

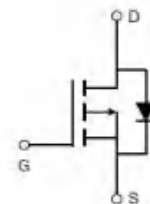
AP15P03Q

P-Channel Enhancement Mosfet



Feature

- -30V,-12A
 $R_{DS(ON)} < 18m\Omega @ V_{GS} = -10V$ TYP:15 m Ω
 $R_{DS(ON)} < 35m\Omega @ V_{GS} = -4.5V$ TYP:25 m Ω
- Trench DMOS Power MOSFET
- Fast Switching
- Exceptional on-resistance and maximum DC current capability



Schematic Diagram

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch



Marking and pin Assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
15P03Q	AP15P03Q	PDFN3X3	13 inch	-	5000

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_c = 25^\circ\text{C}$)	I_D	-12	A
Continuous Drain Current ($T_c = 100^\circ\text{C}$)	I_D	-7.8	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	-48	A
Single Pulsed Avalanche Energy ⁽⁴⁾	E_{AS}	25	mJ
Power Dissipation	P_D	4.8	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	26	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

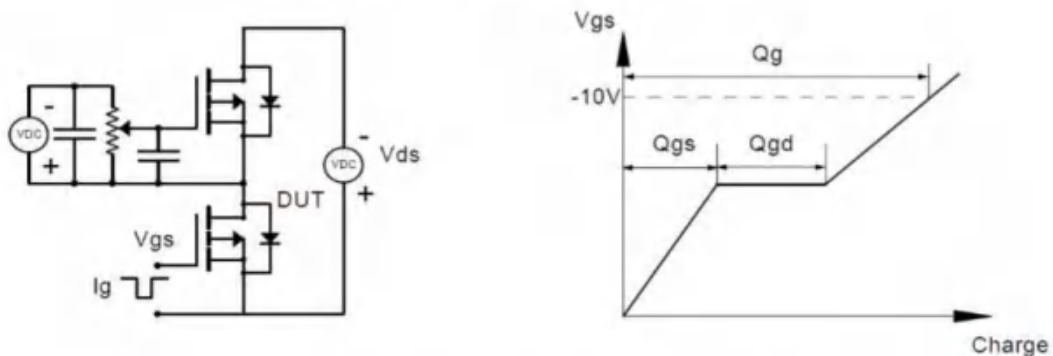
MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =-250μA	-30	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-30V, V _{GS} = 0V	-	-	-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage ⁽²⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.5	-2.5	V
Drain-source on-resistance ⁽²⁾	R _{DS(on)}	V _{GS} =-10V, I _D =-10A	-	15	18	mΩ
		V _{GS} =-4.5V, I _D =-10A	-	25	34	
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, f =1MHz	-	1550	-	pF
Output Capacitance	C _{oss}		-	327	-	
Reverse Transfer Capacitance	C _{rss}		-	278	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =-15V, I _D =6A V _{GS} =-10V, R _G =2.5Ω	-	14	-	ns
Turn-on rise time	t _r		-	20	-	
Turn-off delay time	t _{d(off)}		-	95	-	
Turn-off fall time	t _f		-	65	-	
Total Gate Charge	Q _g	V _{DS} =-15V, I _D =-10A, V _{GS} =-10V	-	30	-	nC
Gate-Source Charge	Q _{gs}		-	5.3	-	
Gate-Drain Charge	Q _{gd}		-	7.6	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽²⁾	V _{DS}	V _{GS} =0V, I _S =--10A	-	-	-1.2	V
Diode Forward current ⁽³⁾	I _S		-	-	-10	A

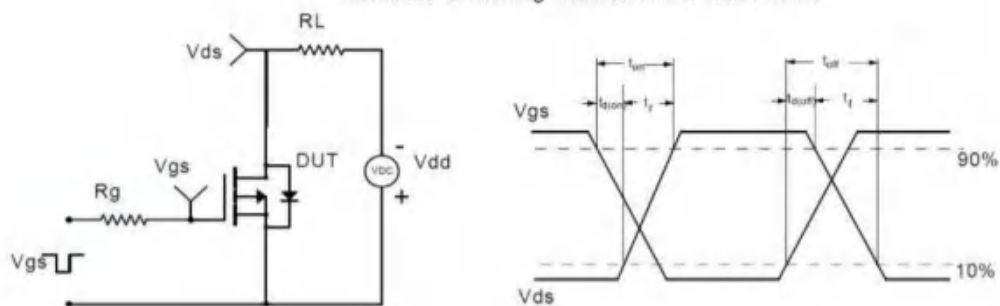
Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width ≤ 300μs, duty cycle ≤ 2%
3. Surface Mounted on FR4 Board, t ≤ 10 sec
4. L = 0.5mH, V_{DD} = -15V, R_G = 25Ω, T_J = 25°C

