CEZ3R19A

Dual Enhancement Mode Field Effect Transistor (N and P Channel)

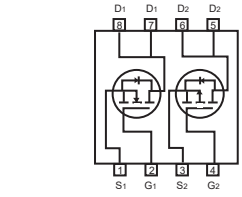
FEATURES

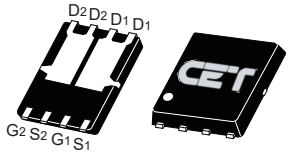
- High power and current handing capability.
- Reliable and rugged.
- Pb-free lead plating ; RoHS compliant.
- Halogen Free.
- Surface mount Package.

APPLICATIONS

- Synchronous Rectification.
- DC/DC converters.
- Motor Control.

	V_{DSS}	$R_{DS(ON)\ typ}$@V_{GS}	I_D
N Channel	30V	9.2mΩ@V_{GS} = 10V	40A
P Channel	-30V	12.5mΩ@V_{GS} = -10V	-34A





P-PAK 5X6

ABSOLUTE MAXIMUM RATINGS T_C = 25°C unless otherwise noted

Parameter		Symbol	N-Channel	P-Channel	Units
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Drain Current-Continuous	I_D @$R_{\theta JC}$	T_C =25°C	40	-34	A
		T_C =70°C	32	-27	A
	I_D @$R_{\theta JA}$	T_A =25°C	13	-11	A
		T_A =70°C	11	-9.1	A
Drain Current-Pulsed [a]	I_{DM} @$R_{\theta JC}$	T_C =25°C	160	-136	A
	I_{DM} @$R_{\theta JA}$	T_A =25°C	52	-44	A
Maximum Power Dissipation		P_D	27.8		W
Operating and Store Temperature Range		T_J,T_{stg}	-55 to 150		°C

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.5	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	°C/W

N-Channel Electrical Characteristics T_C = 25°C unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{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, Forward	I_{GSSF}	V_{GS} = 20V, V_{DS} = 0V			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	V_{GS} = -20V, V_{DS} = 0V			-100	nA
On Characteristics [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 250μA	1.3		3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 6A		9.2	11.0	mΩ
		V_{GS} = 4.5V, I_D = 3A		11.0	14.3	mΩ
Gate input resistance	R_g	f=1MHz,open Drain		1.6		Ω
Dynamic Characteristics [c]						
Input Capacitance	C_{iss}	V_{DS} = 15V, V_{GS} = 0V, f = 1.0 MHz		650		pF
Output Capacitance	C_{oss}			100		pF
Reverse Transfer Capacitance	C_{rss}			85		pF
Switching Characteristics [c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15V, I_D = 10A, V_{GS} = 10V, R_{GEN} = 6Ω		17		ns
Turn-On Rise Time	t_r			7		ns
Turn-Off Delay Time	$t_{d(off)}$			23		ns
Turn-Off Fall Time	t_f			15		ns
Total Gate Charge	Q_g	V_{DS} = 15V, I_D = 10A, V_{GS} = 4.5V		6.2		nC
Gate-Source Charge	Q_{gs}			1.6		nC
Gate-Drain Charge	Q_{gd}			3.6		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Current-Continuous	I_S				33	A
Drain-Source Diode Current-Pulsed [b]	I_{SM}				160	A
Drain-Source Diode Forward Voltage [b]	V_{SD}	V_{GS} = 0V, I_S = 1A			1.2	V

Notes :
a.Repetitive Rating : Pulse width limited by maximum junction temperature.
b.Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
c.Guaranteed by design, not subject to production testing.

