Preferred Device

Power MOSFET 55 Amps, 60 Volts N-Channel D²PAK

This Power MOSFET is designed to withstand high energy in the avalanche mode and switch efficiently. This high energy device also offers a drain-to-source diode with fast recovery time. Designed for high voltage, high speed switching applications in power supplies, PWM motor controls and other inductive loads, the avalanche energy capability is specified to eliminate the guesswork in designs where inductive loads are switched and offer additional safety margin against unexpected voltage transients.

- Avalanche Energy Capability Specified at Elevated Temperature
- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- Low Stored Gate Charge for Efficient Switching
- Internal Source-to-Drain Diode Designed to Replace External Zener Transient Suppressor-Absorbs High Energy in the Avalanche Mode
- ESD Protected. Designed to Typically Withstand 400 V Machine Model and 4000 V Human Body Model.

MAXIMUM RATINGS (T_J = 25° C unless otherwise noted)

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	VDSS	60	Vdc
Drain-to-Gate Voltage (R_{GS} = 1.0 M Ω)	VDGR	60	Vdc
Gate–to–Source Voltage – Continuous – Non–Repetitive (t _p ≤ 10 ms)	V _{GS} V _{GSM}	±20 ±40	Vdc Vpk
Drain Current – Continuous @ $T_C = 25^{\circ}C$ – Continuous @ $T_C = 100^{\circ}C$ – Single Pulse ($t_p \le 10 \ \mu s$)	ID ID IDM	55 35.5 165	Adc Apk
Total Power Dissipation @ T _C = 25°C Derate above 25°C Total Power Dissipation @ T _A = 25°C (Note NO TAG)	PD	113 0.91 2.5	Watts W/°C
Operating and Storage Temperature Range	TJ, Tstg	– 55 to 150	°C
Single Pulse Drain-to-Source Avalanche Energy – Starting $T_J = 25^{\circ}C$ (VDD = 25 Vdc, VDS = 60 Vdc, VGS = 10 Vdc, Peak I _L = 55 Apk, L = 0.3 mH, RG = 25 Ω)	E _{AS}	454	mJ
Thermal Resistance – Junction to Case – Junction to Ambient – Junction to Ambient (Note NO TAG)	R _θ JC R _θ JC R _θ JA	1.1 62.5 50	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	ΤL	260	°C

 When surface mounted to an FR4 board using the minimum recommended pad size.



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55 AMPERES 60 VOLTS RDS(on) = 18 mΩ





MARKING DIAGRAM & PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping	
MTB55N06Z	D ² PAK	50 Units/Rail	
MTB55N06ZT4	D ² PAK	800/Tape & Reel	

Preferred devices are recommended choices for future use and best overall value.

ELECTRICAL CHARACTERISTICS (T_C = 25° C unless otherwise noted)

