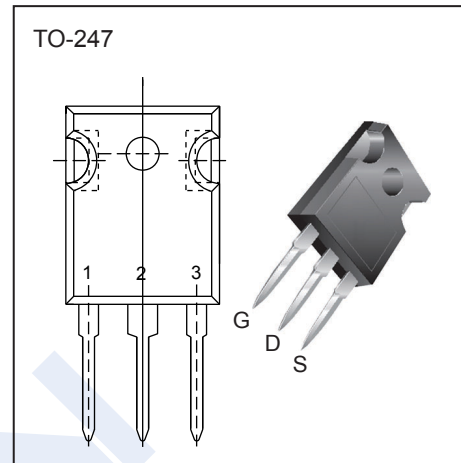
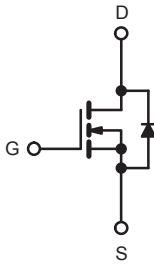


N-Channel MOSFET

IRFP064PBF (KRFP064PBF)

■ Features

- $V_{DS} (V) = 60V$
- $I_D = 70 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 9m\Omega (V_{GS} = 10V)$
- Very Low Thermal Resistance
- Isolated Central Mounting Hole
- Fast Switching
- Dynamic dV/dt Rating



■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current	$T_c=25^\circ C$	I_D	70	A
	$T_c=70^\circ C$		70	
Pulsed Drain Current		I_{DM}	520	
Repetitive Avalanche Current		I_{AR}	70	
Power Dissipation	$T_c=25^\circ C$	P_D	300	W
Linear Derating Factor			2	W/ $^\circ C$
Single Pulse Avalanche Energy (Note.1)		E_{AS}	1000	mJ
Repetitive Avalanche Energy		E_{AR}	30	
Peak Diode Recovery dV/dt (Note.2)		dV/dt	4.5	V/ns
Thermal Resistance.Junction- to-Ambient		R_{thJA}	40	$^\circ C/W$
Thermal Resistance.Junction- to-Sink		R_{thJS}	0.24 (typ)	
Thermal Resistance.Junction- to-Case		R_{thJC}	0.5	
Junction Temperature		T_J	175	$^\circ C$
Storage Temperature Range		T_{stg}	-55 to 175	

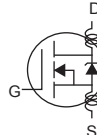
Note.1 : $V_{DD} = 25V$, starting $T_J = 25^\circ C$, $L = 69\mu H$, $R_g = 25\Omega$, $I_{AS} = 130A$

Note.2 : $I_{SD} \leq 130A$, $dI/dt \leq 300A/\mu s$, $V_{DD} \leq V_{DS}$, $T_J \leq 175^\circ C$.

N-Channel MOSFET

IRFP064PBF (KRFP064PBF)

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{DSS}	I _D =250 μA, V _{GS} =0V	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			25	μA
		V _{DS} =48V, V _{GS} =0V, T _J =150°C			250	
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μA	2		4	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =78A (Note.1)			9	mΩ
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =78A	38			S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz		7400		pF
Output Capacitance	C _{oss}			3200		
Reverse Transfer Capacitance	C _{rss}			540		
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =48V, I _D =130A (Note.1)			190	nC
Gate Source Charge	Q _{gs}				55	
Gate Drain Charge	Q _{gd}				90	
Turn-On DelayTime	t _{d(on)}	V _{DS} =30V, I _D =130A, R _D =0.22 Ω, R _G =4.3 Ω (Note.1)		21		ns
Turn-On Rise Time	t _r			190		
Turn-Off DelayTime	t _{d(off)}			110		
Turn-Off Fall Time	t _f			190		
Body Diode Reverse Recovery Time	t _{rr}	I _F =130A, di/dt=100A/μs, T _J =25°C		160	250	ns
Body Diode Reverse Recovery Charge	Q _{rr}			0.9	1.7	
Internal Drain Inductance	L _D	Between lead, 6 mm (0.25") from package and center of die contact 		5		nH
Internal Source Inductance	L _S			13		
Maximum Body-Diode Continuous Current	I _S				70	A
Pulsed Diode Forward Current	I _{SM}				520	
Diode Forward Voltage	V _{SD}	I _S =130A, V _{GS} =0V, T _J =25°C (Note.1)			3	V

Note.1: Pulse width ≤ 300 μs; duty cycle ≤ 2 %.

