



N-channel Enhancement-mode Power MOSFET

- Simple Drive Requirement**
- Low Gate-charge**
- Fast Switching Performance**
- RoHS-compliant, halogen-free**

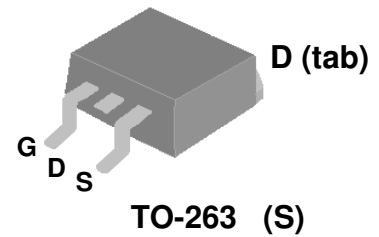


BV_{DSS}	100V
$R_{DS(ON)}$	30mΩ
I_D	37A

Description

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

The AP50T10GS-HF-3 is in the TO-263 surface-mount package which is used in commercial and industrial applications. This device is well-suited for medium 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 at $T_C=25^\circ C$	Continuous Drain Current	37	A
I_D at $T_C=100^\circ C$	Continuous Drain Current	23	A
I_{DM}	Pulsed Drain Current ¹	120	A
P_D at $T_C=25^\circ C$	Total Power Dissipation	89.2	W
P_D at $T_A=25^\circ C$	Total Power Dissipation	3.125	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	1.4	°C/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	40	°C/W

Ordering Information

AP50T10GS-HF-3TR : in RoHS-compliant halogen-free TO-263, shipped on tape and reel (800 pcs/reel)



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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=24A$	-	-	30	m Ω
		$V_{GS}=5V, I_D=16A$	-	-	70	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	3	V
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=24A$	-	30	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V$	-	-	25	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Q_g	Total Gate Charge ²	$I_D=24A$	-	42	67	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=80V$	-	8	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=10V$	-	19	-	nC
$t_{d(on)}$	Turn-on Delay Time ²	$V_{DS}=50V$	-	11	-	ns
t_r	Rise Time	$I_D=24A$	-	42	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=1\Omega$	-	26	-	ns
t_f	Fall Time	$V_{GS}=10V$	-	8.5	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	1840	2940	pF
C_{oss}	Output Capacitance	$V_{DS}=25V$	-	190	-	pF
C_{riss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	130	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	1.7	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=24A, V_{GS}=0V$	-	-	1.3	V
t_{rr}	Reverse Recovery Time ²	$I_S=10A, V_{GS}=0V$	-	40	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$	-	80	-	nC

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test
3. Surface mounted on 1 in2 copper pad of FR4 board

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.

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Typical Electrical Characteristics