OFF CHARACTERISTICS Drain-to-Source Breakdown Voltage (VGg = 0 Vdc, Ip = 250 µAdc) Temperature Coefficient (Positive) V(BR)DSS Zero Gate Voltage Drain Current (VDg = 60 Vdc, VGg = 0 Vdc, TJ = 125°C) IDSS Gate-Body Leakage Current (VGS = ±20 Vdc, VDS = 0 Vdc) IGSS ON CHARACTERISTICS (Note 2.) VGS(Ih) Gate Threshold Voltage (VDS = 60 Vdc, VGS = 0 Vdc), ID = 250 µAdc) Threshold Temperature Coefficient (Negative) VGS(Ih) Static Drain-to-Source On-Resistance (VGS = 10 Vdc, Ip = 27.5 Adc) VDS(on) Drain-to-Source On-Voltage (VGS = 10 Vdc) (Ip = 55 Adc, TJ = 125°C) VDS(on) Forward Transconductance (VDS = 4.0 Vdc, Ip = 27.5 Adc) 9FS DYAMIC CHARACTERISTICS (Note 3.) Ciss Input Capacitance Output Capacitance (VDS = 25 Vdc, VGS = 0 Vdc, I = 1.0 MHz) Ciss SWITCHING CHARACTERISTICS (Note 3.) Ud(on) Id(on) Turm-On Delay Time Rise Time (See Figure 8) (VDS = 48 Vdc, Ip = 55 Adc, VGS = 0 Vdc) Q1 (VDS = 48 Vdc, Ip = 55 Adc, VGS = 0 Vdc) (IS = 55 Adc, VGS = 0 Vdc, TJ = 125°C) Q2 Q3 SOURCE-DRAIN DIODE CHARACTERISTICS VSD Id(a) Q2 (VDS = 48 Vdc, Ip = 55 Adc, VGS = 0 Vdc, VGS = 10 Vdc) VSD Q2 Q3 </th <th>Min</th> <th>Symbol Min</th> <th>Тур</th> <th>Max</th> <th>Unit</th>	Min	Symbol Min	Тур	Max	Unit
Zero Gate Voltage Drain Current (VDS = 60 Vdc, VGS = 0 Vdc) (VDS = 60 Vdc, VGS = 0 Vdc, TJ = 125°C)IDSSGate-Body Leakage Current (VGS = ±20 Vdc, VDS = 0 Vdc)IGSSON CHARACTERISTICS (Note 2.)IGSSGate Threshold Voltage (VDS = VGS, ID = 250 IAdc)(CPk ≥ 2.0)VGS(th)Threshold Temperature Coefficient (Negative)VDS(n)VDS(n)Static Drain-to-Source On-Resistance (VGS = 10 Vdc, ID = 27.5 Adc)VDS(n)VDS(n)Drain-to-Source On-Voltage (VGS = 10 Vdc) (ID = 55 Adc, TJ = 125°C)VDS(n)VDS(n)Forward Transconductance (VDS = 4.0 Vdc, ID = 27.5 Adc)GFSCossDVNMIC CHARACTERISTICS(VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz)CissCossOutput Capacitance(VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz)CissCossTransfer Capacitance(VDD = 30 Vdc, ID = 55 Adc, VGS(n) = 10 Vdc, RG = 9.1 Ω)tdtrTurn-On Delay Time(VDS = 48 Vdc, ID = 55 Adc, VGS (D) = 10 Vdc)Q1Q2Gate Charge (See Figure 8)(VDS = 48 Vdc, ID = 55 Adc, VGS = 0 Vdc)Q1Q2Q3SOURCE-DRAIN DIODE CHARACTERISTICSVSDVSDItrForward On-Voltage(IS = 55 Adc, VGS = 0 Vdc) (IS = 55 Adc, VGS = 0 Vdc, dIg/dt = 100 A/µS)VSDItrReverse Recovery Time(IS = 55 Adc, VGS = 0 Vdc, dIg/dt = 100 A/µS)UVSDQRRReverse Recovery Stored ChargeQRRItrItrINTERNAL PACKAGE INDUCTANCEInternal Drain Inductance (Measured from drain lead 0.25" from package to center of die)LD	60	60	- 53	-	Vdc mV/°C
			55	_	
DN CHARACTERISTICS (Note 2.) VGS(th) Gate Threshold Voltage (VDS = VGS, Ip = 250 µAdc) Threshold Temperature Coefficient (Negative) VGS(th) Static Drain-to-Source On-Resistance (VDS = 10 Vdc, Ip = 27.5 Adc) RDS(on) Drain-to-Source On-Voltage (VGS = 10 Vdc) (Ip = 55 Adc) (Ip = 55 Adc) VDS(on) Forward Transconductance (VDS = 4.0 Vdc, Ip = 27.5 Adc) 9FS DYNAMIC CHARACTERISTICS (VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz) Ciss Tarnsfer Capacitance (VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz) Ciss SWITCHING CHARACTERISTICS Input Capacitance (VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz) td(on) Turm-On Delay Time (VDD = 30 Vdc, Ip = 55 Adc, VGS(on) = 10 Vdc, RG = 9.1 Ω) td(off) Fail Time (VDS = 48 Vdc, ID = 55 Adc, VGS = 10 Vdc) QT Gate Charge (See Figure 8) (VDS = 48 Vdc, ID = 55 Adc, VGS = 10 Vdc) Q1 SOURCE-DRAIN DIODE CHARACTERISTICS VSD Q3 Forward On-Voltage (IS = 55 Adc, VGS = 0 Vdc, dIS/dt = 100 A/µs) VSD Reverse Recovery Time (IS = 55 Adc, VGS = 0 Vdc, dIS/dt = 100 A/µs) VSD Reverse Recovery Stored Charge (IS = 55 Adc, VGS = 0 Vdc, dIS/dt = 100 A/µs) VB NTERNAL PACKAGE INDUCTANCE LD LD	-	^I DSS – –		1.0 10	μAdc
DN CHARACTERISTICS (Note 2.) VGS(th) Gate Threshold Voltage (VDS = VGS, Ip = 250 µAdc) Threshold Temperature Coefficient (Negative) VGS(th) Static Drain-to-Source On-Resistance (VDS = 10 Vdc, Ip = 27.5 Adc) RDS(on) Drain-to-Source On-Voltage (VGS = 10 Vdc) (Ip = 55 Adc) (Ip = 55 Adc) VDS(on) Forward Transconductance (VDS = 4.0 Vdc, Ip = 27.5 Adc) 9FS DYNAMIC CHARACTERISTICS (VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz) Ciss Tarnsfer Capacitance (VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz) Ciss SWITCHING CHARACTERISTICS Input Capacitance (VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz) td(on) Turm-On Delay Time (VDD = 30 Vdc, Ip = 55 Adc, VGS(on) = 10 Vdc, RG = 9.1 Ω) td(off) Fail Time (VDS = 48 Vdc, ID = 55 Adc, VGS = 10 Vdc) QT Gate Charge (See Figure 8) (VDS = 48 Vdc, ID = 55 Adc, VGS = 10 Vdc) Q1 SOURCE-DRAIN DIODE CHARACTERISTICS VSD Q3 Forward On-Voltage (IS = 55 Adc, VGS = 0 Vdc, dIS/dt = 100 A/µs) VSD Reverse Recovery Time (IS = 55 Adc, VGS = 0 Vdc, dIS/dt = 100 A/µs) VSD Reverse Recovery Stored Charge (IS = 55 Adc, VGS = 0 Vdc, dIS/dt = 100 A/µs) VB NTERNAL PACKAGE INDUCTANCE LD LD	_	IGSS -	-	100	nAdc
Gate Threshold Voltage (VDS = VGS. ID = 250 µAdc) Threshold Temperature Coefficient (Negative)VGS(th)VGS(th)Static Drain-to-Source On-Resistance (VQS = 10 Vdc, ID = 27.5 Adc)(Cpk ≥ 2.0) (ID = 55 Adc, C)RDS(on)Drain-to-Source On-Voltage (VGS = 10 Vdc) (ID = 55 Adc, C) (ID = 55 Adc, C)VDS(on)VDS(on)Input Capacitance Output Capacitance(VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz)Ciss CossTransfer Capacitance Output Capacitance(VDS = 25 Vdc, VGS = 0 Vdc, f = 1.0 MHz)Ciss CossTurm-On Delay Time Rise Time(VDD = 30 Vdc, ID = 55 Adc, VGS(on) = 10 Vdc, RG = 9.1 Ω)td(on)Fall Time Gate Charge (See Figure 8)(VDS = 48 Vdc, ID = 55 Adc, VGS = 10 Vdc)Q1Cource-DRAIN DIODE CHARACTERISTICS(VDS = 48 Vdc, ID = 55 Adc, VGS = 0 Vdc, IG = 55 Adc, VGS = 0 Vdc, US = 55 Ad		000			
