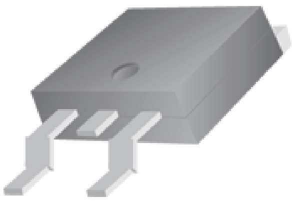
P-Channel 40-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

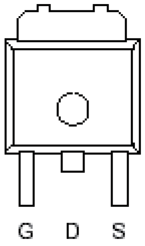
PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ m(Ω)	I_D (A)
-40	69 @ V_{GS} = -10V	22
	106 @ V_{GS} = -4.5V	18

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe DPAK saves board space
- Fast switching speed
- High performance trench technology



TO-252



Top View

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C UNLESS OTHERWISE NOTED)

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current[a]	T_A=25°C	I_D	22	A
Pulsed Drain Current[b]		I_{DM}	±72	
Continuous Source Current (Diode Conduction)[a]		I_S	-30	A
Power Dissipation[a]	T_A=25°C	P_D	50	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient[a]	$R_{\theta JA}$	50	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	3.0	°C/W

Notes

a. Surface Mounted on 1” x 1” FR4 Board.

b. Pulse width limited by maximum junction temperature

SPECIFICATIONS ($T_A = 25^oC$ UNLESS OTHERWISE NOTED)

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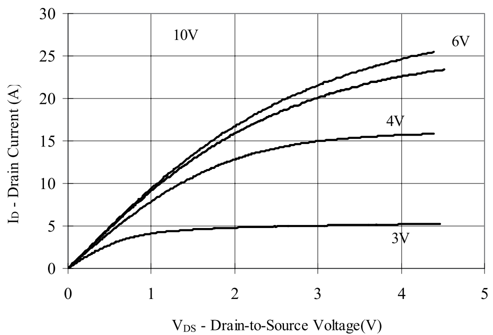
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = -250 uA	-1			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±25 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24 V, V_{GS} = 0 V			-1	uA
		V_{DS} = -24 V, V_{GS} = 0 V, T_J = 55°C			-5	
On-State Drain Current[A]	$I_{D(on)}$	V_{DS} = -5 V, V_{GS} = -10 V	-41			A
Drain-Source On-Resistance[A]	$r_{DS(on)}$	V_{GS} = -10 V, I_D = -22 A			69	mΩ
		V_{GS} = -4.5 V, I_D = -18 A			106	
Forward Tranconductance[A]	g_{fs}	V_{DS} = -15 V, I_D = -22 A		31		S
Diode Forward Voltage	V_{SD}	I_S = -41 A, V_{GS} = 0 V		-0.7		V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = -15 V, V_{GS} = -4.5 V, I_D = -22 A		10		nC
Gate-Source Charge	Q_{gs}			2.2		
Gate-Drain Charge	Q_{gd}			2.5		
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -15 V, R_L = 15 Ω , ID = -24 A, VGEN = -10 V, RG = 6Ω		10		nS
Rise Time	t_r			2.8		
Turn-Off Delay Time	$t_{d(off)}$			53.6		
Fall-Time	t_f			46		

Notes

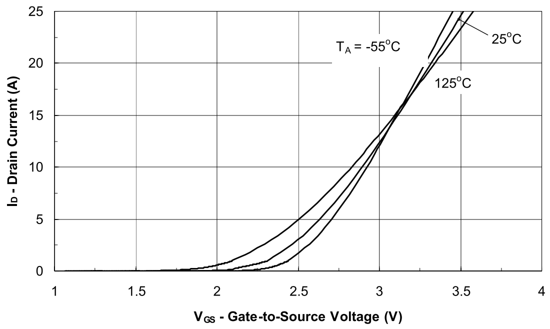
a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

Typical Electrical Characteristics



Output Characteristics



Transfer Characteristics

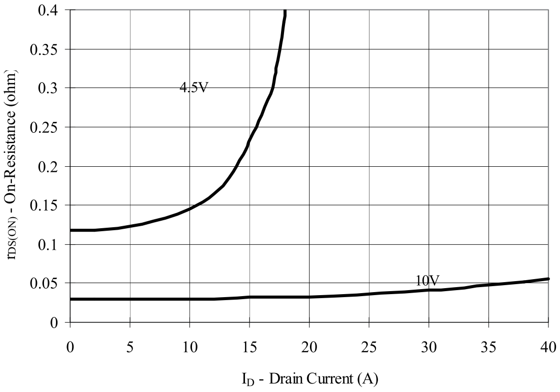
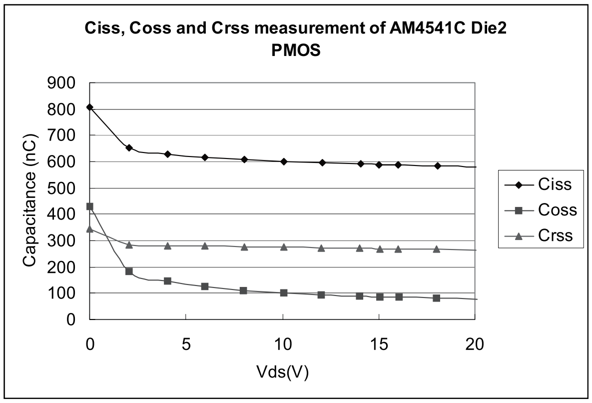
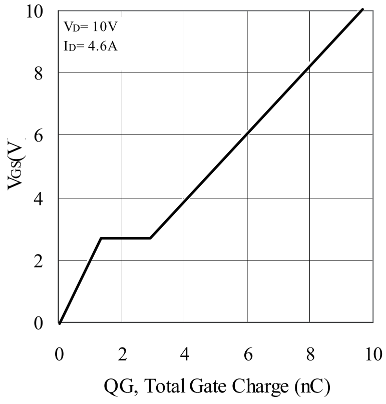