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P-Channel Electrical Characteristics T_C = 25°C unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{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, Forward	I_{GSSF}	V_{GS} = 20V, V_{DS} = 0V			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	V_{GS} = -20V, V_{DS} = 0V			-100	nA
On Characteristics [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = -250μA	-1.3		-3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D =-7.5A		12.5	15.0	mΩ
		V_{GS} = -4.5V, I_D =-4A		18.8	24.4	mΩ
Gate input resistance	R_g	f=1MHz,open Drain		6.3		Ω
Dynamic Characteristics [c]						
Input Capacitance	C_{iss}	V_{DS} = -15V, V_{GS} = 0V, f = 1.0 MHz		1500		pF
Output Capacitance	C_{oss}			190		pF
Reverse Transfer Capacitance	C_{rss}			160		pF
Switching Characteristics [c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -15V, I_D = -10A, V_{GS} = -10V, R_{GEN} = 6Ω		17		ns
Turn-On Rise Time	t_r			10		ns
Turn-Off Delay Time	$t_{d(off)}$			45		ns
Turn-Off Fall Time	t_f			15		ns
Total Gate Charge	Q_g	V_{DD} = -15V, I_D = -10A, V_{GS} = -4.5V		12		nC
Gate-Source Charge	Q_{gs}			3.3		nC
Gate-Drain Charge	Q_{gd}			6.5		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Current-Continuous	I_S				-33	A
Drain-Source Diode Current-Pulsed [b]	I_{SM}				-136	A
Drain-Source Diode Forward Voltage [b]	V_{SD}	V_{GS} = 0V, I_S = -7.5A			-1.3	V

Notes :
a.Repetitive Rating : Pulse width limited by maximum junction temperature.
b.Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
c.Guaranteed by design, not subject to production testing.