$(V_{GS} = 10 Vdc, I_{D} = 27.5 Adc)$ $V_{DS}(on)$ Drain-to-Source On-Voltage (V_{GS} = 10 Vdc) (I_{D} = 55 Adc, T_{J} = 125°C) $V_{DS}(on)$ Forward Transconductance (V_{DS} = 4.0 Vdc, I_{D} = 27.5 Adc) g_{FS} DVNAMIC CHARACTERISTICSInput Capacitance C_{ISS} Input Capacitance $(V_{DS} = 25 Vdc, V_{GS} = 0 Vdc, f = 1.0 MHz)$ C_{ISS} Transfer Capacitance $(V_{DD} = 30 Vdc, I_{D} = 55 Adc, V_{GS} = 0 Vdc, G_{SS} = 1.0 MHz)$ $t_{d}(on)$ Turn-On Delay Time $(V_{DD} = 30 Vdc, I_{D} = 55 Adc, V_{GS} = 0 Vdc, G_{S} = 9.1 \Omega)$ $t_{d}(off)$ Fail Time $(V_{DS} = 48 Vdc, I_{D} = 55 Adc, V_{GS} = 10 Vdc)$ t_{f} Gate Charge (See Figure 8) $(V_{DS} = 48 Vdc, I_{D} = 55 Adc, V_{GS} = 10 Vdc)$ Q_2 Q_3 Q_1 Q_2 Q_3 SOURCE-DRAIN DIODE CHARACTERISTICS $V_{GS} = 0 Vdc, T_{J} = 125°C)$ V_{SD} Reverse Recovery Time $(I_{S} = 55 Adc, V_{GS} = 0 Vdc, T_{J} = 125°C)$ V_{SD} Reverse Recovery Stored Charge $(I_{S} = 55 Adc, V_{GS} = 0 Vdc, T_{J} = 125°C)$ V_{SD} Reverse Recovery Stored Charge Q_{RR} U_{RR} Internal Drain Inductance (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25″ from package to center of die) L_{D}	2.0		3.0 6.0	4.0	Vdc mV/°C
(ID = 55 Adc) (ID = 27.5 Adc, TJ = 125°C)SectorForward Transconductance (VDS = 4.0 Vdc, ID = 27.5 Adc) g_{FS} DYNAMIC CHARACTERISTICSInput Capacitance $(VDS = 25 Vdc, VGS = 0 Vdc, ID = 27.5 Adc)$ Output Capacitance $(VDS = 25 Vdc, VGS = 0 Vdc, ID = 27.5 Adc)$ C_{iss} Output Capacitance $(VDS = 25 Vdc, VGS = 0 Vdc, ID = 27.5 Adc)$ C_{iss} Transfer Capacitance $(VDS = 25 Vdc, VGS = 0 Vdc, ID = 27.5 Adc)$ C_{iss} SWITCHING CHARACTERISTICS (Note 3.) C_{rss} C_{rss} Turn-On Delay Time $(VDD = 30 Vdc, ID = 55 Adc, VGS(0n) = 10 Vdc, RG = 9.1 \Omega)$ t_f Fall Time $(VDS = 48 Vdc, ID = 55 Adc, VGS = 0 Vdc)$ Q_T Gate Charge (See Figure 8) $(VDS = 48 Vdc, ID = 55 Adc, VGS = 0 Vdc)$ Q_1 SOURCE-DRAIN DIODE CHARACTERISTICS Q_2 Q_3 SOURCE-DRAIN DIODE CHARACTERISTICS VSD VSD Reverse Recovery Time $(IS = 55 Adc, VGS = 0 Vdc, TJ = 125°C)$ VSD Reverse Recovery Time $(IS = 55 Adc, VGS = 0 Vdc, dIS/dt = 100 A/\muS)$ QRR NTERNAL PACKAGE INDUCTANCE QRR QRR Internal Drain Inductance (Measured from contact screw on tab to center of die) LD	_		14	18	mΩ
DYNAMIC CHARACTERISTICSInput Capacitance $(V_{DS} = 25 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, f = 1.0 \text{ MHz})$ C_{iss} Output Capacitance $(V_{DS} = 25 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, f = 1.0 \text{ MHz})$ C_{iss} Transfer Capacitance $(V_{DS} = 25 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, f = 1.0 \text{ MHz})$ C_{iss} SWITCHING CHARACTERISTICS (Note 3.) $Turn-On Delay Time$ $(V_{DD} = 30 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS}(on) = 10 \text{ Vdc}, R_G = 9.1 \Omega)$ $td(on)$ Rise Time $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_T Q_T Gate Charge (See Figure 8) $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_1 Q_2 Q_3 Q_3 Q_1 SOURCE-DRAIN DIODE CHARACTERISTICS Q_2 Q_3 Forward On-Voltage $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A}/\mu_S)$ t_{rr} $I_{S} = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A}/\mu_S)$ Q_{RR} Reverse Recovery Time $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A}/\mu_S)$ Q_RR Internal Drain Inductance (Measured from contact screw on tab to center of die) L_D	- -	-	0.825 0.74	1.2 1.0	Vdc
