

AP18P10GS

RoHS-compliant Product

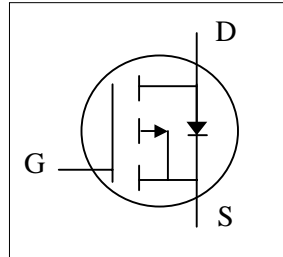


**Advanced Power
Electronics Corp.**

P-CHANNEL ENHANCEMENT MODE

POWER MOSFET

- ▼ Lower Gate Charge
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic

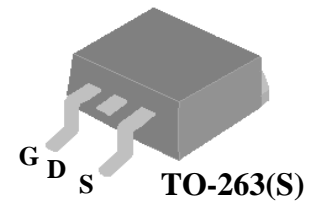


BV_{DSS}	-100V
$R_{DS(ON)}$	160m Ω
I_D	-12A

Description

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

The TO-263 package is widely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	-12	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	-10	A
I_{DM}	Pulsed Drain Current ¹	-48	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	35.7	W
	Linear Derating Factor	0.29	W/ $^\circ C$
E_{AS}	Single Pulse Avalanche Energy ²	40	mJ
I_{AR}	Avalanche Current	-9	A
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-c	Maximum Thermal Resistance, Junction-case	3.5	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62	$^\circ C/W$



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Electrical Characteristics @ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-1mA$	-100	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ³	$V_{GS}=-10V, I_D=-8A$	-	-	160	$m\Omega$
		$V_{GS}=-4.5V, I_D=-6A$	-	-	200	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-	-3	V
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-8A$	-	8	-	S
I_{DSS}	Drain-Source Leakage Current ($T_j=25^\circ\text{C}$)	$V_{DS}=-100V, V_{GS}=0V$	-	-	-1	μA
	Drain-Source Leakage Current ($T_j=150^\circ\text{C}$)	$V_{DS}=-80V, V_{GS}=0V$	-	-	-25	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V$	-	-	± 100	nA
Q_g	Total Gate Charge ³	$I_D=-8A$	-	16	25.6	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=-80V$	-	4.4	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=-4.5V$	-	8.7	-	nC
$t_{d(on)}$	Turn-on Delay Time ³	$V_{DS}=-50V$	-	9	-	ns
t_r	Rise Time	$I_D=-8A$	-	14	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega, V_{GS}=-10V$	-	45	-	ns
t_f	Fall Time	$R_D=6.25\Omega$	-	40	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	1590	2550	pF
C_{oss}	Output Capacitance	$V_{DS}=-25V$	-	110	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0MHz$	-	70	-	pF
R_g	Gate Resistance	$f=1.0MHz$	-	8	12	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ³	$I_S=-12A, V_{GS}=0V$	-	-	-1.3	V
t_{rr}	Reverse Recovery Time ³	$I_S=-8A, V_{GS}=0V,$	-	49	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=-100A/\mu s$	-	110	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Starting $T_j=25^\circ\text{C}$, $V_{DD}=-50V$, $L=1.0mH$, $R_G=25\Omega$.
3. Pulse test

THIS PRODUCT IS ELECTROSTATIC SENSITIVE, PLEASE HANDLE WITH CAUTION.

THIS PRODUCT HAS BEEN QUALIFIED FOR USE IN CONSUMER APPLICATIONS. APPLICATIONS OR USE IN LIFE SUPPORT OR OTHER SIMILAR MISSION-CRITICAL DEVICES OR SYSTEMS ARE NOT AUTHORIZED.