N-CHANNEL

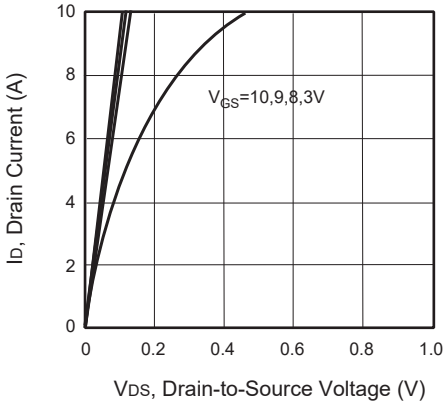


Figure 1. Output Characteristics

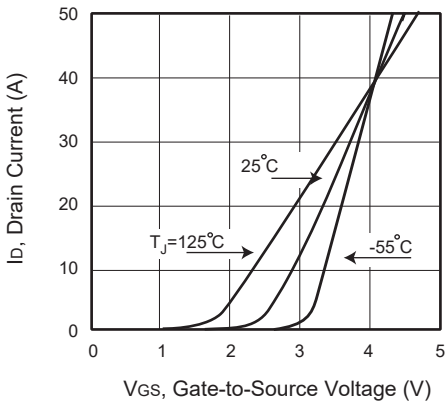


Figure 2. Transfer Characteristics

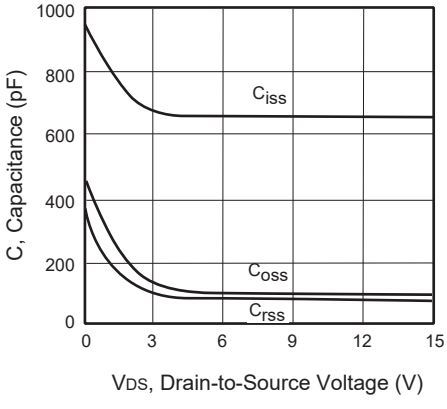


Figure 3. Capacitance

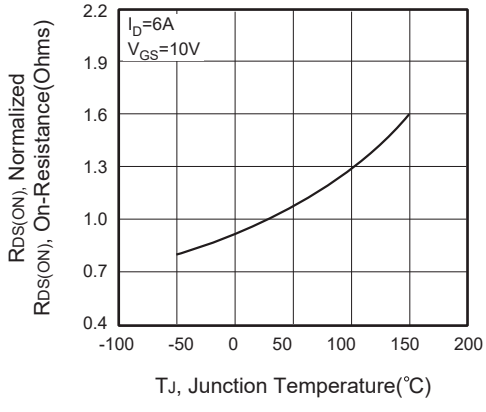


Figure 4. On-Resistance Variation with Temperature

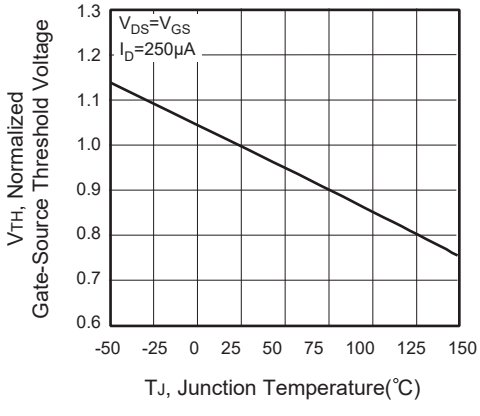


Figure 5. Gate Threshold Variation with Temperature

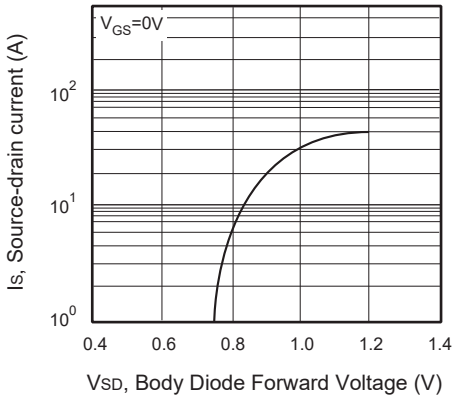


Figure 6. Body Diode Forward Voltage Variation with Source Current

P-CHANNEL

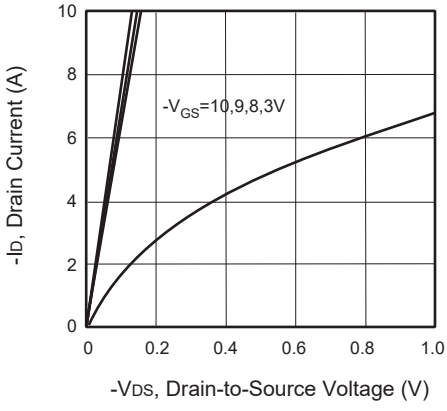


Figure 7. Output Characteristics

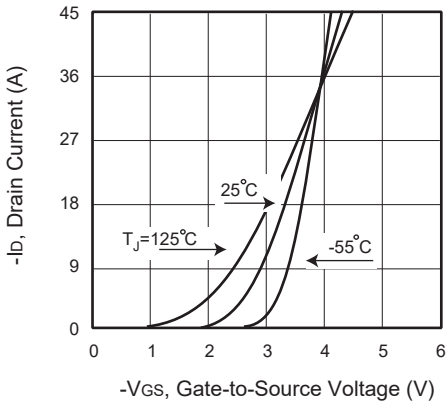