Input Capacitance $(V_{DS} = 25 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, f = 1.0 \text{ MHz})$ C_{iss} Output Capacitance $(V_{DS} = 25 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, f = 1.0 \text{ MHz})$ C_{oss} SWITCHING CHARACTERISTICS (Note 3.)Turn-On Delay Time $(V_{DD} = 30 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS}(on) = 10 \text{ Vdc}, R_G = 9.1 \Omega)$ $td(on)$ Rise Time $(V_{DD} = 30 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS}(on) = 10 \text{ Vdc}, R_G = 9.1 \Omega)$ tf $td(off)$ Fall Time $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_T Q_1 Gate Charge (See Figure 8) $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_1 Q_2 Q3SOURCE-DRAIN DIODE CHARACTERISTICS Q_1 Q_2 Q_3 Forward On-Voltage $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A/}\mu_S)$ V_SD tr Reverse Recovery Time $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A/}\mu_S)$ Q_RR TERNAL PACKAGE INDUCTANCEInternal Drain Inductance (Measured from contact screw on tab to center of die) L_D	12	9FS 12	15	-	Mhos
Output Capacitance $(V_{DS} = 25 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, f = 1.0 \text{ MHz})$ C_{oss} Transfer Capacitance $(V_{DS} = 25 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, f = 1.0 \text{ MHz})$ C_{oss} C_{rss} SWITCHING CHARACTERISTICS (Note 3.)Turn-On Delay Time $(V_{DD} = 30 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS}(on) = 10 \text{ Vdc}, R_G = 9.1 \Omega)$ $t_d(on)$ Fail Time $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_T Gate Charge (See Figure 8) $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_1 Forward On-Voltage $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc})$ Q_2 Reverse Recovery Time $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A/}\mu s)$ t_r Reverse Recovery Stored Charge $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A/}\mu s)$ t_B Internal Drain Inductance (Measured from contact screw on tab to center of die) L_D L_D		·			
Compute Capacitancef = 1.0 MHz)CossTransfer Capacitance C_{rss} SWITCHING CHARACTERISTICS (Note 3.)Turm-On Delay Time $(V_{DD} = 30 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS}(on) = 10 \text{ Vdc}, R_G = 9.1 \Omega)$ $td(on)$ Rise Time $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ tf Fall Time Q_T $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_2 Gate Charge (See Figure 8) Q_T Q_2 Q_3 Q_3 Q_3 SOURCE-DRAIN DIODE CHARACTERISTICS V_{SD} Q_2 Forward On-Voltage $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}) (I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A/}\mus)$ V_SD Reverse Recovery Time $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A/}\mus)$ t_r Reverse Recovery Stored Charge Q_RR t_D Internal Drain Inductance (Measured from contact screw on tab to center of die) L_D	-	C _{iss} –	1390	1950	pF
