

Product Summary

Device	V _{(BR)DSS}	R _{DS(ON)}	I _D
N-Channel	30V	0.135Ω	2.3A
P-Channel	-30V	0.185Ω	-2.0A

Description

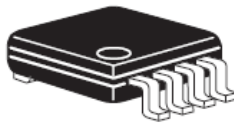
This new generation of high density MOSFETs from Diodes Incorporated utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

Features

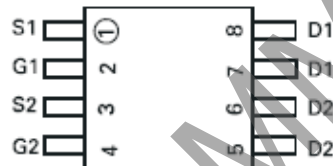
- Low On-resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Low Profile SOIC Package

Applications

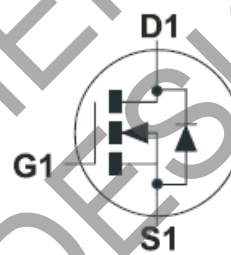
- DC - DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control



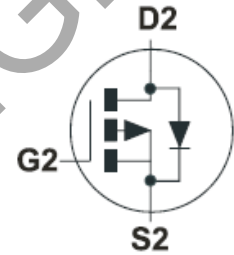
MSOP8



Pin-Out
Top View



N-channel



P-channel

Ordering Information

Part Number	Device Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
ZXMD63C03XTA	ZXM63C03	7	12mm Embossed	1000 Units
ZXMD63C03XTC	ZXM63C03	13	12mm Embossed	4000 Units

Maximum Ratings

PARAMETER	SYMBOL	N-CHANNEL	P-CHANNEL	UNIT
Drain-Source Voltage	V_{DSS}	30	-30	V
Gate- Source Voltage	V_{GS}	± 20		V
Continuous Drain Current ($V_{GS}=4.5V$; $T_A=25^\circ C$)(b)(d) ($V_{GS}=4.5V$; $T_A=70^\circ C$)(b)(d)	I_D	2.3	-2.0	A
		1.8	-1.6	A
Pulsed Drain Current (c)(d)	I_{DM}	14	-9.6	A
Continuous Source Current (Body Diode)(b)(d)	I_S	1.5	-1.4	A
Pulsed Source Current (Body Diode)(c)(d)	I_{SM}	14	-9.6	A
Power Dissipation at $T_A=25^\circ C$ (a)(d) Linear Derating Factor	P_D	0.87 6.9		W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (a)(e) Linear Derating Factor	P_D	1.04 8.3		W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b)(d) Linear Derating Factor	P_D	1.25 10		W mW/ $^\circ C$
Operating and Storage Temperature Range	$T_J:T_{stg}$	-55 to +150		$^\circ C$

