

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology
- ★ 100% EAS Guaranteed

Product Summary

RoHS

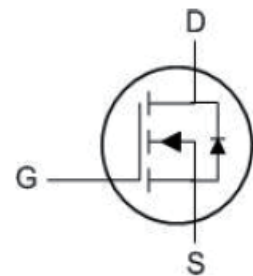
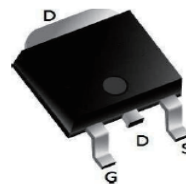
BVDSS	RDS(on)	ID
60V	6.8mΩ	65A

Description

The 65N06 is the high cell density trenched N-ch MOSFETs, which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications.

The 65N06 meet the RoHS and Green Product, requirement 100% EAS guaranteed with full function reliability approved.

TO252 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	60	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D (DC)	Drain Current (DC) at $T_c=25^\circ C$	65	A
I_D (DC)	Drain Current (DC) at $T_c=100^\circ C$	45	A
I_{DM} (pulse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	260	A
dV/dt	Peak Diode Recovery Voltage	8	V/ns
P_D	Maximum Power Dissipation ($T_c=25^\circ C$)	75	W
	Derating Factor	0.5	W/ $^\circ C$
E_{AS}	Single Pulse Avalanche Energy (Note 2)	300	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	$^\circ C$

Thermal Characteristic

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	---	2	$^\circ C/W$

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
On/Off States						
BV _{bss}	Drain-Source Breakdown Voltage	V _{GS} =0V I _b =250μA	60	---	---	V
I _{bss}	Zero Gate Voltage Drain Current(T _c =25℃)	V _{DS} =64V,V _{GS} =0V	---	---	1	μA
I _{DSS}	Zero Gate Voltage Drain Current (T _c =125℃)	V _{DS} =64V,V _{GS} =0V	---	---	10	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V,V _{DS} =0V	---	---	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _b =250μA	2	---	4	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _b =40A	---	6.8	8.2	mΩ
Dynamic Characteristics						
g _{FS}	Forward Transconductance	V _{DS} =10V,I _b =15A	15	---	---	S
C _{iSS}	Input Capacitance	V _{DS} =25V,V _{GS} =0V, f=1.0MHz	---	2873	---	pF
C _{oSS}	Output Capacitance		---	252	---	pF
C _{rSS}	Reverse Transfer Capacitance		---	205	---	pF
Q _g	Total Gate Charge	V _{DS} =50V,I _b =40A, V _{GS} =10V	---	56	---	nC
Q _{gs}	Gate-Source Charge		---	10	---	nC
Q _{gd}	Gate-Drain Charge		---	16	---	nC
Switching Times						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V,I _b =2A,R _L =15Ω V _{GS} =10V,R _G =2.5Ω	---	14.5	---	nS
t _r	Turn-on Rise Time		---	24	---	nS
t _{d(off)}	Turn-Off Delay Time		---	45	---	nS
t _f	Turn-Off Fall Time		---	22	---	nS
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current(Body Diode)		---	65	---	A
I _{SDM}	Pulsed Source-Drain Current(Body Diode)		---	260	---	A
V _{SD}	Forward On Voltage (Note3)	T _J =25℃,I _{SD} =40A,V _{GS} =0V	---	0.89	0.99	V
t _{rr}	Reverse Recovery Time (Note3)	T _J =25℃,I _F =75A di/dt=100A/μs	---	22	---	nS
Q _{rr}	Reverse Recovery Charge(Note3)		---	27	---	nC
t _{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible(turn-on is dominated by L _s +L _D)				

Note :

1.Repetitive Rating: Pulse width limited by maximum junction temperature

2.EAS condition: $T_J=25^\circ\text{C}, V_{DD}=33V, V_G=10V$

3.Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 1.5\%$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