Transfer CapacitanceCrssCrssSWITCHING CHARACTERISTICS (Note 3.)Turn-On Delay TimeRise Time $(V_{DD} = 30 Vdc, I_D = 55 Adc, VGS(on) = 10 Vdc, RG = 9.1 \Omega)$ Fall Time $(V_{DS} = 48 Vdc, I_D = 55 Adc, VGS = 0.1 \Omega)$ Gate Charge (See Figure 8) $(V_{DS} = 48 Vdc, I_D = 55 Adc, VGS = 0.1 Vdc)$ Forward On-Voltage $(I_S = 55 Adc, V_GS = 0 Vdc)$ $(I_S = 55 Adc, V_GS = 0 Vdc, dI_S/dt = 100 A/\mus)$ Reverse Recovery Time $(I_S = 55 Adc, V_GS = 0 Vdc, dI_S/dt = 100 A/\mus)$ Reverse Recovery Stored Charge $(I_S = 55 Adc, V_GS = 0 Vdc, dI_S/dt = 100 A/\mus)$ NTERNAL PACKAGE INDUCTANCE L_D (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die)	_	C _{OSS} –	520	730	-
SWITCHING CHARACTERISTICS (Note 3.)Turm-On Delay Time $(V_{DD} = 30 \ Vdc, \ I_D = 55 \ Adc, \ V_{GS}(on) = 10 \ Vdc, \ R_G = 9.1 \ \Omega)$ $td(on)$ Fall Time $(V_{DS} = 30 \ Vdc, \ I_D = 55 \ Adc, \ V_{GS}(on) = 10 \ Vdc, \ R_G = 9.1 \ \Omega)$ tr Gate Charge (See Figure 8) $(V_{DS} = 48 \ Vdc, \ I_D = 55 \ Adc, \ V_{GS} = 10 \ Vdc)$ Q_T Gate Charge (See Figure 8) Q_T Q_T Gate Charge (See Figure 8) $(V_{DS} = 48 \ Vdc, \ I_D = 55 \ Adc, \ V_{GS} = 10 \ Vdc)$ Q_1 Q_2 Q_3 Q_3 SOURCE-DRAIN DIODE CHARACTERISTICS V_{SD} Q_1 Forward On-Voltage $(I_S = 55 \ Adc, \ V_{GS} = 0 \ Vdc) \ (I_S = 55 \ Adc, \ V_{GS} = 0 \ Vdc, \ dI_S/dt = 100 \ A/\mu s)$ V_{SD} Reverse Recovery Time $(I_S = 55 \ Adc, \ V_{GS} = 0 \ Vdc, \ dI_S/dt = 100 \ A/\mu s)$ $trrReverse Recovery Stored Charge(I_S = 55 \ Adc, \ V_{GS} = 0 \ Vdc, \ dI_S/dt = 100 \ A/\mu s)U_DNTERNAL PACKAGE INDUCTANCEL_DInternal Drain Inductance(Measured from contact screw on tab to center of die)L_D$	_		119	238	-
Rise Time $(V_{DD} = 30 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS(on)} = 10 \text{ Vdc}, R_G = 9.1 \Omega)$ t_r Fall Time $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 9.1 \Omega)$ t_f Gate Charge (See Figure 8) $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_T Q_2 Q_3 Q_2 GOURCE-DRAIN DIODE CHARACTERISTICS Q_2 Forward On-Voltage $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc})$ $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, T_J = 125^\circ C)$ V_{SD} Reverse Recovery Time $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A/}\mu \text{s})$ t_{rr} Reverse Recovery Stored Charge Q_{RR} t_{D} Internal Drain Inductance (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die) L_D		l	1	1	1
Turn-Off Delay Time $V_{GS}(on) = 10 \text{ Vdc},$ $R_G = 9.1 \Omega)$ t_q Fall Time t_f Gate Charge (See Figure 8) Q_T $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc},$ $V_{GS} = 10 \text{ Vdc})$ Q_1 Q_2 Q_3 SOURCE-DRAIN DIODE CHARACTERISTICSForward On-Voltage $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc})$ $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc})$ $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}),$ $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}),$ $dI_S/dt = 100 \text{ A/}\mu\text{s})$ V_{SD} Reverse Recovery Time(I_S = 55 Adc, V_{GS} = 0 \text{ Vdc}, $dI_S/dt = 100 \text{ A/}\mu\text{s})$ INTERNAL PACKAGE INDUCTANCEInternal Drain Inductance (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die)	-	t _{d(on)} –	27	54	ns