N-Channel MOSFET

IRFP064PBF (KRFP064PBF)

■ Typical Characteristics

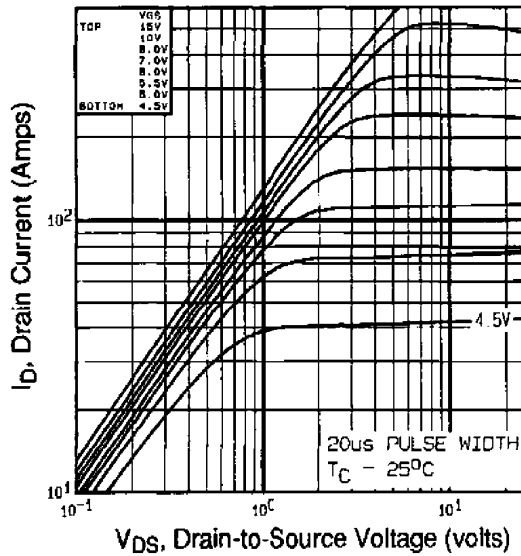
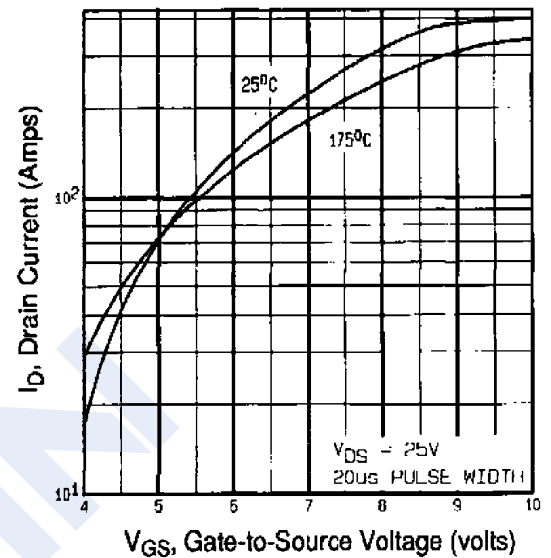
Fig. 1 - Typical Output Characteristics, $T_C = 25^\circ\text{C}$ 

Fig. 3 - Typical Transfer Characteristics

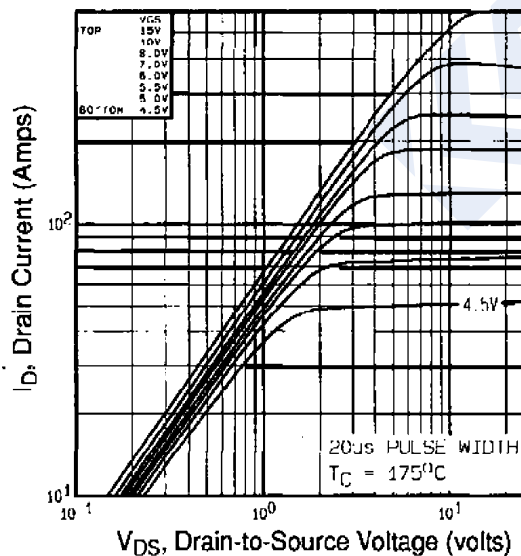
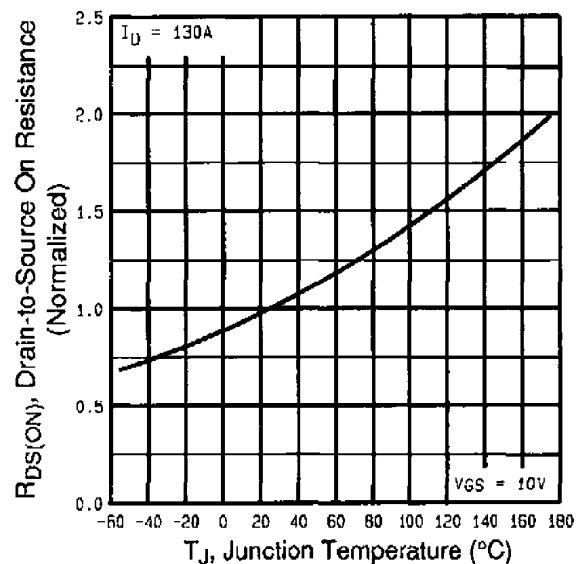
Fig. 2 - Typical Output Characteristics, $T_C = 175^\circ\text{C}$ 