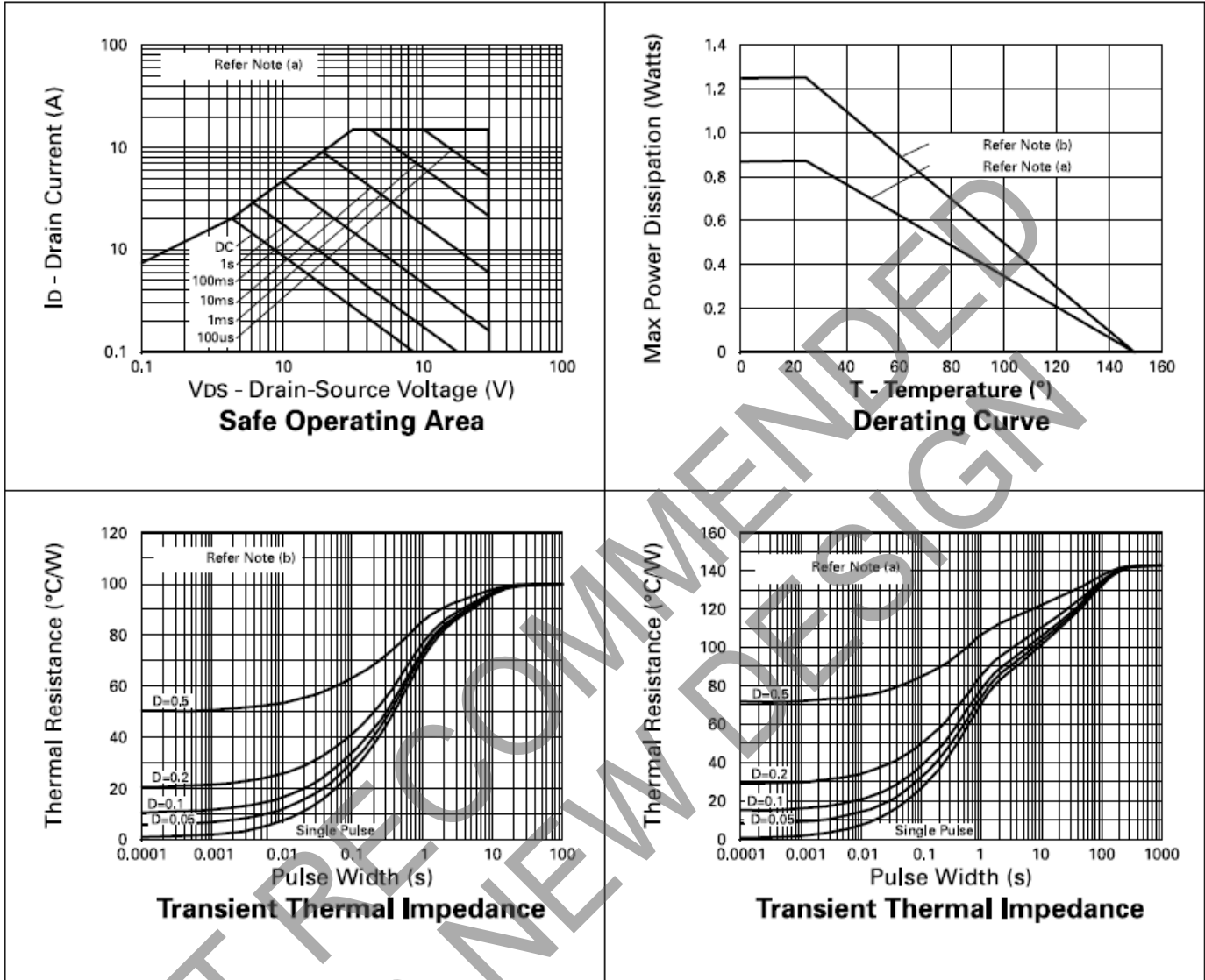
Thermal Characteristics

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)(d)	$R_{\theta JA}$	143	$^\circ C/W$
Junction to Ambient (b)(d)	$R_{\theta JA}$	100	$^\circ C/W$
Junction to Ambient (a)(e)	$R_{\theta JA}$	120	$^\circ C/W$

NOTES:

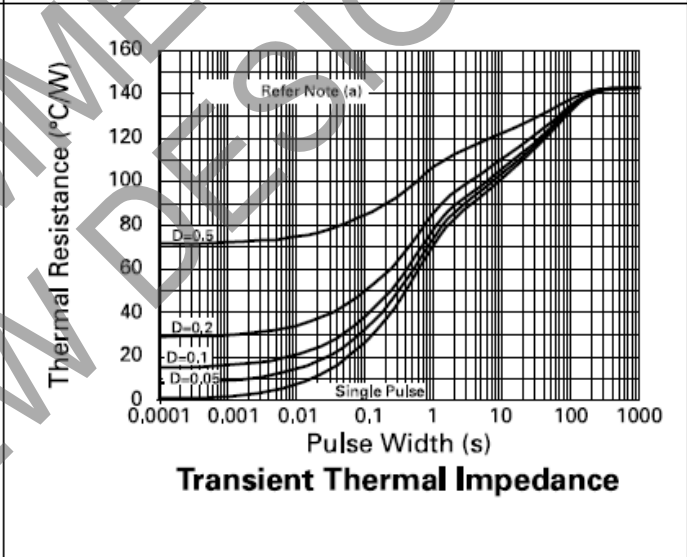
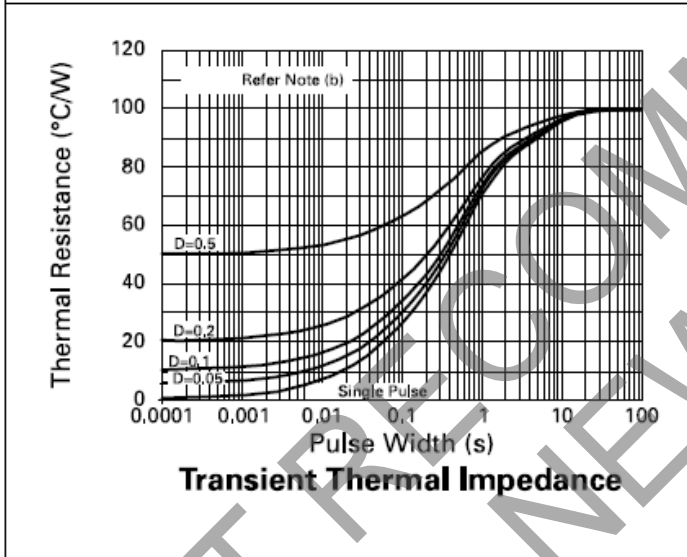
