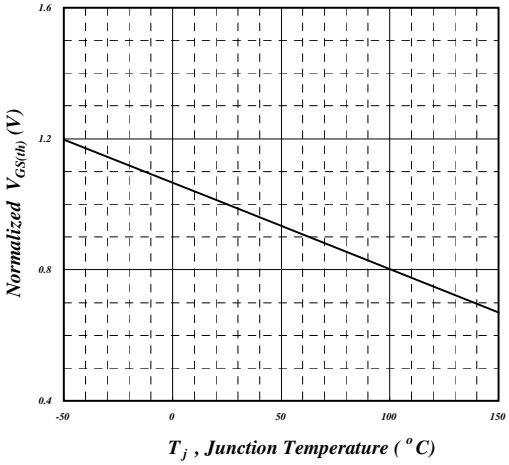


Fig 6. Gate Threshold Voltage vs. Junction Temperature

Typical N-channel Electrical Characteristics (cont.)

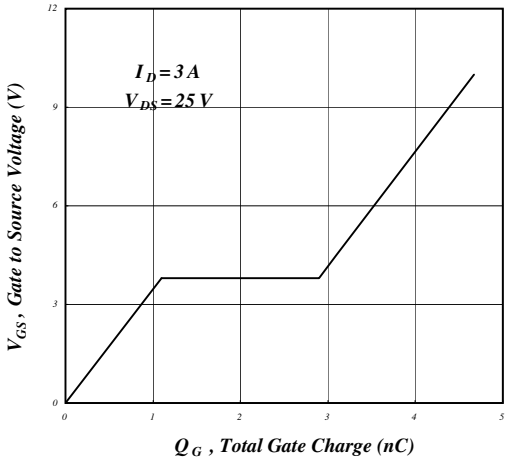


Fig 7. Gate Charge Characteristics

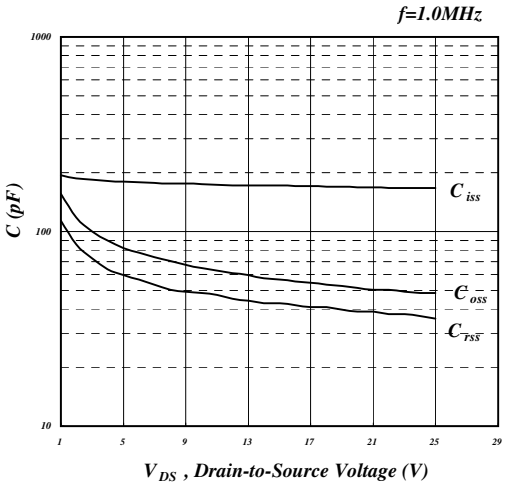


Fig 8. Typical Capacitance Characteristics

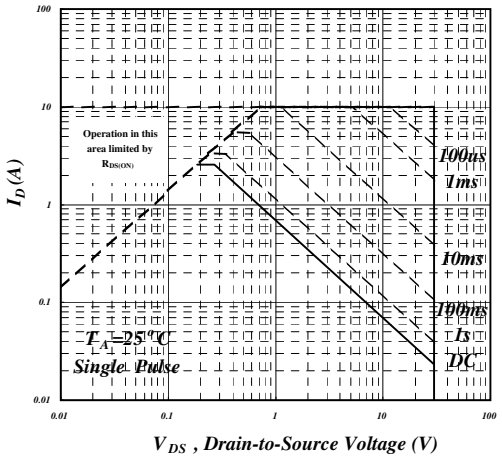


Fig 9. Maximum Safe Operating Area

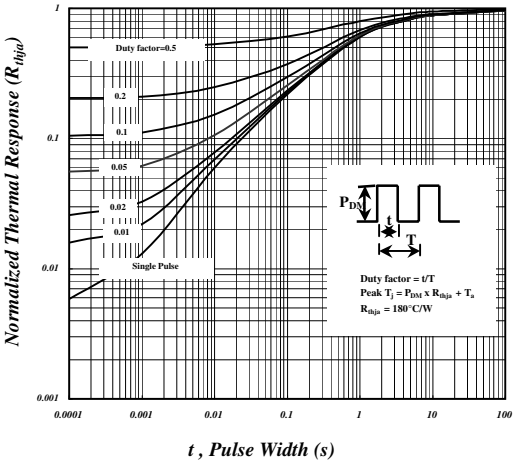