$\begin{array}{ c c c c c c } \hline R_G \doteq 9.1 \ \Omega \end{pmatrix} & \hline t_d(off) \\ \hline Fall Time & & & & & & & & \\ \hline Fall Time & & & & & & & \\ \hline Gate Charge \\ (See Figure 8) & & & & & & & & \\ (V_{DS} = 48 \ Vdc, \ I_D = 55 \ Adc, \\ V_{GS} = 10 \ Vdc) & & & & & \\ \hline Q_1 & & & & & \\ \hline Q_2 & & & & & \\ \hline Q_3 & & & & & \\ \hline Q_3 & & & & & \\ \hline SOURCE-DRAIN DIODE CHARACTERISTICS & & & & \\ \hline SOURCE-DRAIN DIODE CHARACTERISTICS & & & & & \\ \hline Forward On-Voltage & & & & & & & \\ (I_S = 55 \ Adc, \ V_{GS} = 0 \ Vdc) & & & & & \\ (I_S = 55 \ Adc, \ V_{GS} = 0 \ Vdc, \ I_S = 55 \ Adc, \ V_{GS} = 0 \ Vdc, \ dI_S/dt = 100 \ A/\mu s) & & & & \\ \hline Reverse \ Recovery \ Time & & & & & \\ \hline Reverse \ Recovery \ Stored \ Charge & & & & \\ \hline Reverse \ Recovery \ Stored \ Charge & & & & \\ \hline NTERNAL \ PACKAGE \ INDUCTANCE & & & \\ \hline Internal \ Drain \ Inductance \ (Measured from contact screw on tab to center of die) \ (Measured from drain \ Iead \ 0.25'' \ from package to center of \ die) & & \\ \hline \end{array}$	_	t _r –	157	314	
Fall TimetfGate Charge (See Figure 8) Q_T $(V_{DS} = 48 \text{ Vdc}, I_D = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_1 Q_2 Q_3 SOURCE-DRAIN DIODE CHARACTERISTICSForward On-Voltage $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc})$ $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, T_J = 125^{\circ}C)$ Reverse Recovery Time t_{rr} $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, T_J = 125^{\circ}C)$ Reverse Recovery Stored Charge $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, T_J = 125^{\circ}C)$ Reverse Recovery Stored Charge t_{B} NTERNAL PACKAGE INDUCTANCE Q_{RR} Internal Drain Inductance (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die)	_	td(off) -	116	232	
$(See Figure 8)$ $(V_{DS} = 48 \text{ Vdc}, I_{D} = 55 \text{ Adc}, V_{GS} = 10 \text{ Vdc})$ Q_{1} Q_{2} Q_{3} SOURCE-DRAIN DIODE CHARACTERISTICS Forward On-Voltage $(I_{S} = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}) (I_{S} = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}) (I_{S} = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, T_{J} = 125^{\circ}\text{C})$ Reverse Recovery Time $(I_{S} = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_{S}/dt = 100 \text{ A/}\mu\text{s})$ $\frac{t_{rr}}{t_{a}}$ Reverse Recovery Stored Charge NTERNAL PACKAGE INDUCTANCE Internal Drain Inductance (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die) (Measured from drain lead 0.25" from package to center of die)	-		126	252	
$ \begin{array}{ c c c c } & (V_{DS} = 48 \text{ Vdc}, I_{D} = 55 \text{ Adc}, \\ & V_{GS} = 10 \text{ Vdc} \end{pmatrix} & \begin{array}{ c c c } & Q_1 \\ \hline & Q_2 \\ \hline & Q_3 \\ \hline \\ $	-	Q _T –	40	56	nC
$V_{GS} = 10 \text{ Vdc}) \qquad $	_	Q ₁ –	7.0	-	