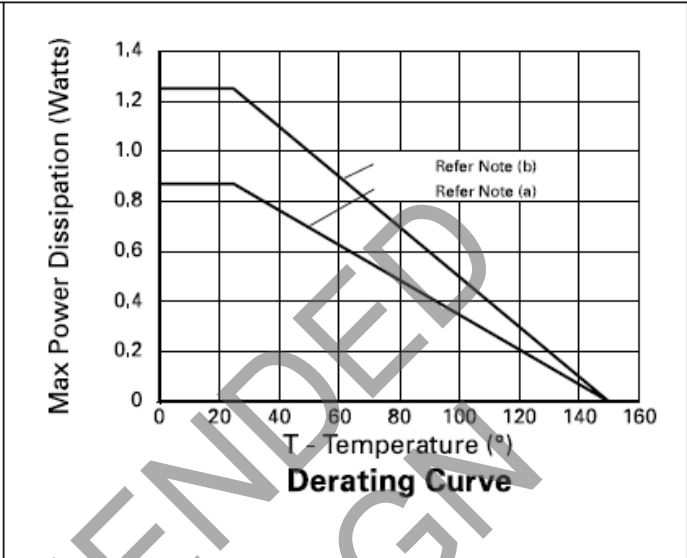
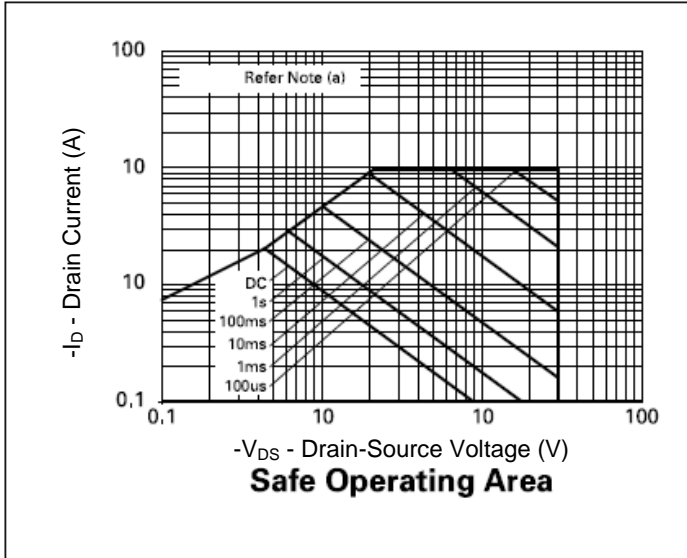
- (a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions
- (b) For a device surface mounted on FR4 PCB measured at $t \leq 10$ secs.
- (c) Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
- (d) For device with one active die.
- (e) For device with two active die running at equal power.