Fig. 4 - Normalized On-Resistance vs. Temperature

N-Channel MOSFET

IRFP064PBF (KRFP064PBF)

■ Typical Characteristics

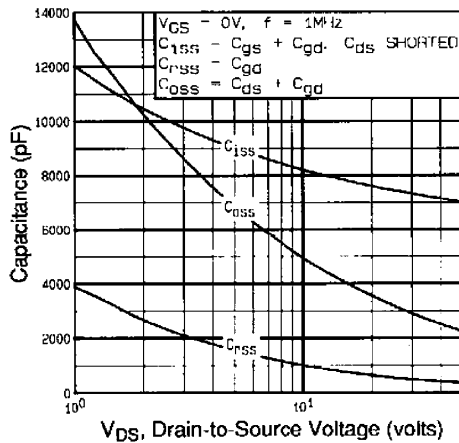


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

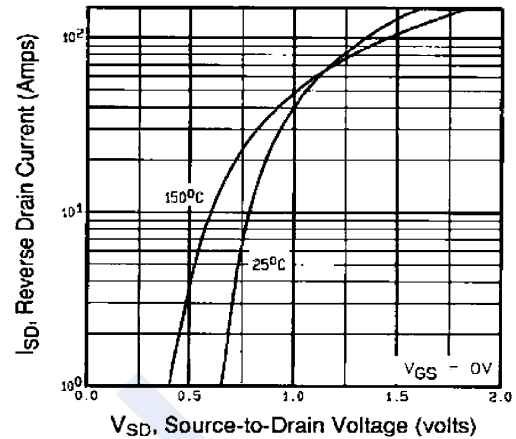


Fig. 7 - Typical Source-Drain Diode Forward Voltage

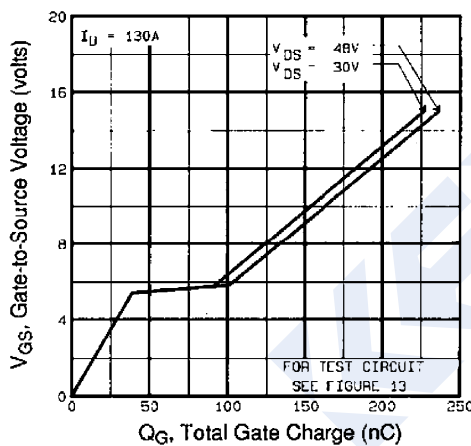


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

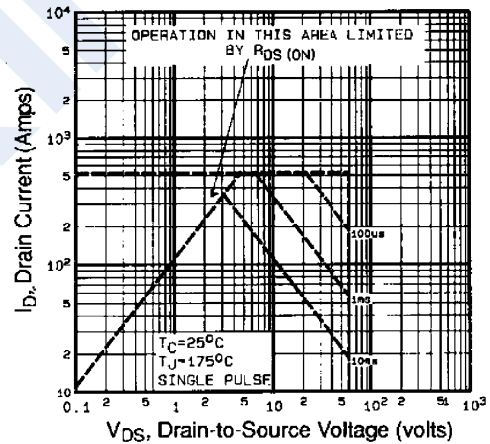


Fig. 8 - Maximum Safe Operating Area

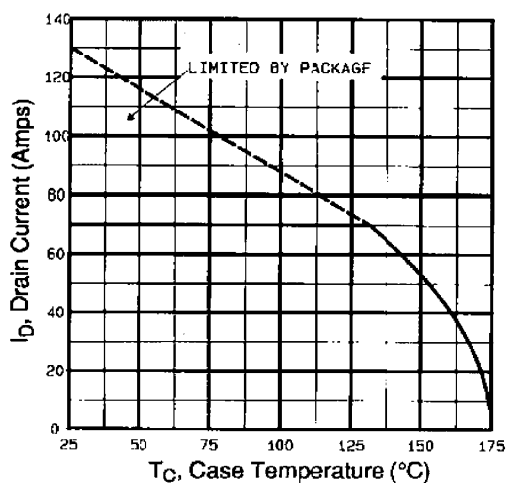


Fig. 9 - Maximum Drain Current vs. Case Temperature

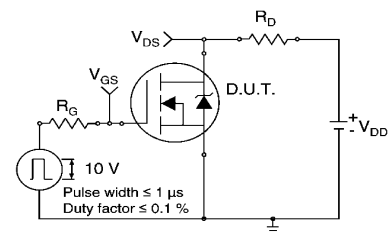


Fig. 10a - Switching Time Test Circuit

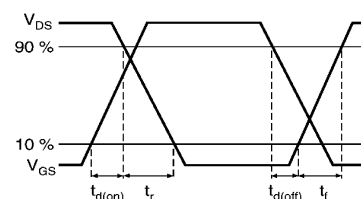


