

# Advanced Power Electronics Corp.

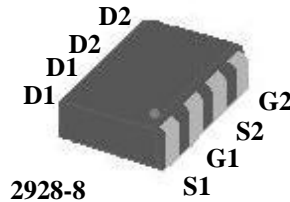
## AP2428GEY

**Pb Free Plating Product**

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

- ▼ Capable of 2.5V gate drive
- ▼ Lower on-resistance
- ▼ Surface mount package
- ▼ RoHS compliant

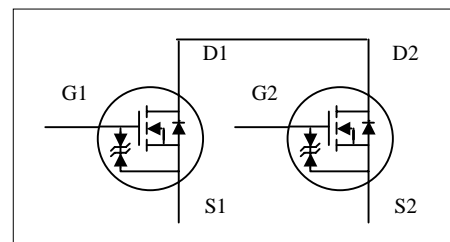


$BV_{DSS}$	30V
$R_{DS(ON)}$	27m $\Omega$
$I_D$	5.9A

### Description

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

The 2928-8 J-lead package provides good on-resistance performance and space saving like TSOP-6.



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 10$	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current <sup>3</sup>	5.9	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current <sup>3</sup>	4.7	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	30	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	1.39	W
	Linear Derating Factor	0.01	W/ $^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

### Thermal Data

Symbol	Parameter	Value	Unit
$R_{thj-a}$	Thermal Resistance Junction-ambient <sup>3</sup>	Max. 90	$^\circ C/W$

# AP2428GEY

## 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	30	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A	-	-	27	mΩ
		V <sub>GS</sub> =4V, I <sub>D</sub> =5A	-	-	28	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3A	-	-	36	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.3	-	1	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =5A	-	14	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current (T <sub>j</sub> =25°C)	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	-	-	1	uA
	Drain-Source Leakage Current (T <sub>j</sub> =70°C)	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V	-	-	10	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±10V	-	-	±30	uA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =5A	-	11	18	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =25V	-	1	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =4.5V	-	4	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =15V	-	8	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =1A	-	10	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =5V	-	24	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =15Ω	-	7	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	610	980	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =25V	-	210	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	75	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	2.2	3.3	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> =1.1A, V <sub>GS</sub> =0V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =5A, V <sub>GS</sub> =0V,	-	24	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs	-	15	-	nC

### Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse width ≤300us , duty cycle ≤2%.
- 3.Surface mounted on FR4 board , t ≤5sec ; 180°C/W at steady state.