N-Channel Characteristics



NOT RECOMMENDED FOR NEW DESIGN

P-Channel Characteristics



NOT FOR NEW DESIGN

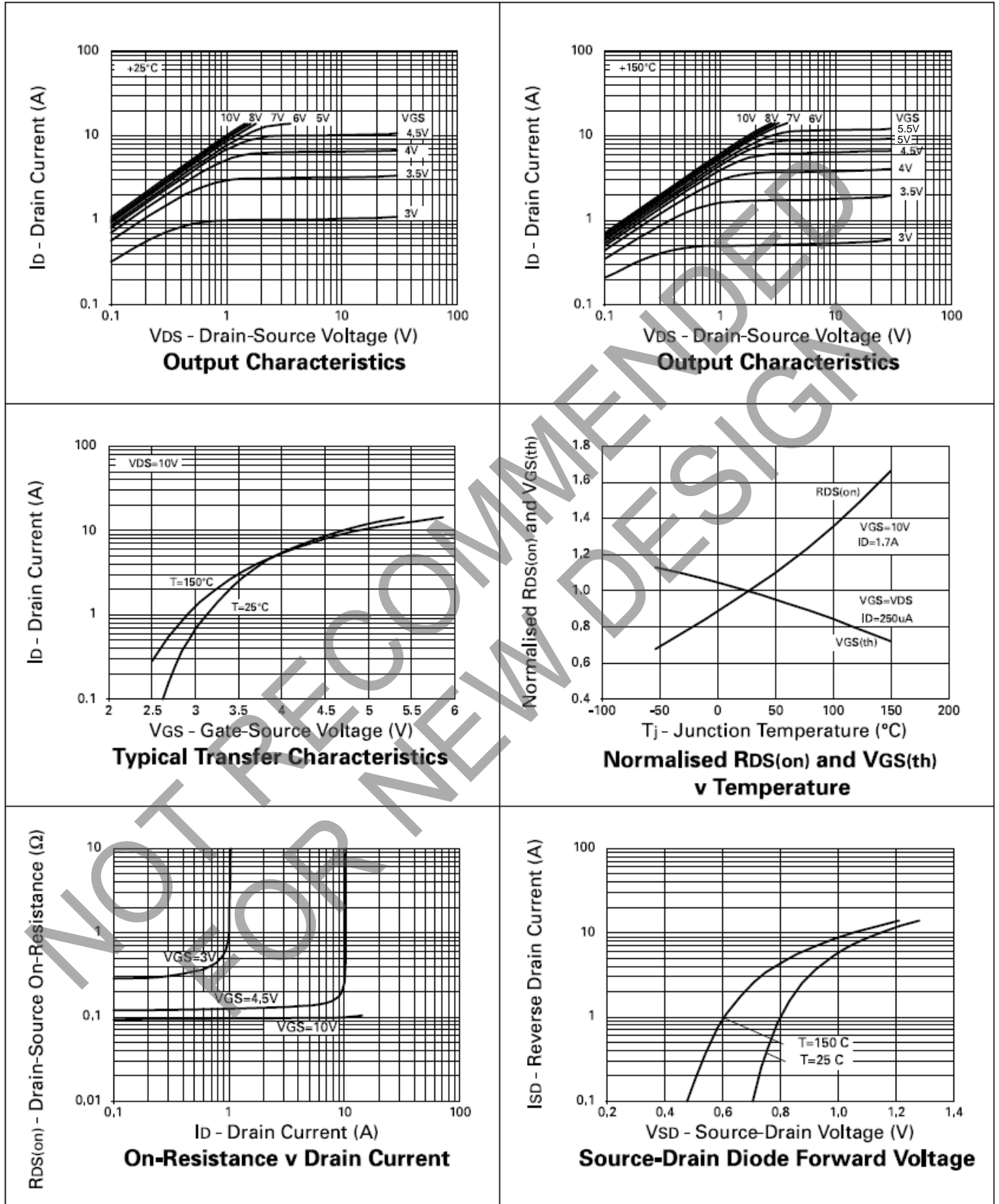
Electrical Characteristics – N-Channel (@T_A = +25°C, unless otherwise specified.)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	30			V	I _D =250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			1	μA	V _{DS} =30V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =± 20V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	1.0			V	I _D =250μA, V _{DS} =V _{GS}
Static Drain-Source On-State Resistance (1)	R _{DS(on)}			0.135 0.200	Ω	V _{GS} =10V, I _D =1.7A V _{GS} =4.5V, I _D =0.85A
Forward Transconductance (3)	g _{fs}	1.9			S	V _{DS} =10V, I _D =0.85A
DYNAMIC (3)						
Input Capacitance	C _{iss}		290		pF	V _{DS} =25V, V _{GS} =0V, f=1MHz
Output Capacitance	C _{oss}		70		pF	
Reverse Transfer Capacitance	C _{rss}		20		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	t _{d(on)}		2.5		ns	V _{DD} = 15V, I _D =1.7A R _G =6.1Ω, R _D =8.7Ω (Refer to test circuit)
Rise Time	t _r		4.1		ns	
Turn-Off Delay Time	t _{d(off)}		9.6		ns	
Fall Time	t _f		4.4		ns	
Total Gate Charge	Q _g			8	nC	V _{DS} =24V, V _{GS} =10V, I _D =1.7A (Refer to test circuit)
Gate-Source Charge	Q _{gs}			1.2	nC	
Gate Drain Charge	Q _{gd}			2	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V _{SD}			0.95	V	T _J =25°C, I _S =1.7A, V _{GS} =0V
Reverse Recovery Time (3)	t _{rr}		16.9		ns	T _J =25°C, I _F =1.7A, di/dt= 100A/μs
Reverse Recovery Charge(3)	Q _{rr}		9.5		nC	