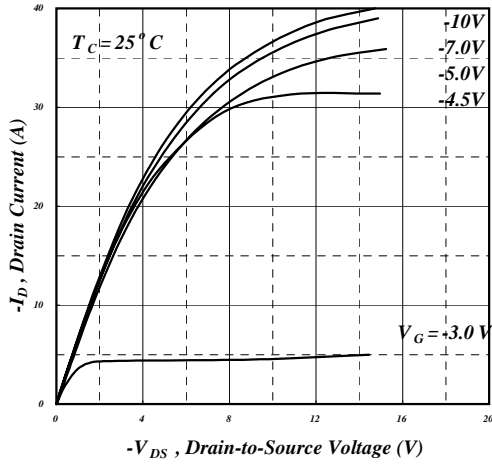


Fig 1. Typical Output Characteristics

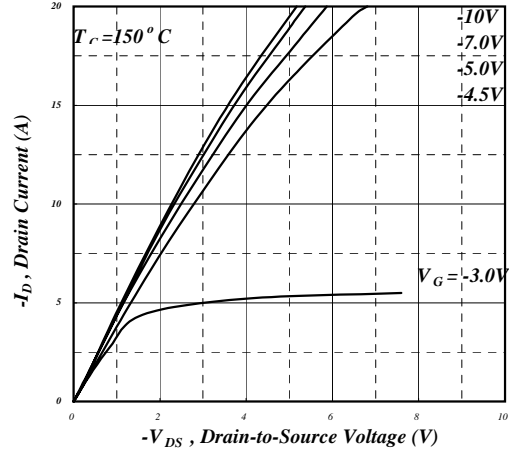


Fig 2. Typical Output Characteristics

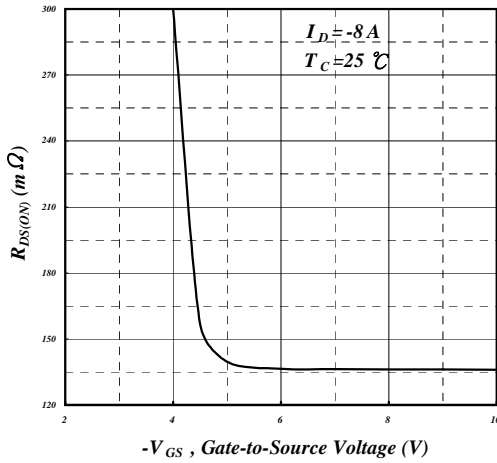


Fig 3. On-Resistance v.s. Gate Voltage

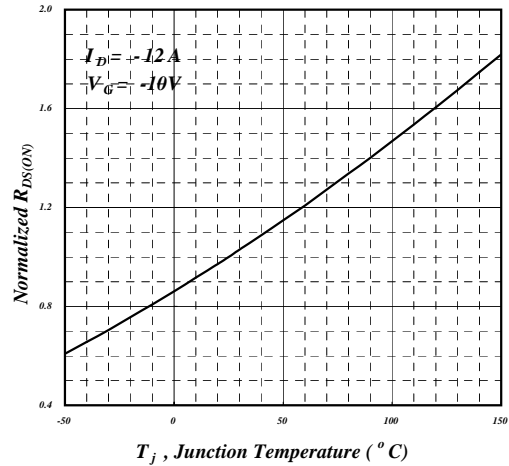


Fig 4. Normalized On-Resistance v.s. Junction Temperature

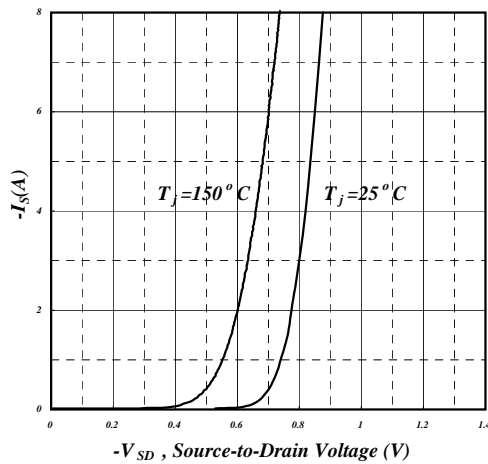


Fig 5. Forward Characteristic of Reverse Diode

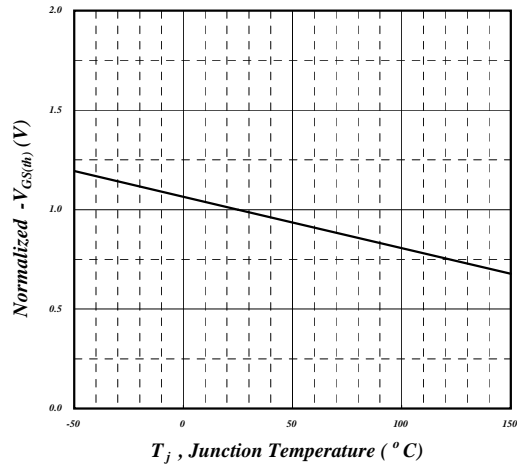