Figure 8. Transfer Characteristics

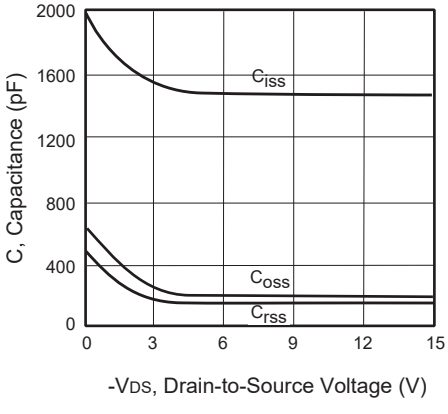


Figure 9. Capacitance

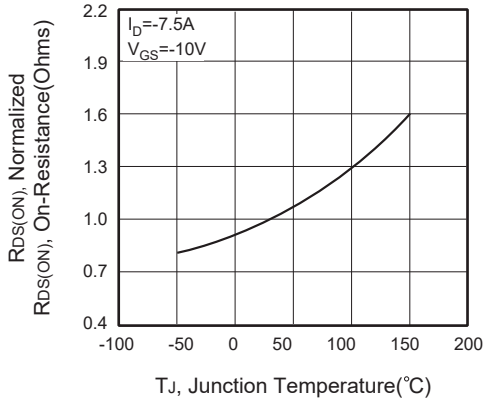


Figure 10. On-Resistance Variation with Temperature

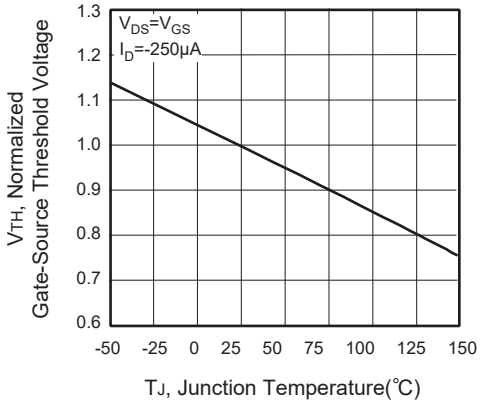


Figure 11. Gate Threshold Variation with Temperature

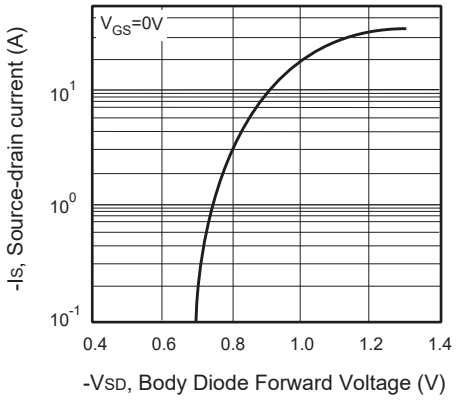


Figure 12. Body Diode Forward Voltage Variation with Source Current

N-CHANNEL

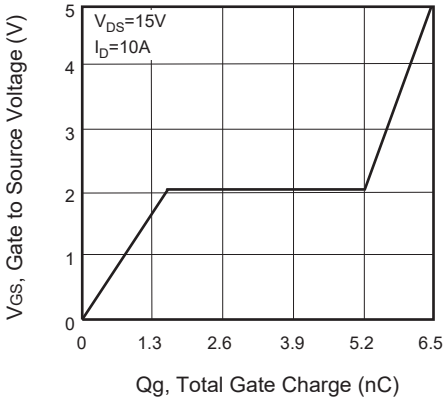


Figure 13. Gate Charge

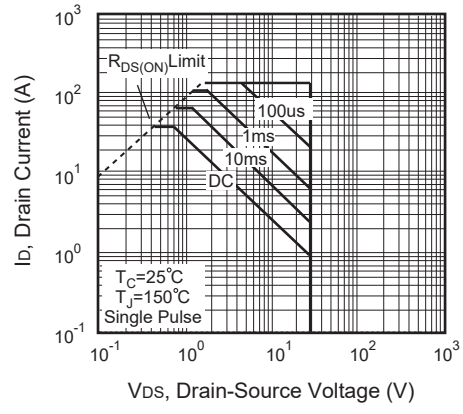


Figure 14. Maximum Safe Operating Area

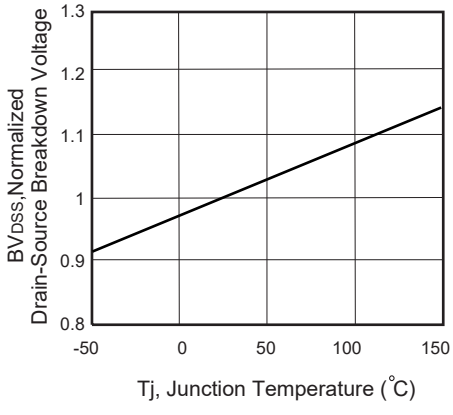


Figure 15. Breakdown Voltage Variation VS Temperature

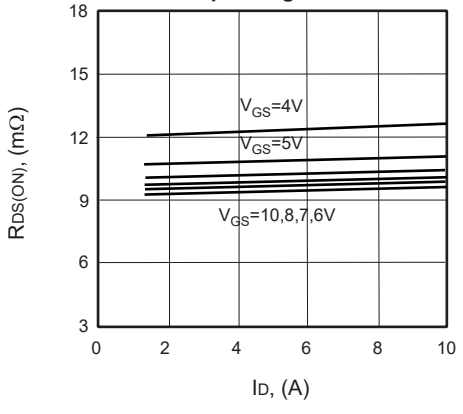