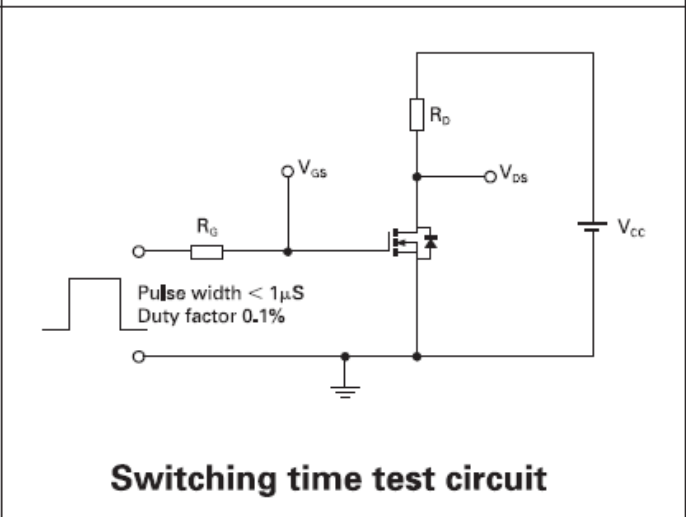
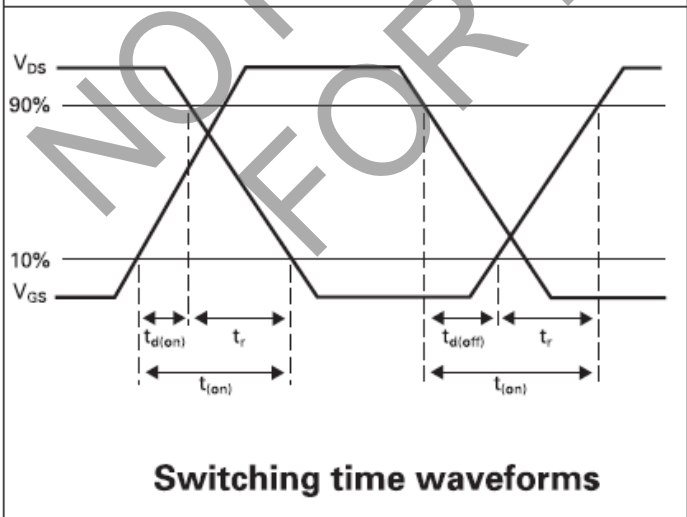
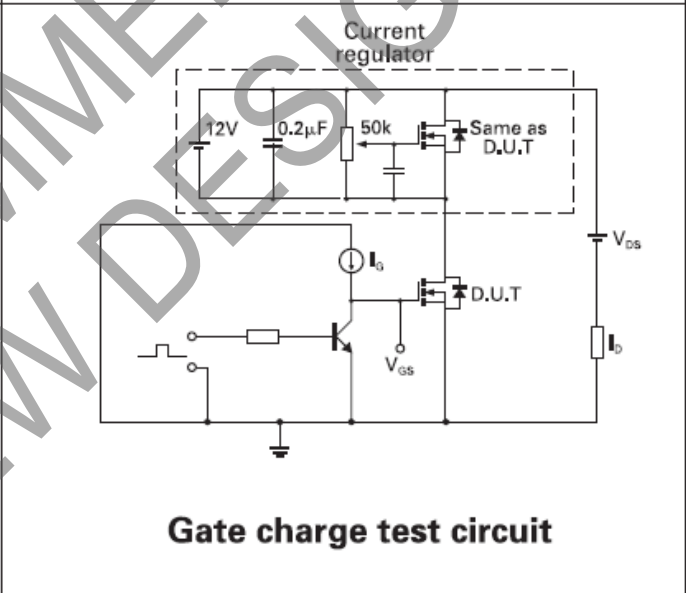
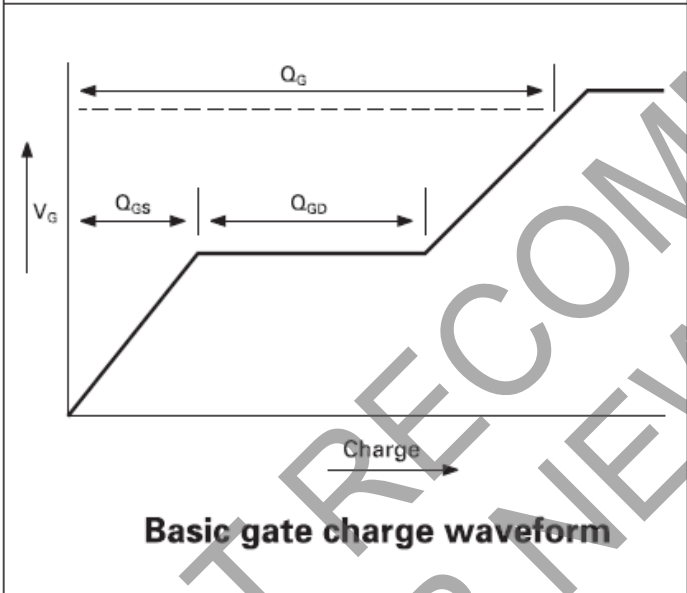
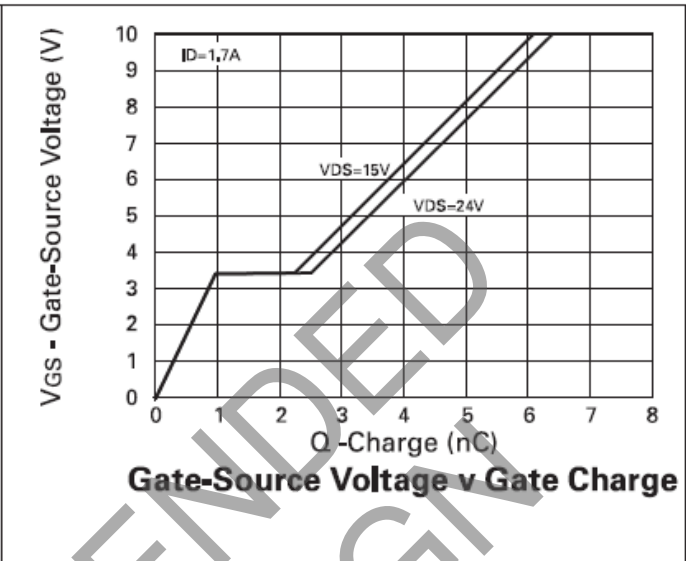
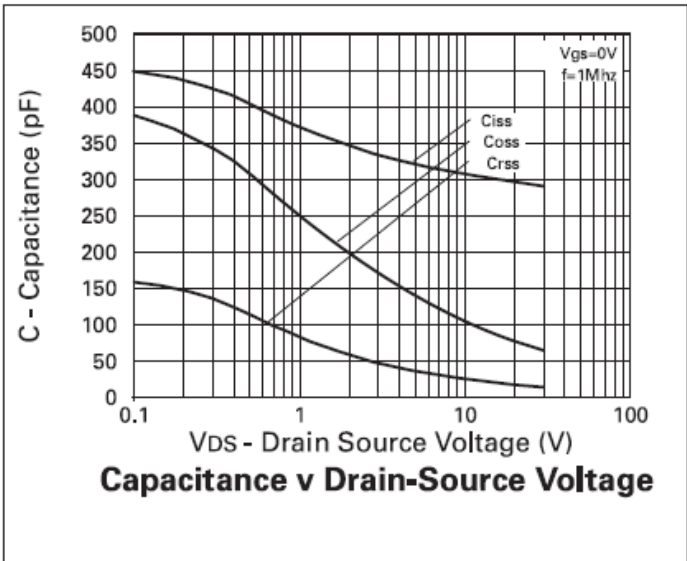
NOTES:

- (1) Measured under pulsed conditions. Width=300μs. Duty cycle ≤2%.
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.

N-Channel Typical Characteristics



N-Channel Characteristics



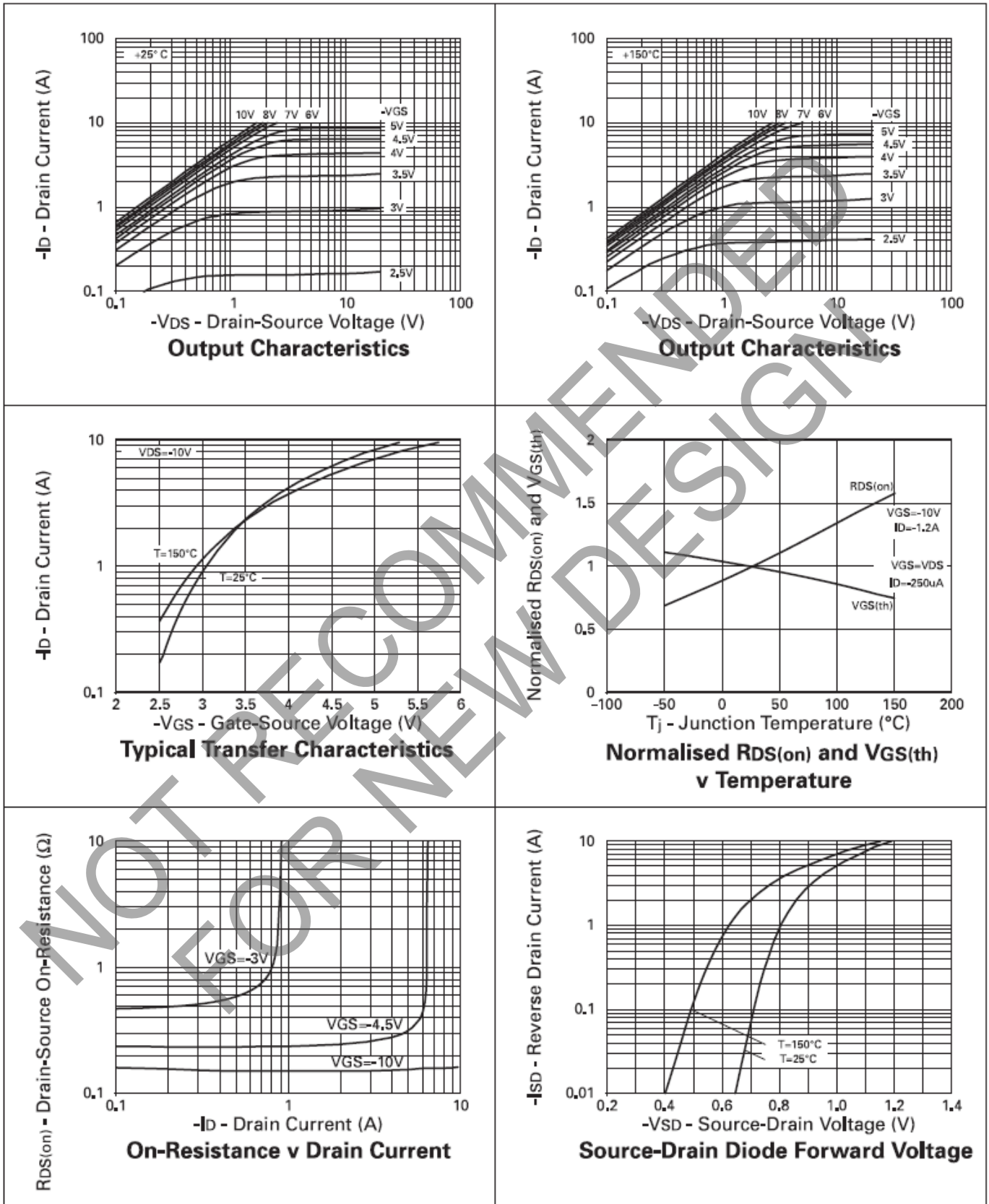
Electrical Characteristics – P-Channel (@T_A = +25°C, unless otherwise specified.)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	-30			V	I _D =-250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			-1	μA	V _{DS} =-30V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			±100	nA	V _{GS} =±20V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	-1.0			V	I _D =-250μA, V _{DS} =V _{GS}
Static Drain-Source On-State Resistance (1)	R _{DS(on)}			0.185 0.27	Ω Ω	V _{GS} =-10V, I _D =1.2A V _{GS} =-4.5V, I _D =0.6A
Forward Transconductance (3)	g _{fs}	0.92			S	V _{DS} =-10V, I _D =-0.6A
DYNAMIC (3)						
Input Capacitance	C _{iss}		270		pF	V _{DS} =-25V, V _{GS} =0V, f=1MHz
Output Capacitance	C _{oss}		80		pF	
Reverse Transfer Capacitance	C _{rss}		30		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	t _{d(on)}		2.6		ns	V _{DD} =-15V, I _D =-1.2A R _G =6.2Ω, R _D =6.2Ω (Refer to test circuit)
Rise Time	t _r		4.8		ns	
Turn-Off Delay Time	t _{d(off)}		13.1		ns	
Fall Time	t _f		9.3		ns	
Total Gate Charge	Q _g			7	nC	V _{DS} =-24V, V _{GS} =-10V, I _D =-1.2A (Refer to test circuit)
Gate-Source Charge	Q _{gs}			1.2	nC	
Gate Drain Charge	Q _{gd}			2	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V _{SD}			-0.95	V	T _J =25°C, I _S =-1.2A, V _{GS} =0V
Reverse Recovery Time (3)	t _{rr}		21.4		ns	T _J =25°C, I _F =-1.2A, di/dt= 100A/μs
Reverse Recovery Charge(3)	Q _{rr}		15.7		nC	