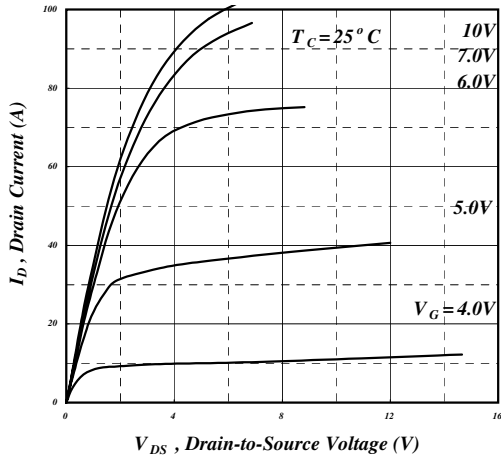


Fig 1. Typical Output Characteristics

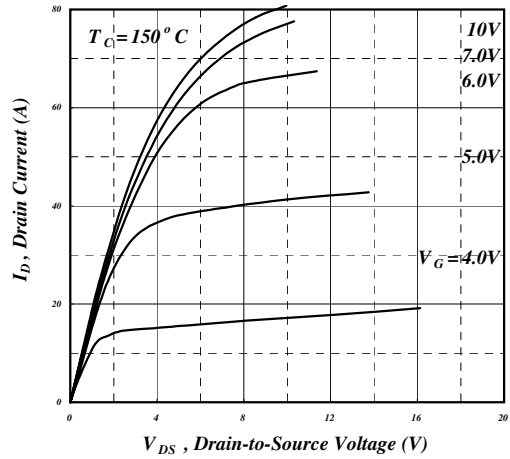


Fig 2. Typical Output Characteristics

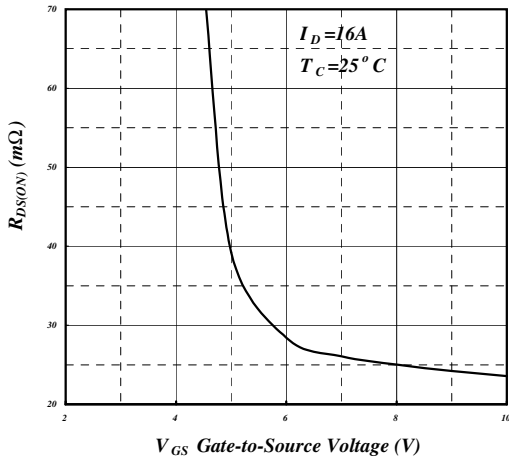


Fig 3. On-Resistance v.s. Gate Voltage

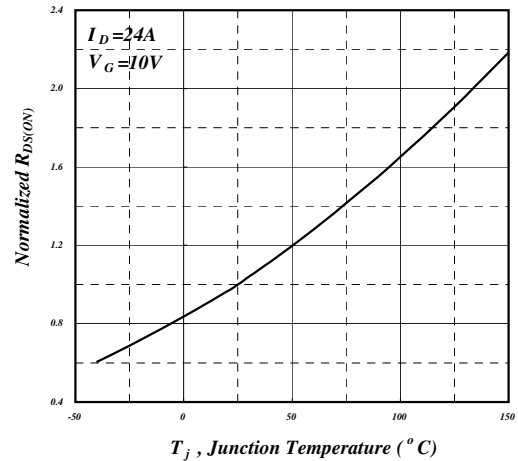


Fig 4. Normalized On-Resistance vs. Junction Temperature

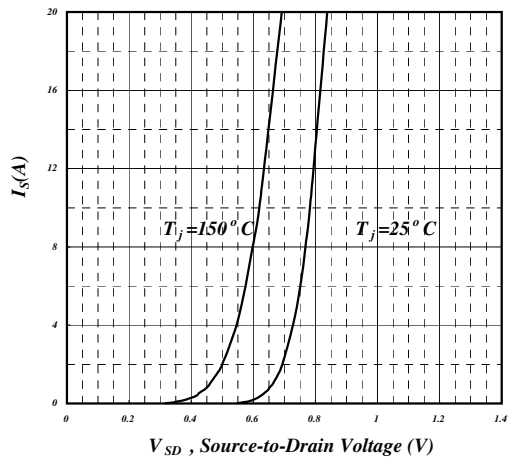


Fig 5. Forward Characteristic of Reverse Diode

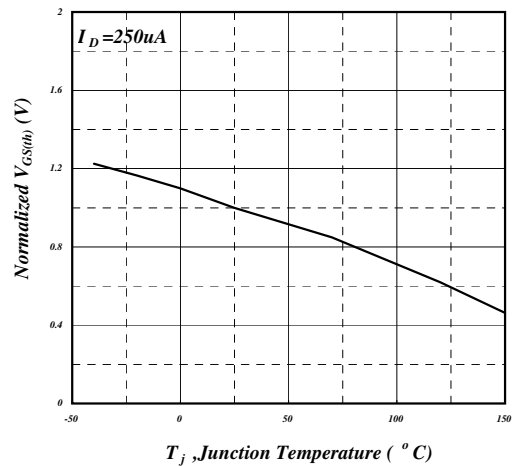


Fig 6. Gate Threshold Voltage vs. Junction Temperature



Typical Electrical Characteristics (cont.)