Fig 10. Effective Transient Thermal Impedance

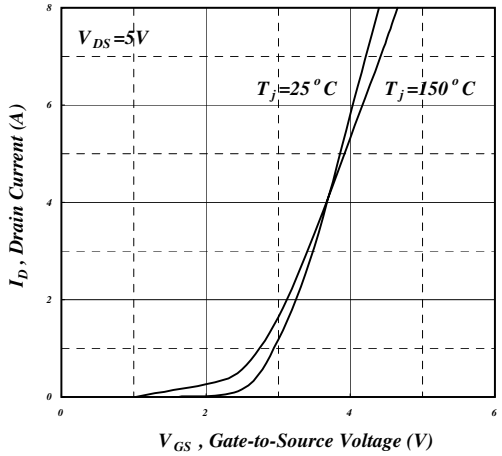


Fig 11. Transfer Characteristics

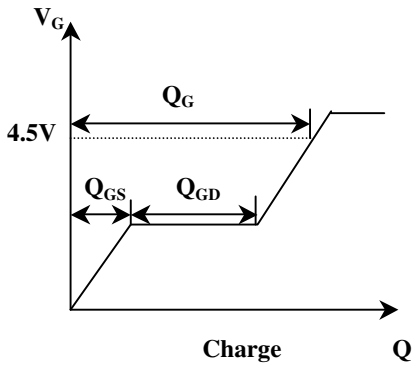


Fig 12. Gate Charge Waveform

Typical P-channel Electrical Characteristics

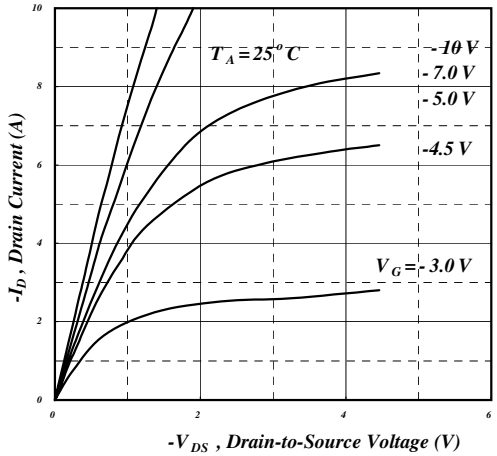


Fig 1. Typical Output Characteristics

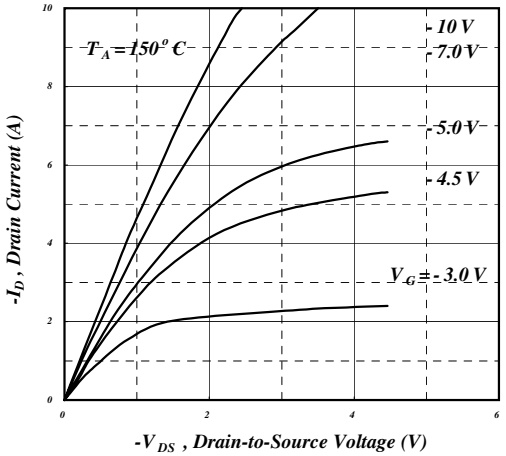


Fig 2. Typical Output Characteristics