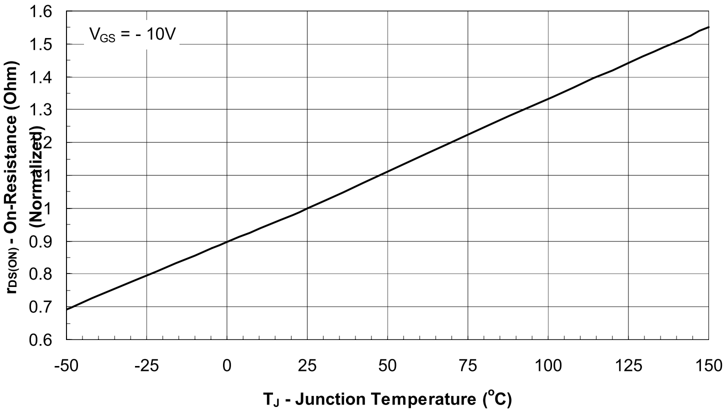
Figure 3. On Resistance Vs Vgs Voltage



Capacitance

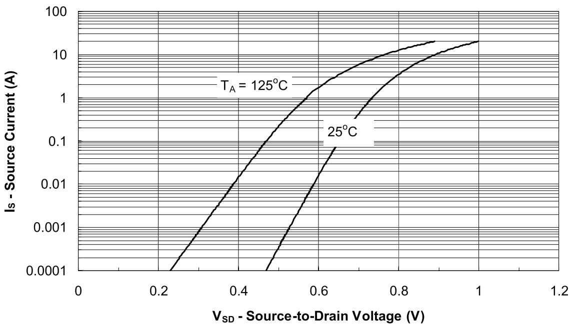


Gate Charge



On-Resistance vs. Junction Temperature

Typical Electrical Characteristics



Source-Drain Diode Forward Voltage

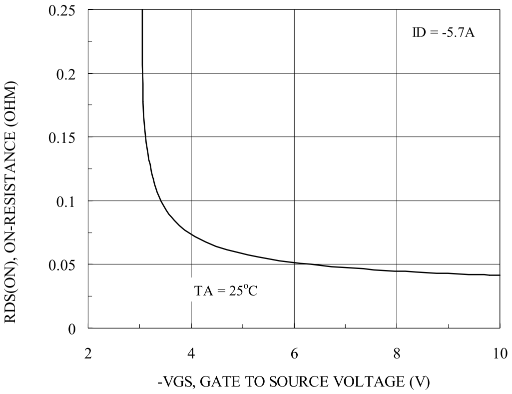
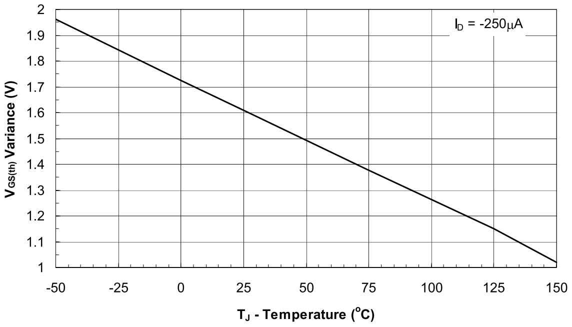


Figure 8. On-Resistance with Gate to Source Voltage



Threshold Voltage

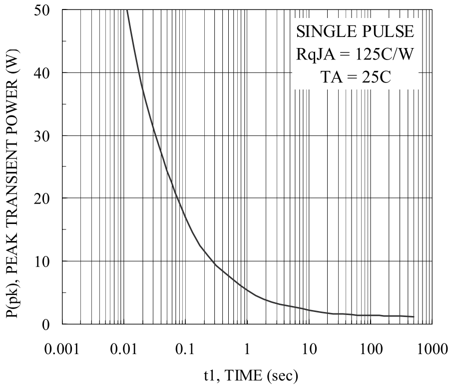


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

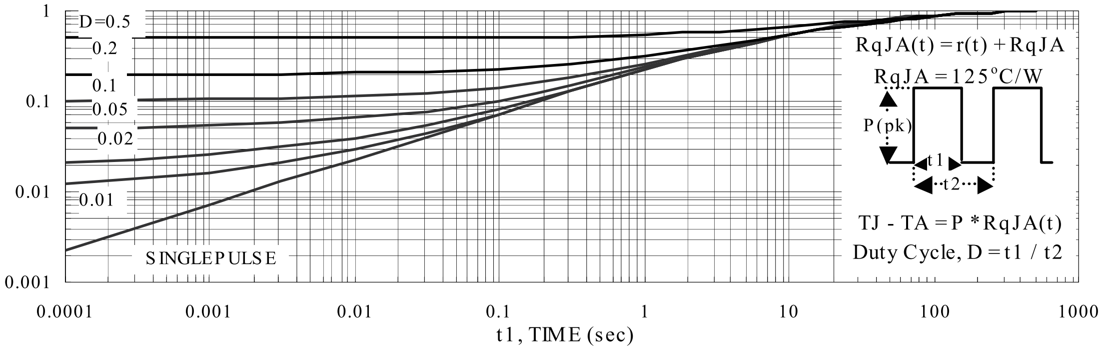


Figure 11. Transient Thermal Response Curve