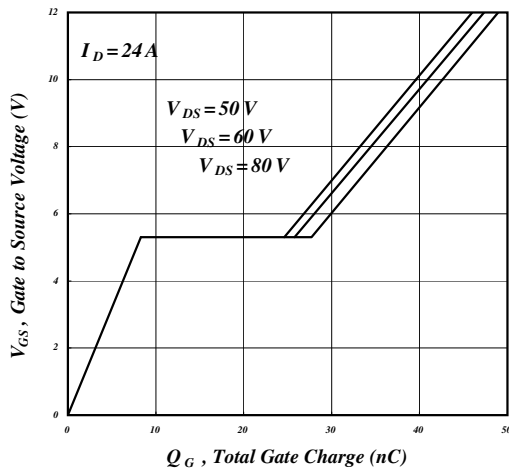


Fig 7. Gate Charge Characteristics

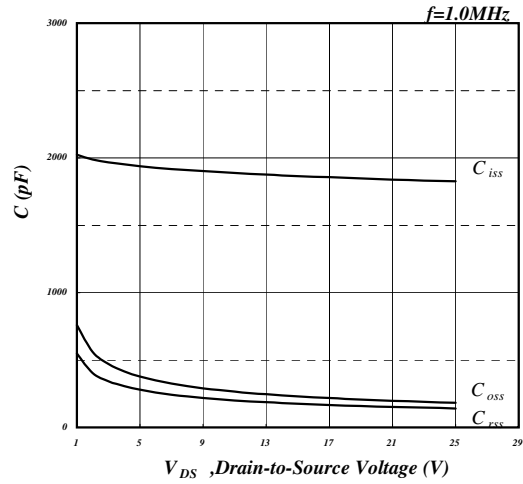


Fig 8. Typical Capacitance Characteristics

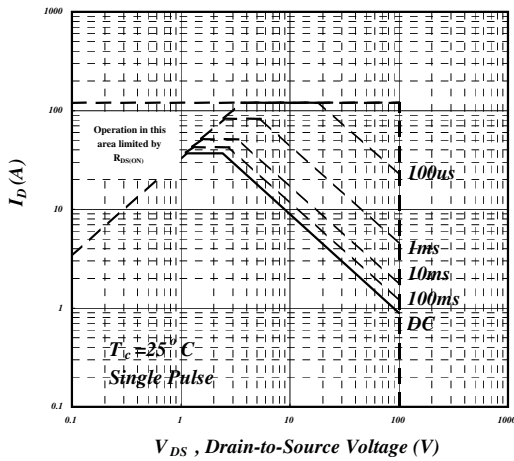


Fig 9. Maximum Safe Operating Area

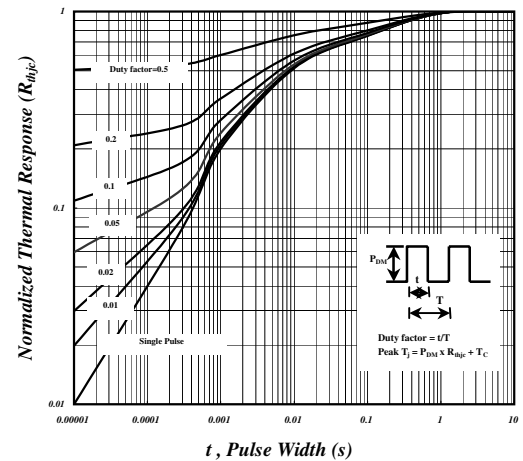


Fig 10. Effective Transient Thermal Impedance

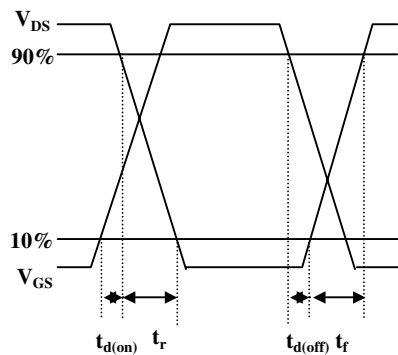


Fig 11. Switching Time Waveforms

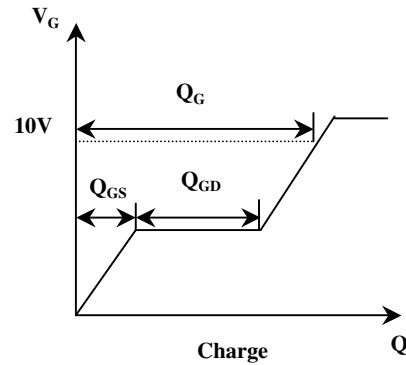
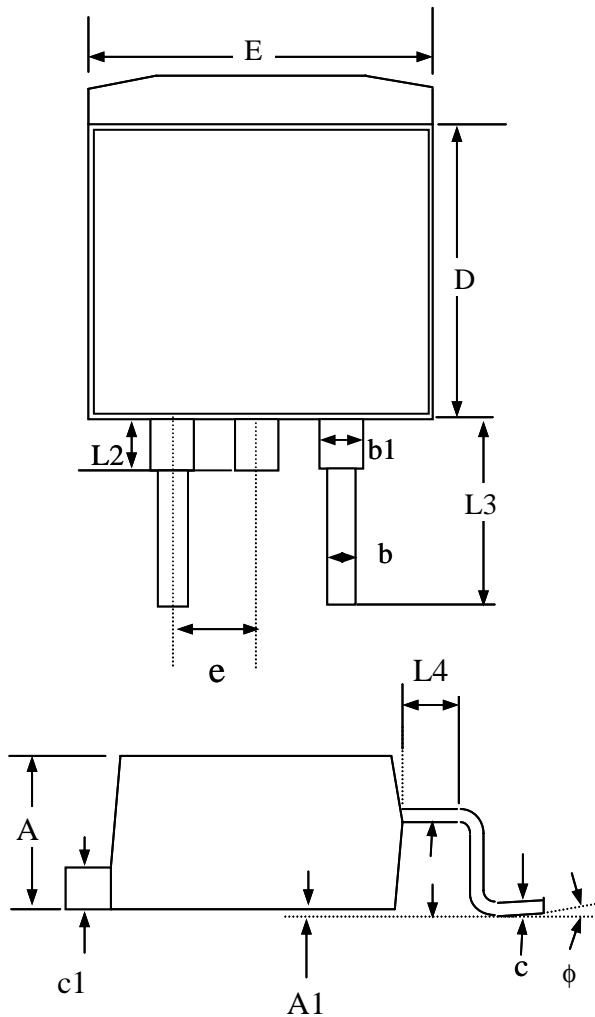


Fig 12. Gate Charge Waveform



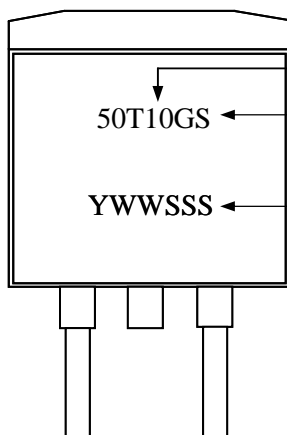
Package Dimensions: TO-263



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. Dimensions do not include mold protrusions.

Marking Information:



Product: AP50T10
 Package code:
 GS = RoHS-compliant halogen-free TO-263
 Date Code (YWWSSS)
 Y : Last digit of the year
 WW : Work week
 SSS : Lot code sequence