Figure 16. On-Resistance vs. Drain Current

P-CHANNEL

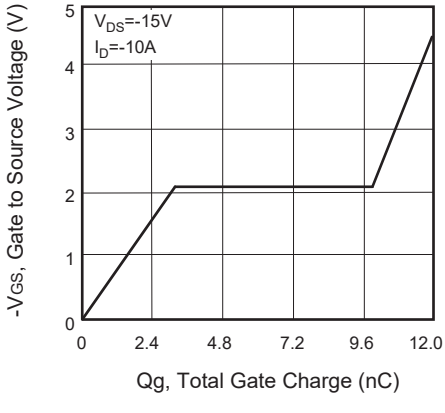


Figure 17. Gate Charge

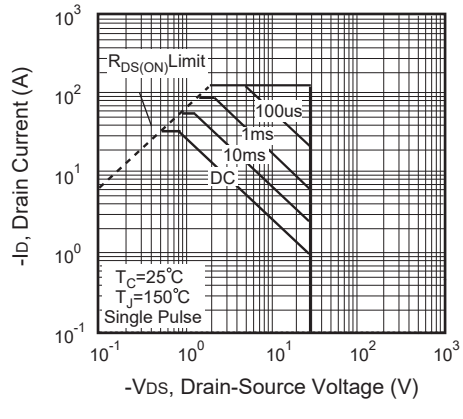


Figure 18. Maximum Safe Operating Area

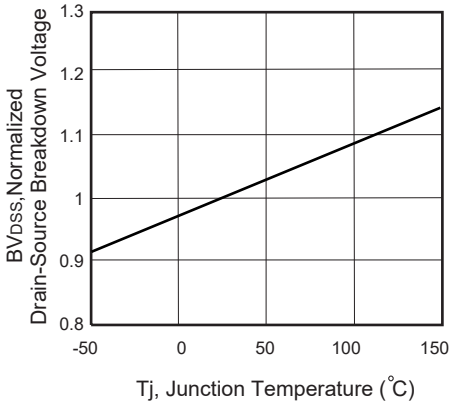


Figure 19. Breakdown Voltage Variation VS Temperature

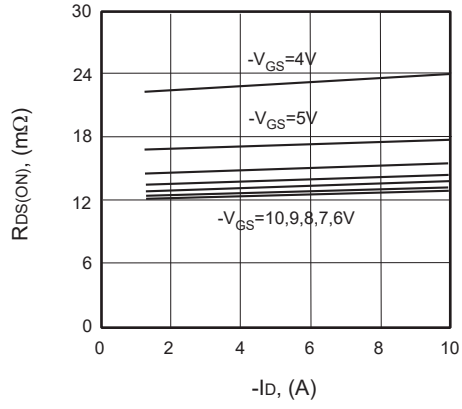


Figure 20. On-Resistance vs. Drain Current

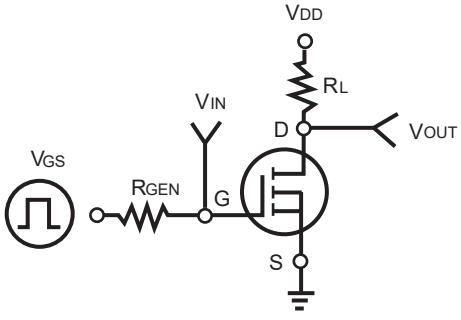


Figure 21. Switching Test Circuit

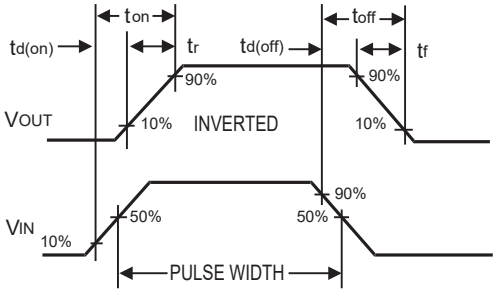


Figure 22. Switching Waveforms

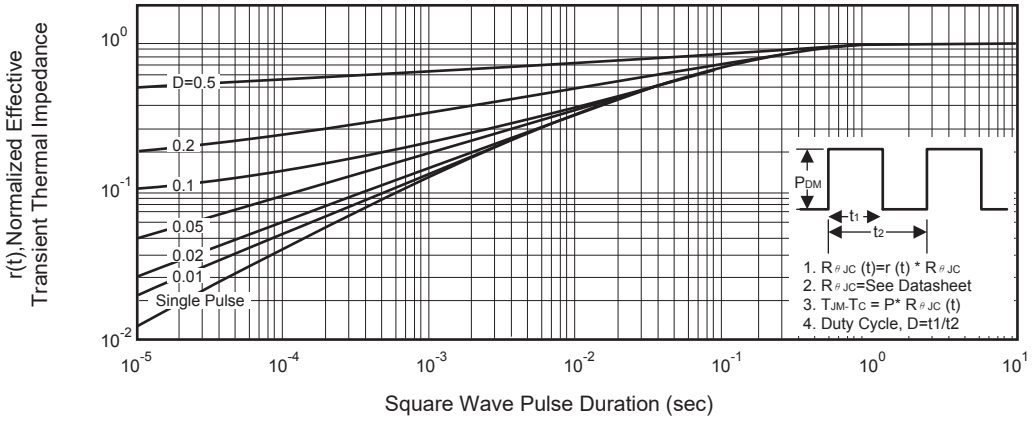
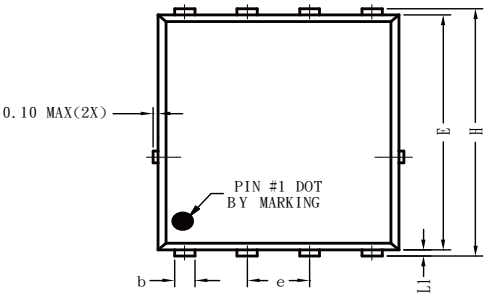
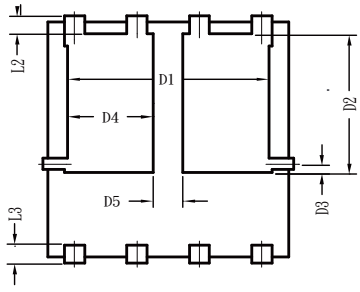