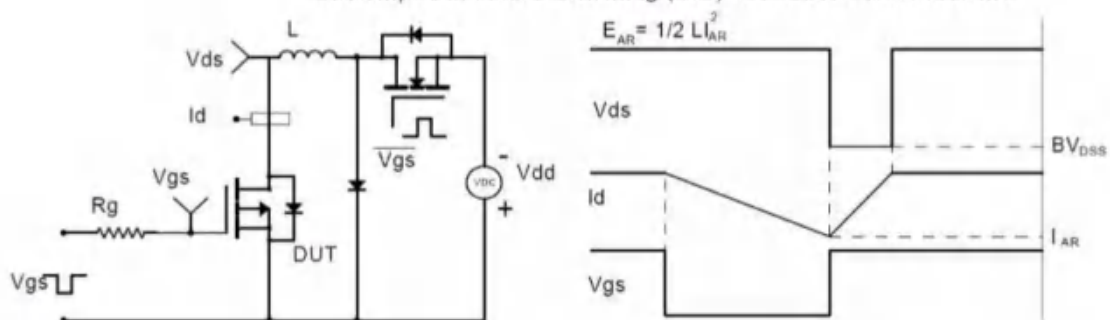
Gate Charge Test Circuit & Waveform



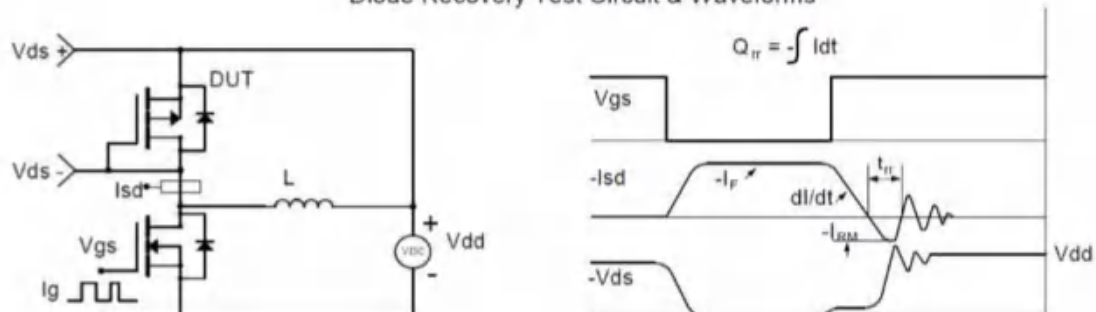
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Performance Characteristics