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

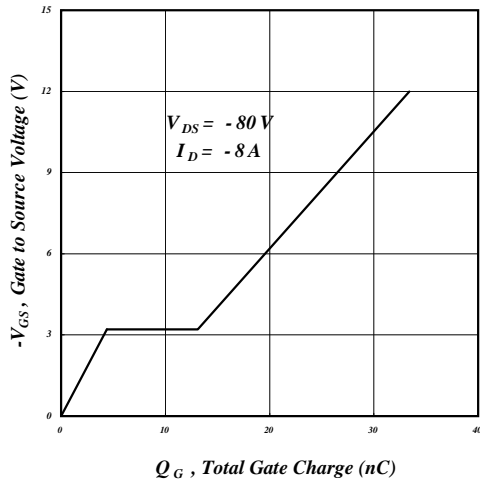


Fig 7. Gate Charge Characteristics

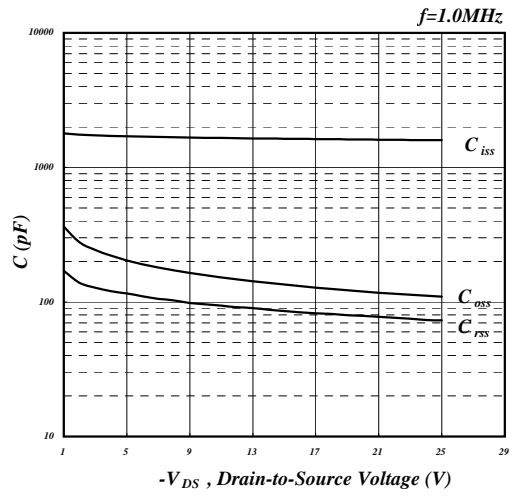


Fig 8. Typical Capacitance Characteristics

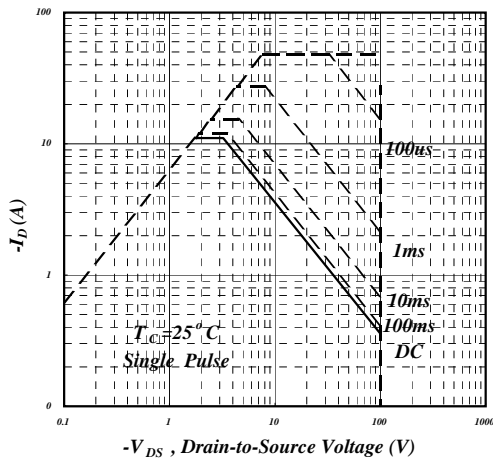


Fig 9. Maximum Safe Operating Area

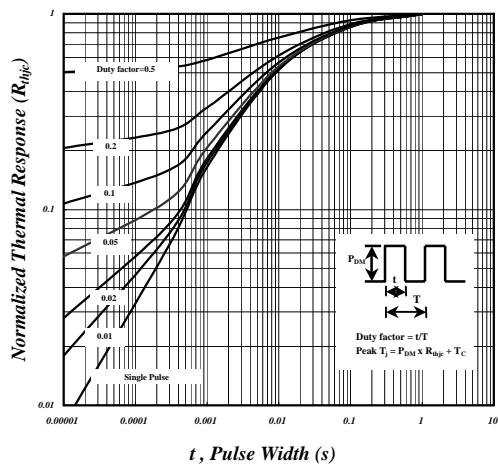


Fig 10. Effective Transient Thermal Impedance

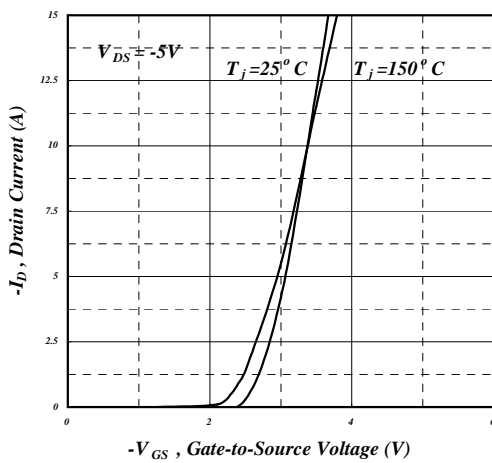


Fig 11. Transfer Characteristics

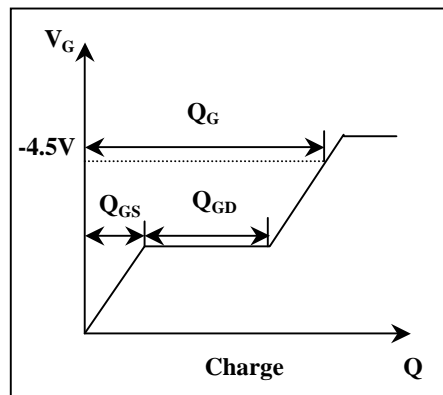