SOURCE–DRAIN DIODE CHARACTERISTICS Forward On–Voltage $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc})$ VSD Reverse Recovery Time $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, T_J = 125^{\circ}C)$ t_{rr} Reverse Recovery Time $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A/}\mu s)$ t_{b} Reverse Recovery Stored Charge $u_{IS}/dt = 100 \text{ A/}\mu s$ Q_{RR} NTERNAL PACKAGE INDUCTANCE Internal Drain Inductance (Measured from contact screw on tab to center of die) L_D (Measured from drain lead 0.25" from package to center of die) L_D	_	Q ₂ –	18	-	
Forward On–Voltage $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc})$ V_{SD} Reverse Recovery Time $I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, T_J = 125^{\circ}C)$ t_{rr} Reverse Recovery Time $(I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, dI_S/dt = 100 \text{ A/}\mu s)$ t_a Reverse Recovery Stored Charge $u_S/dt = 100 \text{ A/}\mu s$ Q_{RR} INTERNAL PACKAGE INDUCTANCE U_D L_D Internal Drain Inductance (Measured from contact screw on tab to center of die) L_D	_	Q3 -	15	-	1
$\begin{array}{ c c c c } \hline (IS = 55 \ Adc, \ VGS = 0 \ Vdc) \\ \hline (IS = 55 \ Adc, \ VGS = 0 \ Vdc, \ T_J = 125^{\circ}C) \\ \hline \\ $		l	1	1	
$\begin{array}{c c} & t_a \\ \hline \\ (I_S = 55 \text{ Adc}, V_{GS} = 0 \text{ Vdc}, \\ dI_S/dt = 100 \text{ A}/\mu \text{s}) \\ \hline \\ \hline \\ \hline \\ Q_{RR} \\ \hline \\ $	-		0.93 0.82	1.1	Vdc
Reverse Recovery Stored Charge (IS = 55 Adc, VGS = 0 Vdc, dIS/dt = 100 A/μs) tb NTERNAL PACKAGE INDUCTANCE Internal Drain Inductance (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die) LD	-	t _{rr} –	57	-	ns
dlg/dt = 100 Å/µs) tb Reverse Recovery Stored Charge QRR NTERNAL PACKAGE INDUCTANCE Internal Drain Inductance (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die)	_	t _a –	32	-	-
Reverse Recovery Stored Charge QRR NTERNAL PACKAGE INDUCTANCE Internal Drain Inductance (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die) LD	_	t _b –	25	-	
Internal Drain Inductance LD (Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die)	-	Q _{RR} –	0.11	-	μC
(Measured from contact screw on tab to center of die) (Measured from drain lead 0.25" from package to center of die)					
Internal Source Inductance	-	L _D	3.5 4.5		nH
(Measured from the source lead 0.25" from package to source bond pad)	_	L _S	7.5	_	1

Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
 Switching characteristics are independent of operating junction temperature.









PACKAGE DIMENSIONS

D²PAK CASE 418B-03 ISSUE D



NOTES: 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. 2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
Α	0.340	0.380	8.64	9.65
В	0.380	0.405	9.65	10.29
С	0.160	0.190	4.06	4.83
D	0.020	0.035	0.51	0.89
Е	0.045	0.055	1.14	1.40
G	0.100 BSC		2.54 BSC	
Η	0.080	0.110	2.03	2.79
ſ	0.018	0.025	0.46	0.64
Κ	0.090	0.110	2.29	2.79
S	0.575	0.625	14.60	15.88
<	0.045	0.055	1.14	1.40

STYLE 2: PIN 1. GATE 2. DRAIN 3. SOURCE 4. DRAIN

<u>Notes</u>

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