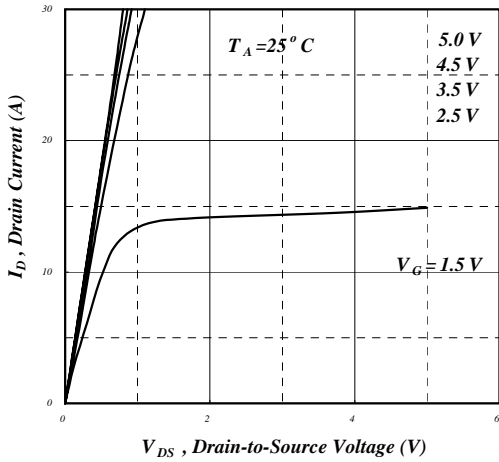


Fig 1. Typical Output Characteristics

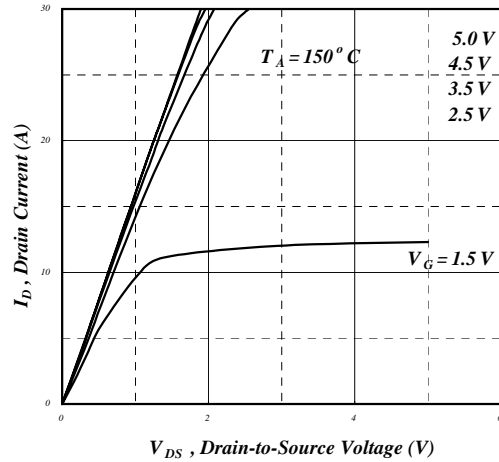


Fig 2. Typical Output Characteristics

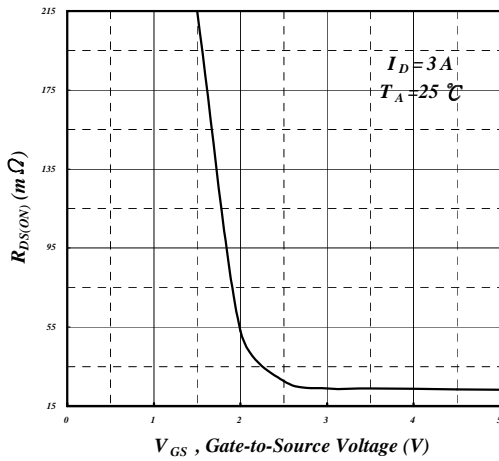


Fig 3. On-Resistance v.s. Gate Voltage

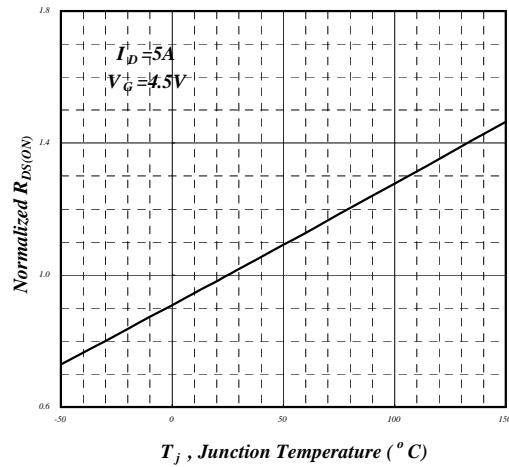


Fig 4. Normalized On-Resistance v.s. Junction Temperature

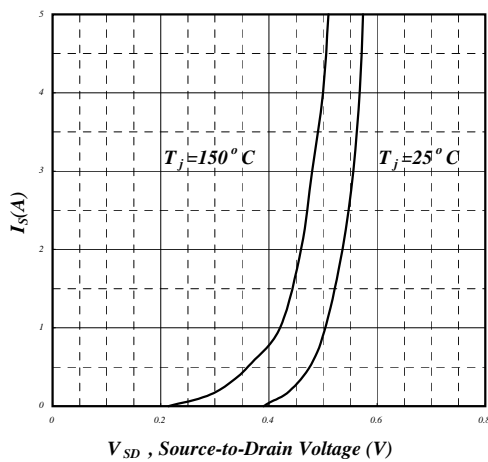


Fig 5. Forward Characteristic of Reverse Diode

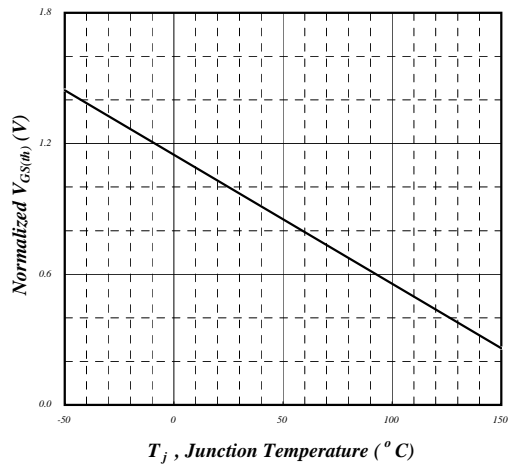