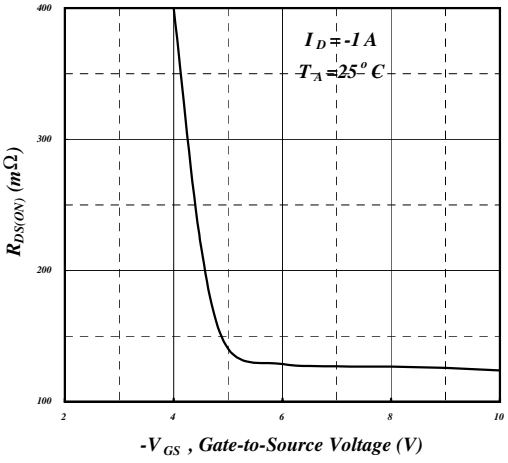


Fig 3. On-Resistance vs. Gate Voltage

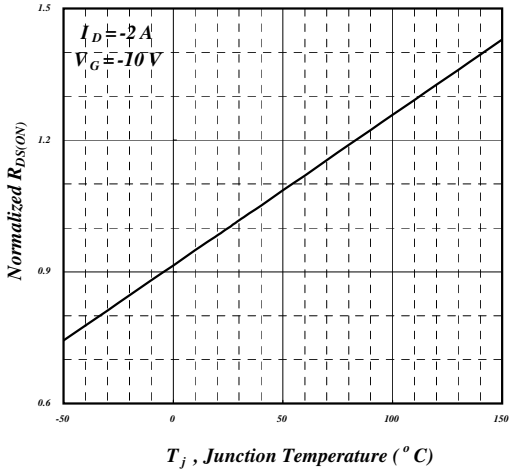


Fig 4. Normalized On-Resistance vs. Junction Temperature

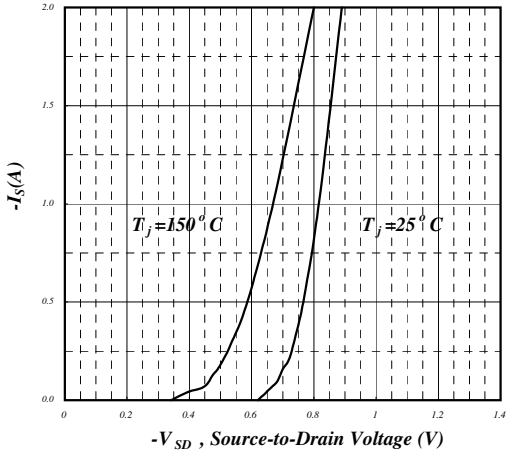


Fig 5. Forward Characteristic of Reverse Diode

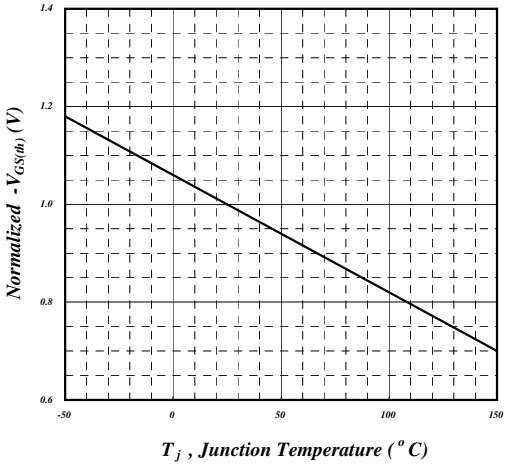


Fig 6. Gate Threshold Voltage vs. Junction Temperature

Typical P-channel Electrical Characteristics (cont.)