Figure1: Output Characteristics

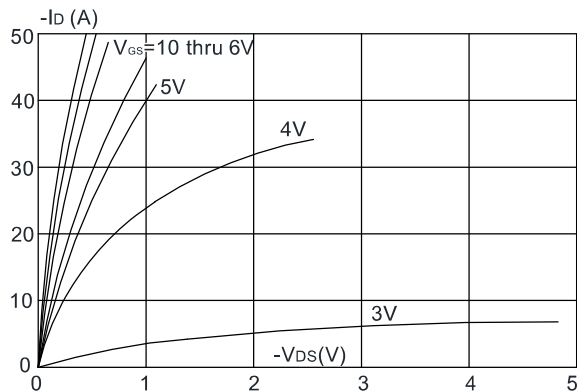


Figure 2: Typical Transfer Characteristics

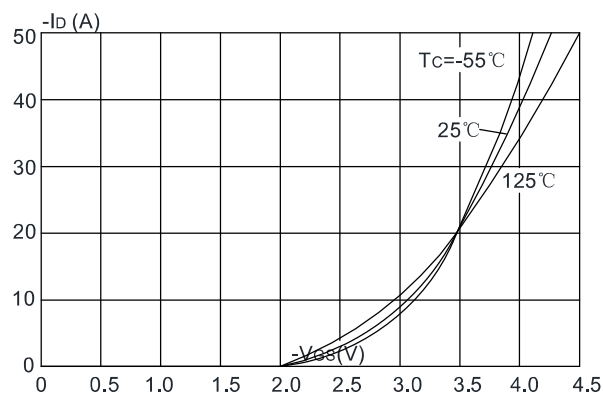


Figure 3: On-resistance vs. Drain Current

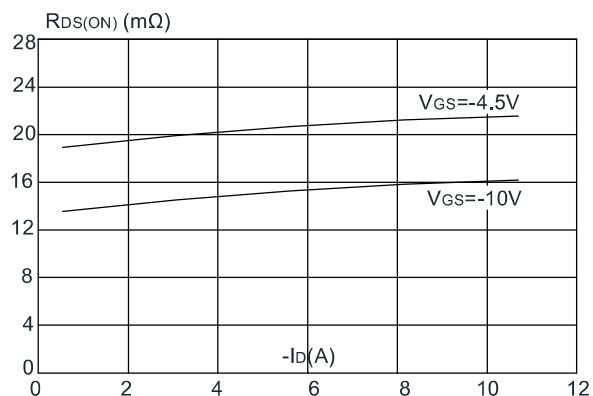


Figure 4: Body Diode Characteristics

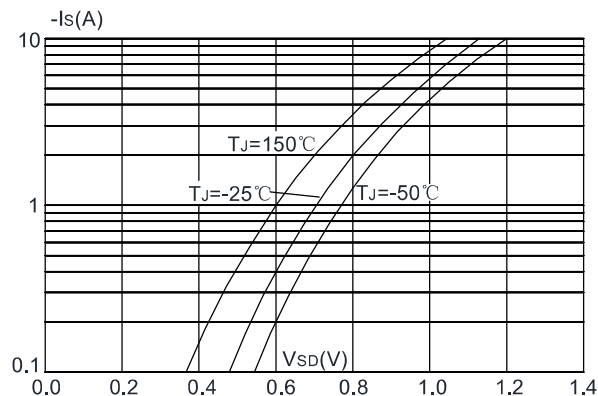


Figure 5: Gate Charge Characteristics

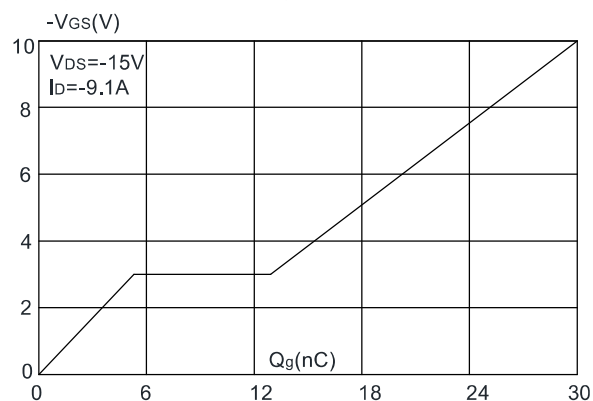
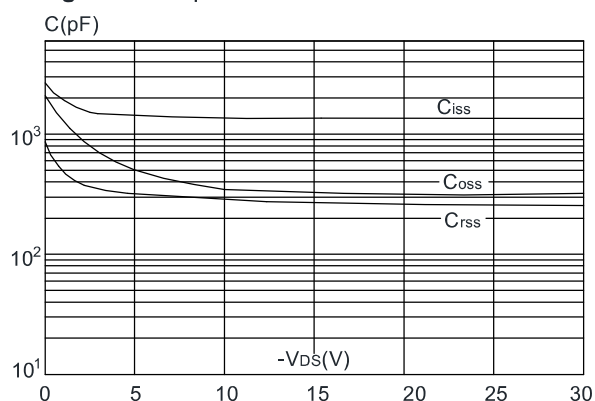


Figure 6: Capacitance Characteristics



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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