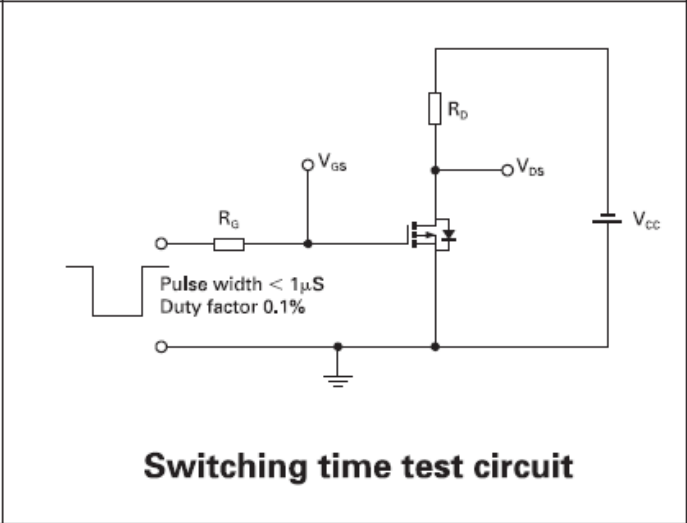
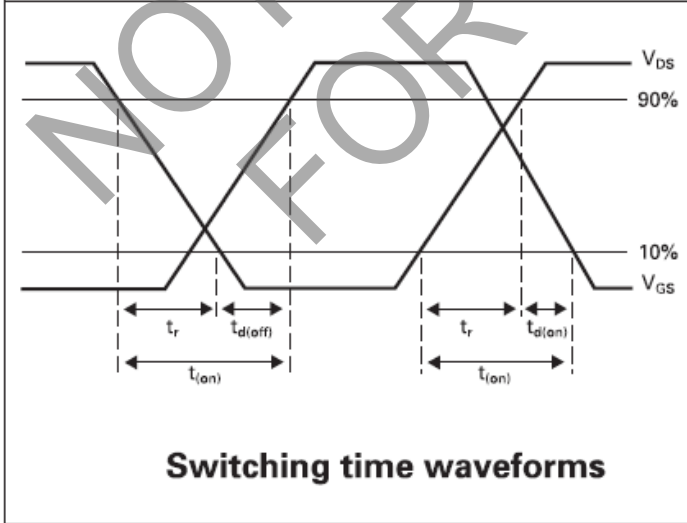
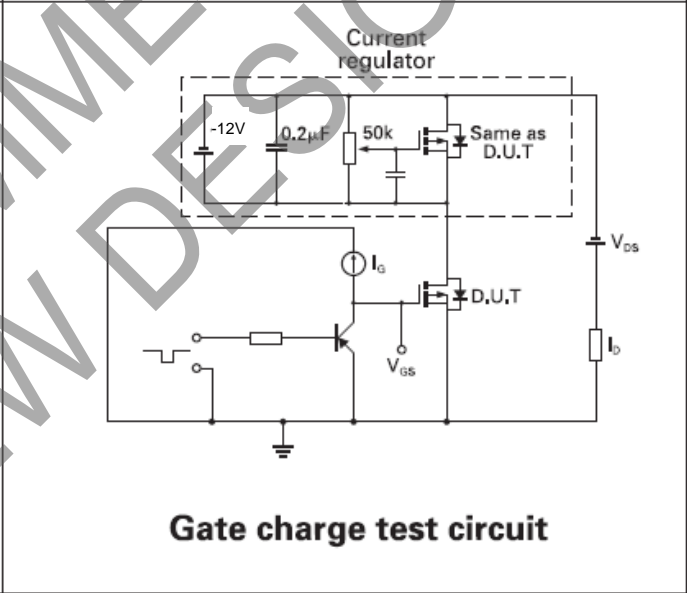
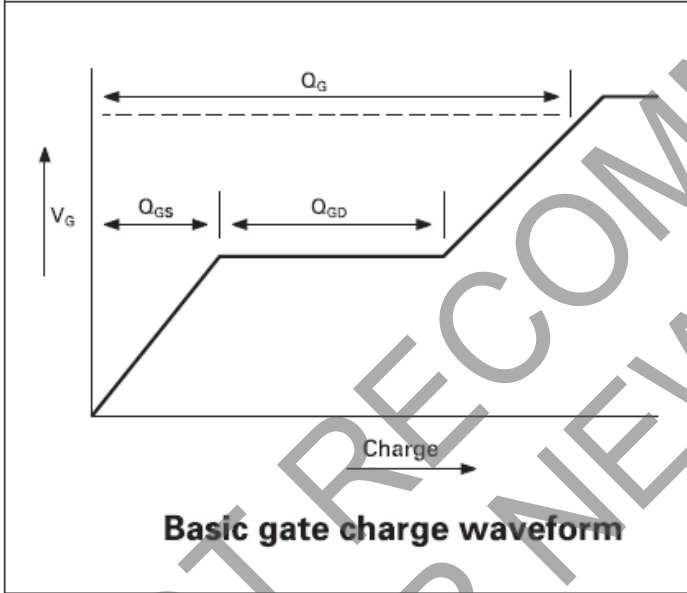
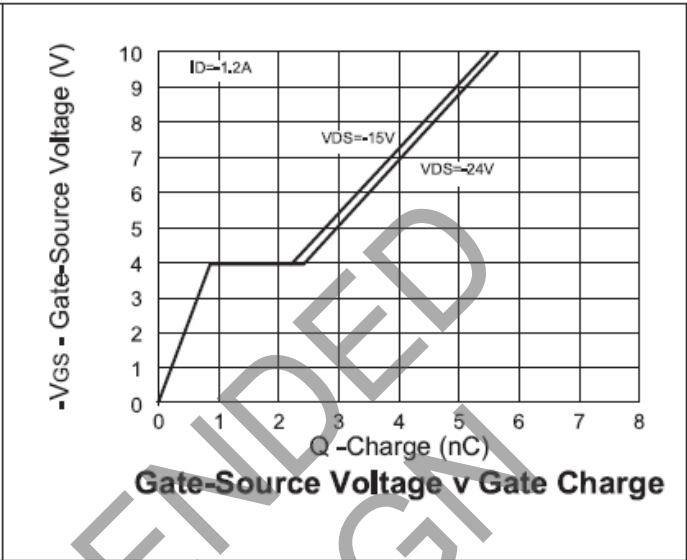
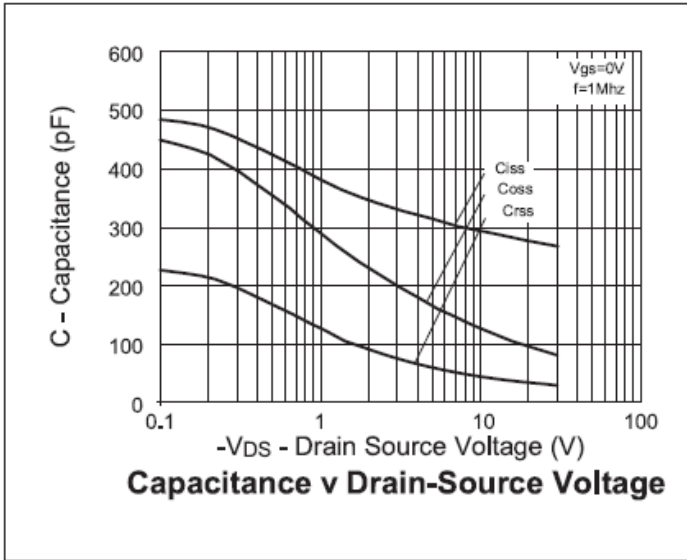
NOTES:

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P-Channel Characteristics



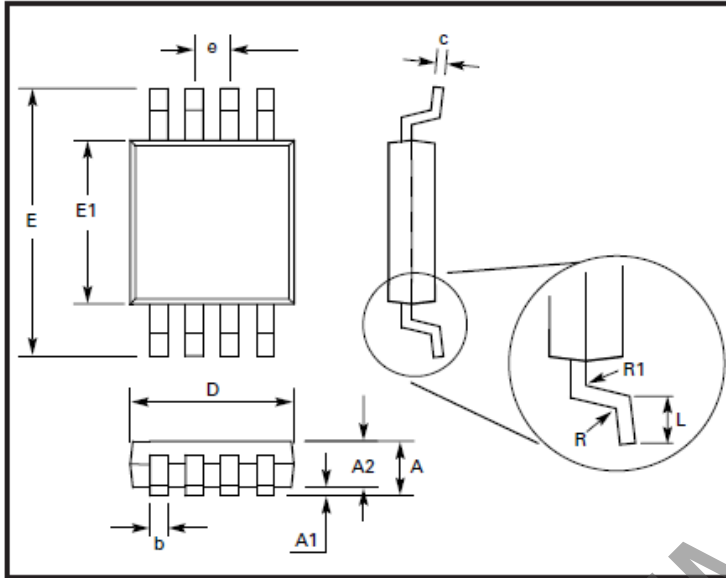
P-Channel Typical Characteristics



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

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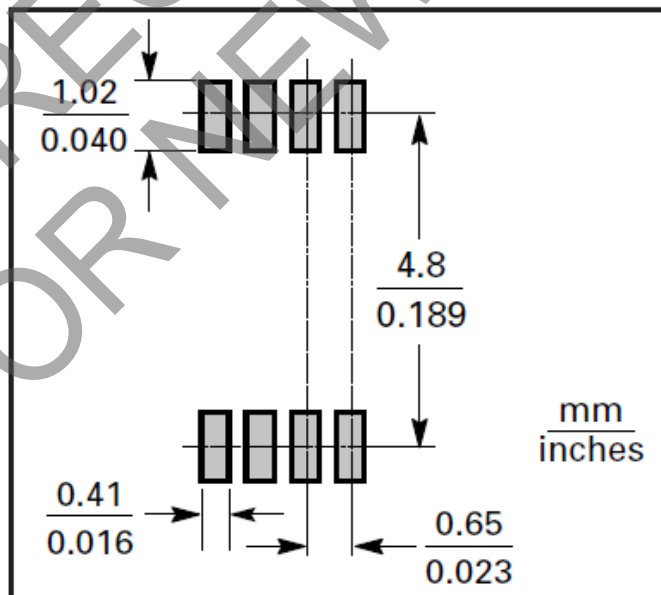


DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	-	1.10	-	0.0433
A1	0.05	0.15	0.002	0.006
A2	0.75	0.95	0.0295	0.0374
b	0.25	0.40	0.010	0.0157
c	0.13	0.23	0.005	0.009
D	2.90	3.10	0.114	0.122
E	4.90 BSC		0.193 BSC	
E1	2.90	3.10	0.114	0.122
e	0.65 BSC		0.025 BSC	
L	0.40	0.70	0.0157	0.0192
R	0.07	-	0.0027	-
R1	0.07	-	0.0027	-

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

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