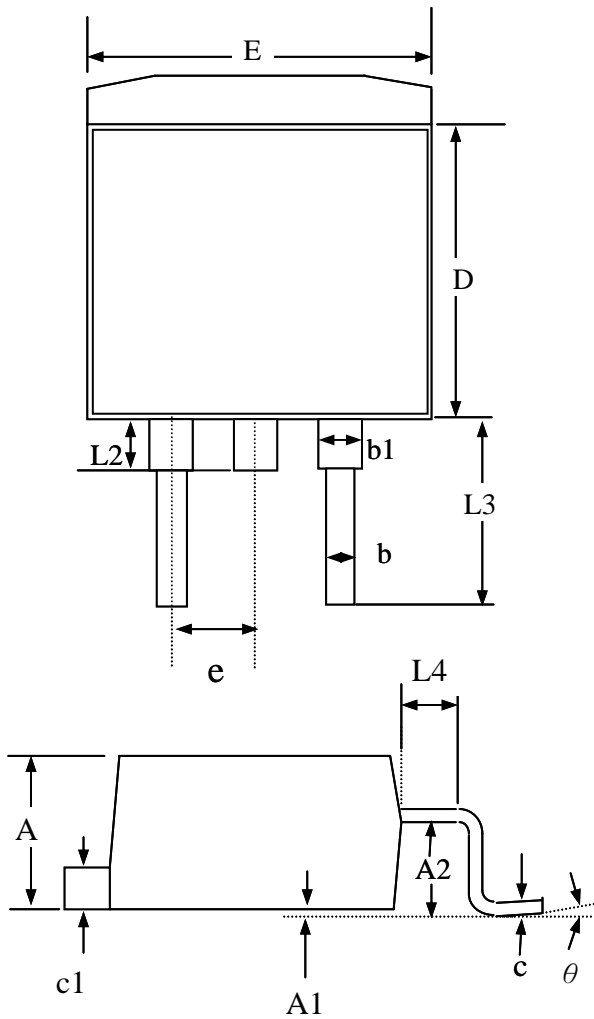


Fig 12. Gate Charge Waveform



Package Outline : TO-263



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.25	4.75	5.20
A1	0.00	0.15	0.30
A2	2.20	2.45	2.70
b	0.70	0.90	1.10
b1	1.07	1.27	1.47
c	0.30	0.45	0.60
c1	1.15	1.30	1.45
D	8.30	8.90	9.40
E	9.70	10.10	10.50
e	2.04	2.54	3.04
L2	-----	1.50	-----
L3	4.50	4.90	5.30
L4	-----	1.50	----

- 1.All Dimensions Are in Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.

Part Marking Information & Packing : TO-263