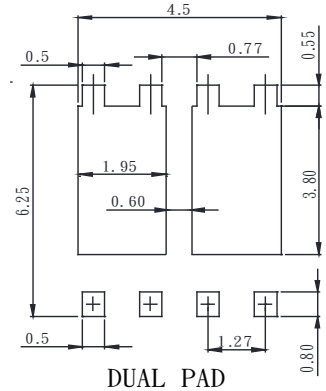
Figure 23. Normalized Thermal Transient Impedance Curve

P-PAK5X6 產品外觀尺寸圖 (Product Outline Dimension)

DUAL PAD 尺寸圖

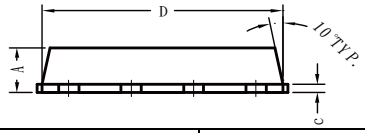






DUAL PAD

RECOMMENDED LAND PATTERN



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.800	1.170	0.031	0.046
b	0.340	0.490	0.013	0.019
c	0.20	0.34	0.008	0.013
D	4.800	5.100	0.009	0.011
D1	3.800	4.200	0.150	0.165
D2	3.180	3.78	0.125	0.149
D3	0.150	0.360	0.006	0.142
D4	1.600	1.800	0.063	0.071
D5	0.500	0.700	0.020	0.028
E	5.650	5.900	0.222	0.232
e	1.270 TYP		0.050 TYP	
H	5.900	6.150	0.232	0.242
L1	0.050	0.250	0.002	0.010
L2	0.380	0.620	0.015	0.024
L3	0.380	0.75	0.015	0.030