Fig. 10b - Switching Time Waveforms

N-Channel MOSFET

IRFP064PBF (KRFP064PBF)

■ Typical Characteristics

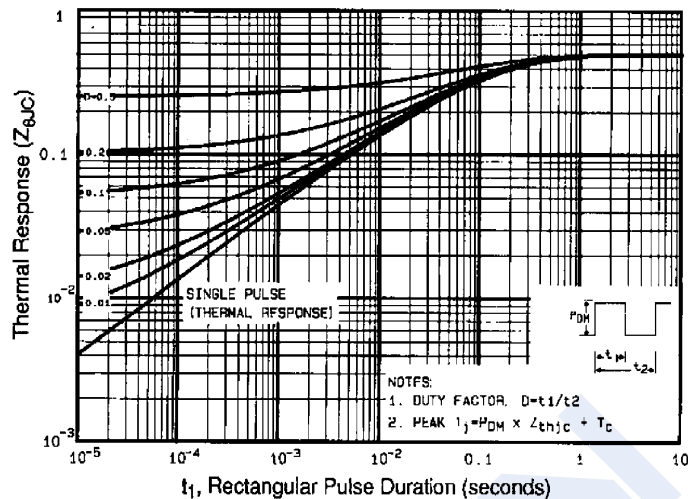


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

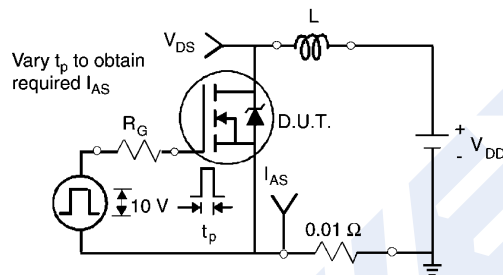


Fig. 12a - Unclamped Inductive Test Circuit

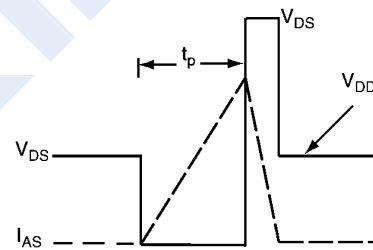


Fig. 12b - Unclamped Inductive Waveforms

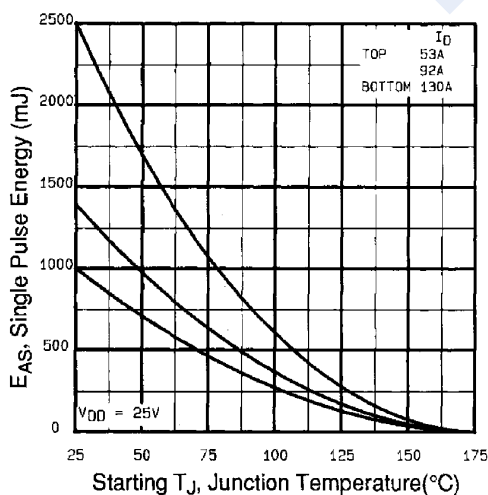


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

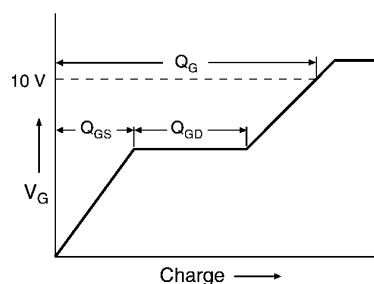


Fig. 13a - Basic Gate Charge Waveform

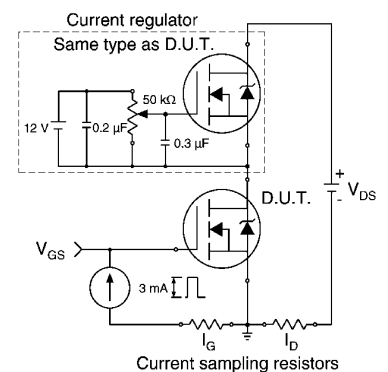


Fig. 13b - Gate Charge Test Circuit

N-Channel MOSFET

IRFP064PBF (KRFP064PBF)