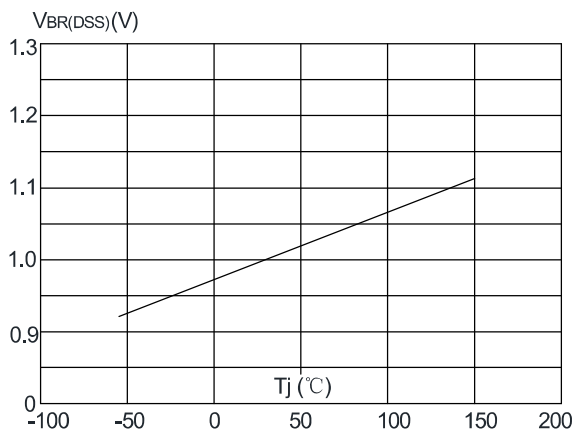


Figure 8: Normalized on Resistance vs. Junction Temperature

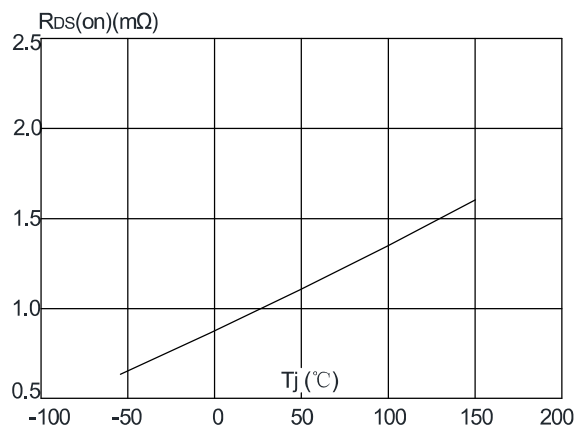


Figure 9: Maximum Safe Operating Area

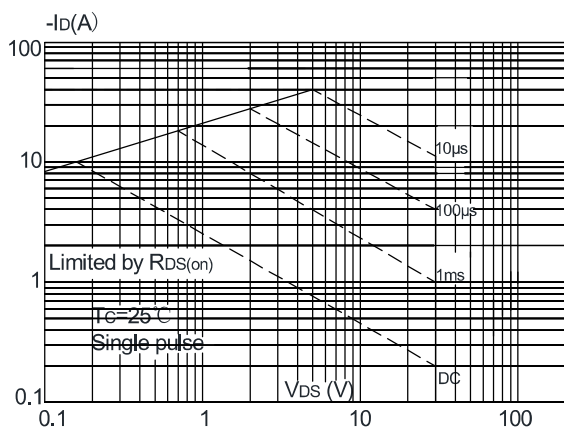


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

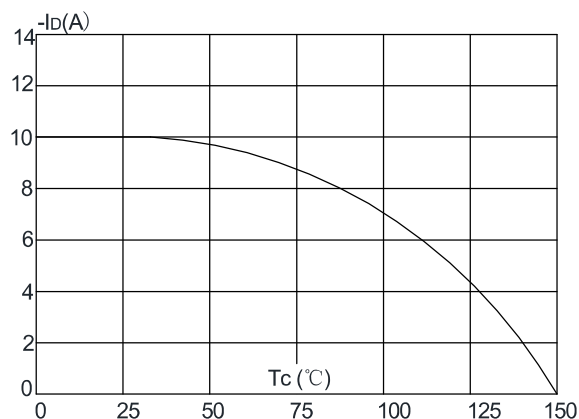
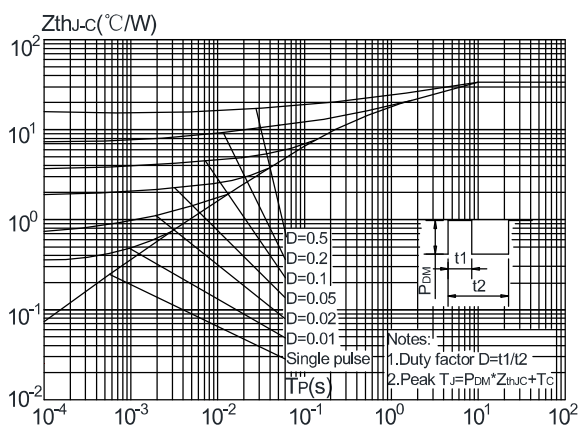


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



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PDFN3X3 Package Information