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

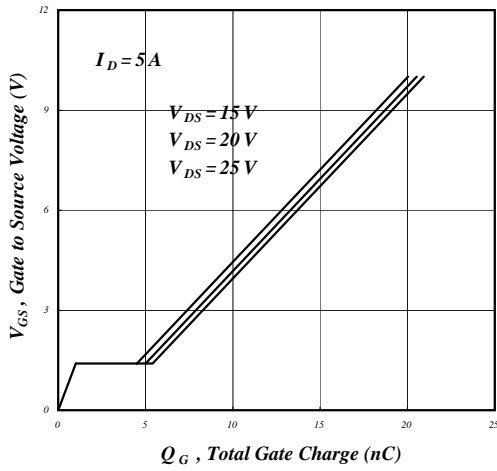


Fig 7. Gate Charge Characteristics

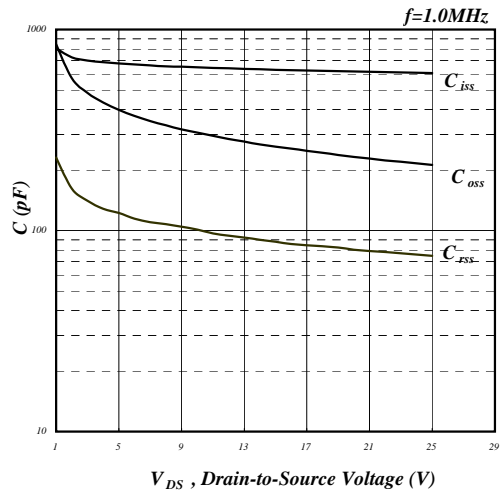


Fig 8. Typical Capacitance Characteristics

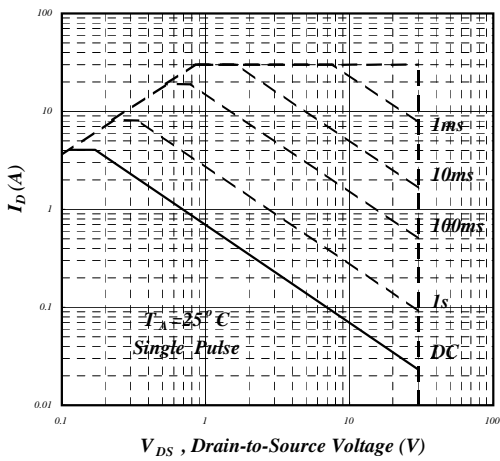


Fig 9. Maximum Safe Operating Area

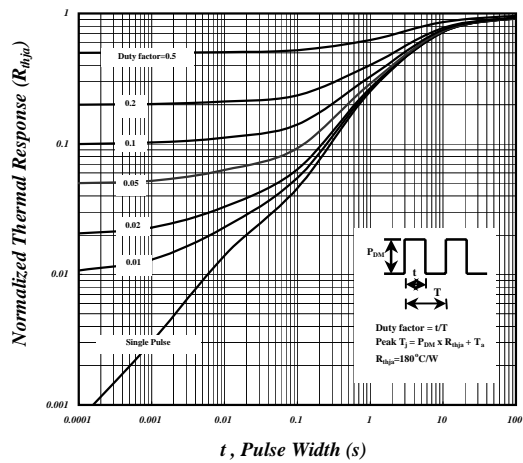


Fig 10. Effective Transient Thermal Impedance

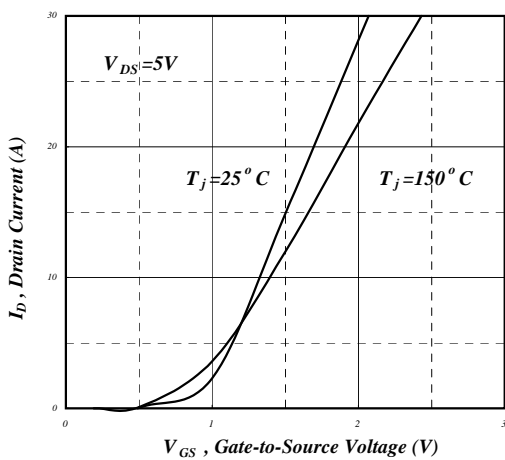


Fig 11. Transfer Characteristics

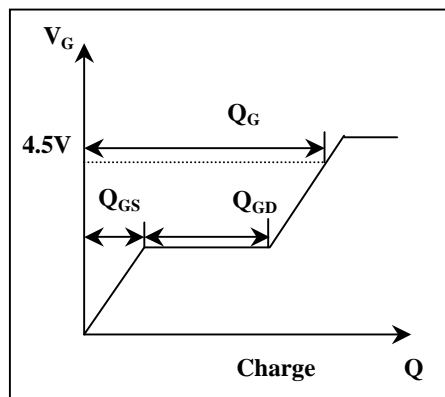


Fig 12. Gate Charge Waveform