■ Typical Characteristics

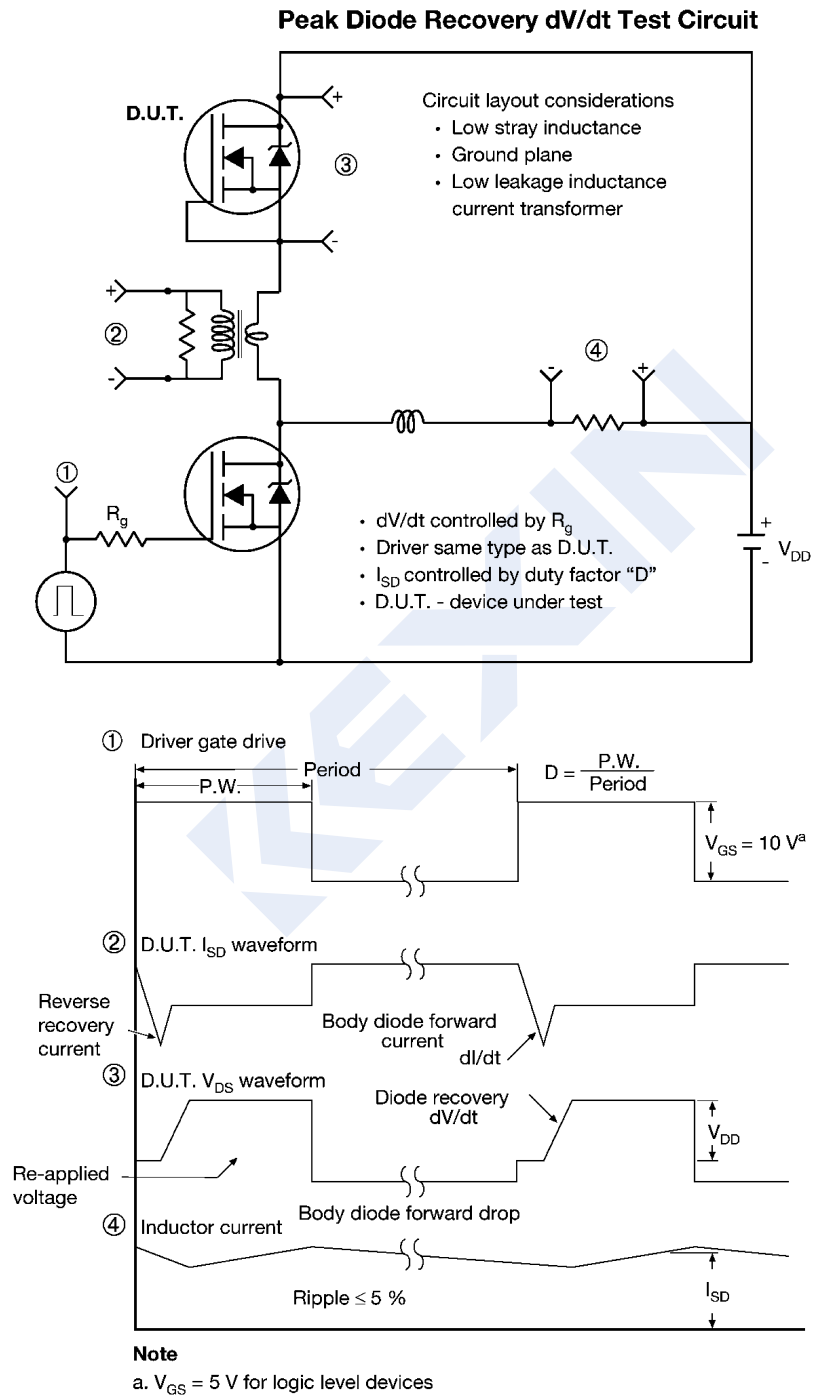
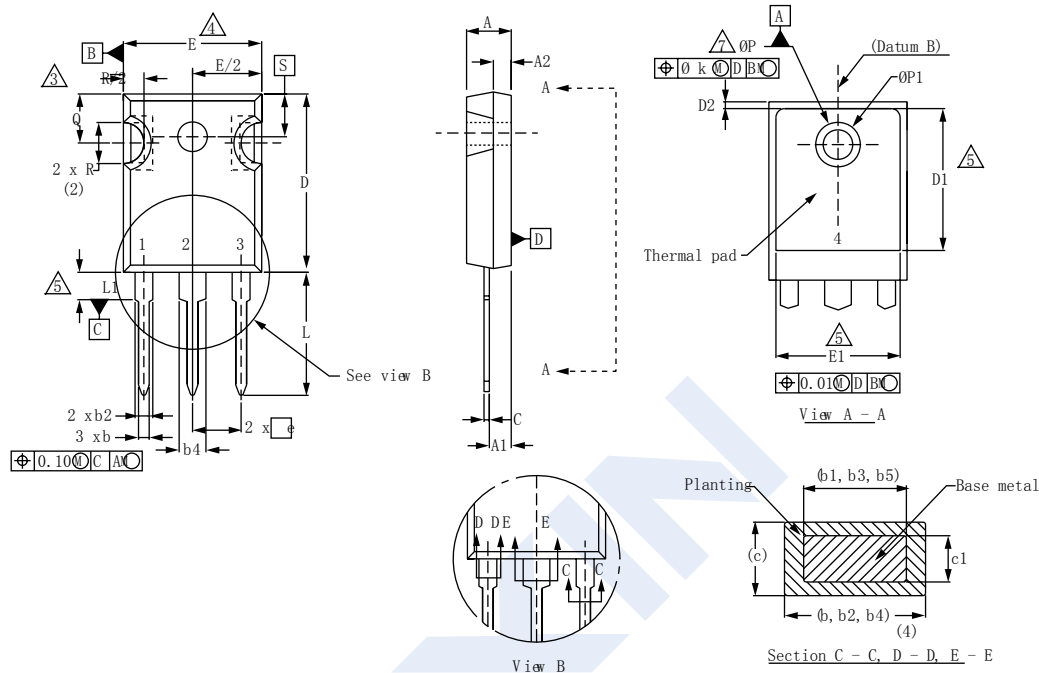