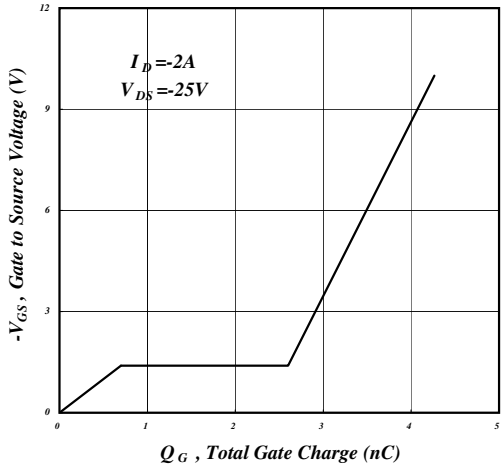


Fig 7. Gate Charge Characteristics

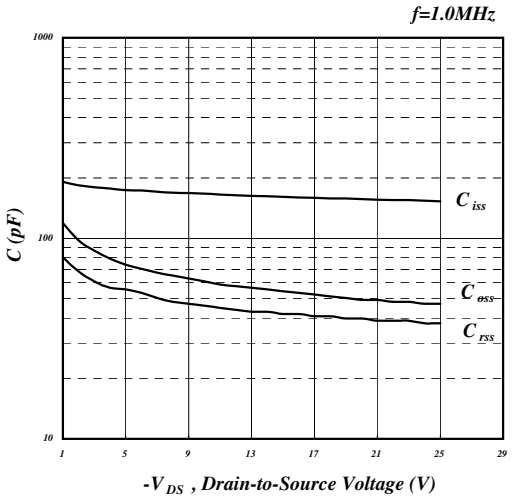


Fig 8. Typical Capacitance Characteristics

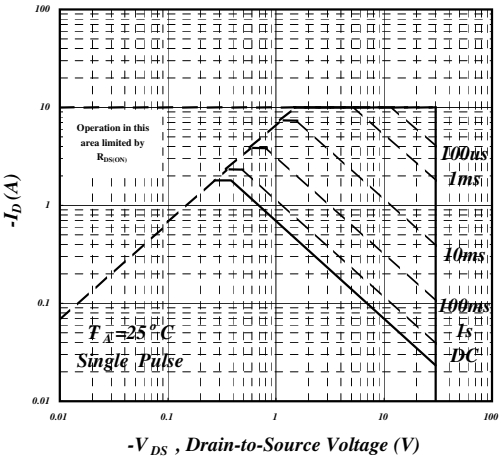


Fig 9. Maximum Safe Operating Area

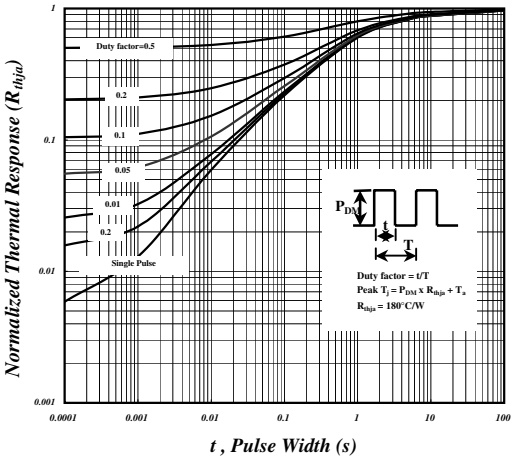


Fig 10. Effective Transient Thermal Impedance

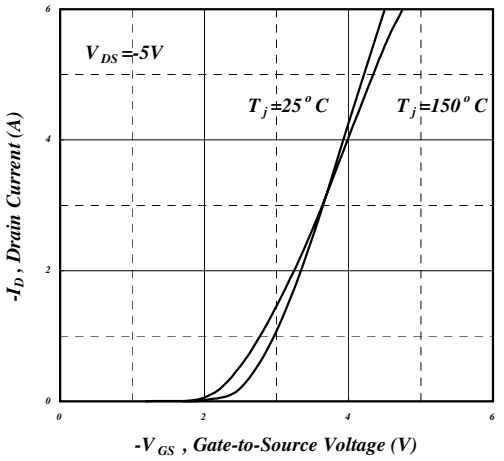


Fig 11. Transfer Characteristics

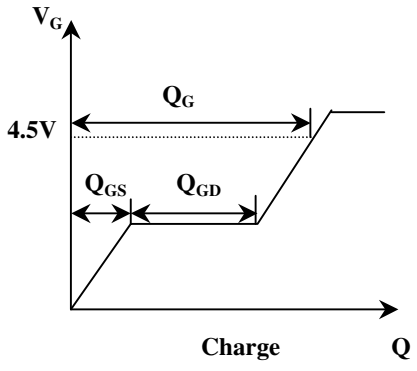
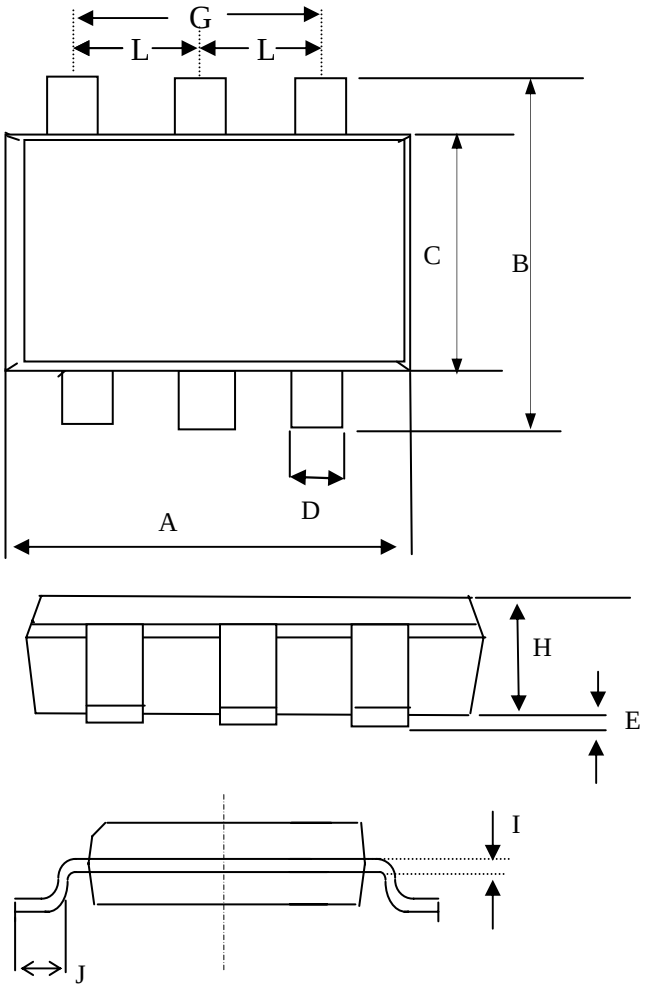


Fig 12. Gate Charge Waveform

Package Dimensions: SOT-26

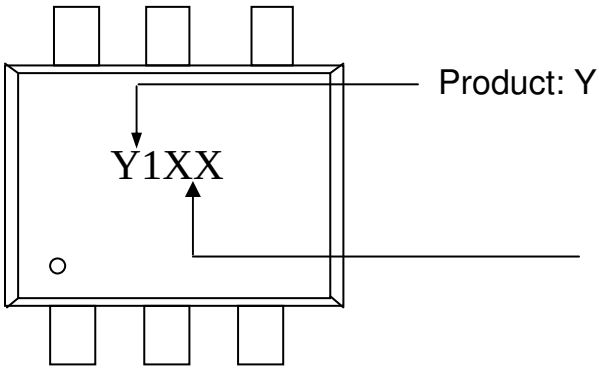


	Millimeters		
SYMBOLS	MIN	NOM	MAX
A	2.70	2.90	3.10
B	2.60	2.80	3.00
C	1.40	1.60	1.80
D	0.30	0.43	0.55
E	0.00	0.05	0.10
H	1.20REF		
G	1.90REF		
I	0.12REF		
J	0.37REF		
L	0.95REF		

1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.

Marking Information: SOT-26

Laser Marking



Product: Y1= AP2530GY-HF-3

XX = Date/lot code
For details of how to convert this to standard YYWW date code format, please contact us directly.