Fig. 14 - For N-Channel

Package Outline Dimensions

TO-247 (HIGH VOLTAGE)



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.65	5.31	0.183	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	0.99	1.40	0.039	0.055
b1	0.99	1.35	0.039	0.053
b2	1.65	2.39	0.065	0.094
b3	1.65	2.37	0.065	0.093
b4	2.59	3.43	0.102	0.135
b5	2.59	3.38	0.102	0.133
c	0.38	0.86	0.015	0.034
c1	0.38	0.76	0.015	0.030
D	19.71	20.70	0.776	0.815
D1	13.08	-	0.515	-

DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
D2	0.51	1.30	0.020	0.051
E	15.29	15.87	0.602	0.625
E1	13.72	-	0.540	-
e	5.46 BSC		0.215 BSC	
Ø k	0.254		0.010	
L	14.20	16.10	0.559	0.634
L1	3.71	4.29	0.146	0.169
N	7.62 BSC		0.300 BSC	
Ø P	3.56	3.66	0.140	0.144
Ø P1	-	7.39	-	0.291
Q	5.31	5.69	0.209	0.224
R	4.52	5.49	0.178	0.216
S	5.51 BSC		0.217 BSC	

ECN: S-81920-Rev. A, 15-Sep-08
DWG: 5971

Notes

1. Dimensioning and tolerancing per ASME Y14.5M-1994.
2. Contour of slot optional.
3. Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body.
4. Thermal pad contour optional with dimensions D1 and E1.
5. Lead finish uncontrolled in L1.
6. Ø P to have a maximum draft angle of 1.5 to the top of the part with a maximum hole diameter of 3.91 mm (0.154").
7. Outline conforms to JEDEC outline TO-247 with exception of dimension c.