Typical Performance Characteristics

Figure1: Output Characteristics

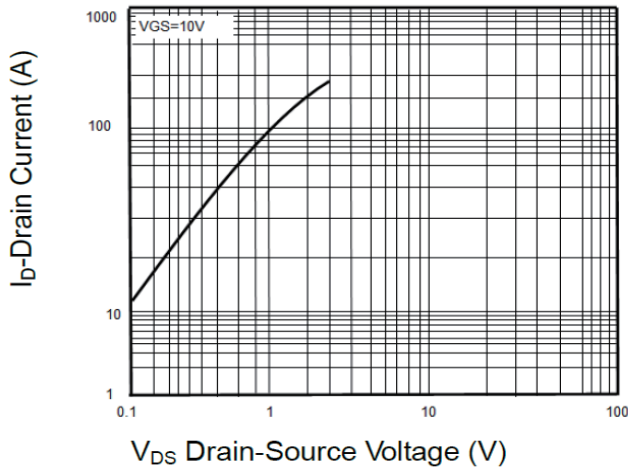


Figure 2: Typical Transfer Characteristics

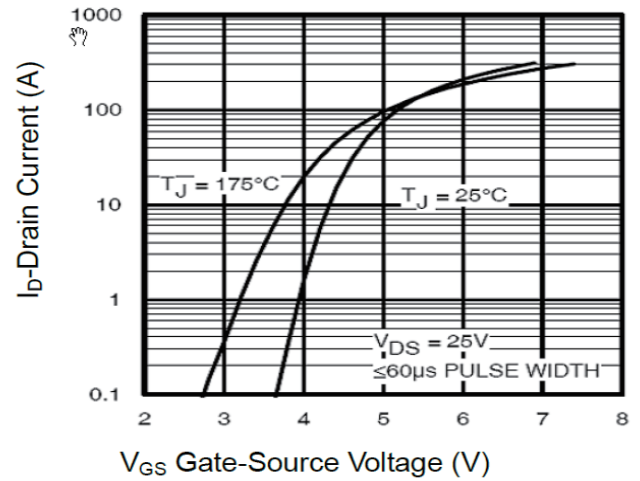


Figure 3: BVDS vs Junction Temperature

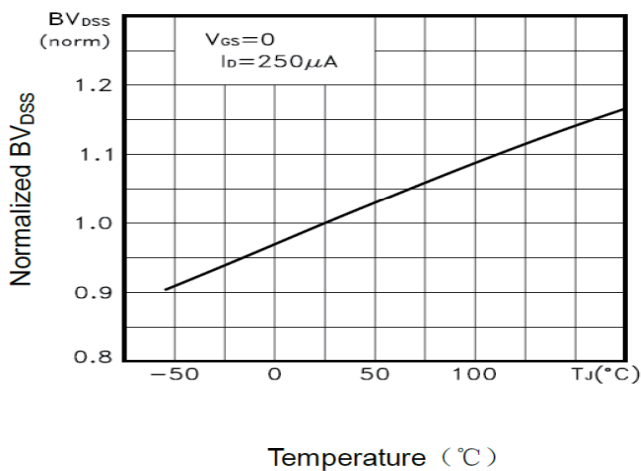


Figure 4: ID vs Junction Temperature

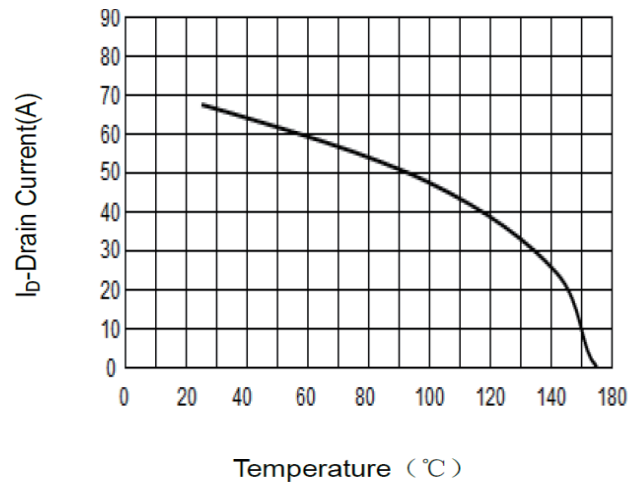


Figure 5: VGS(th) vs Junction Temperature

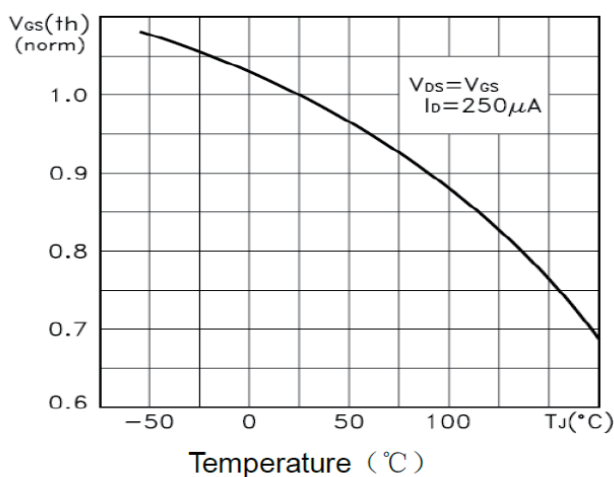
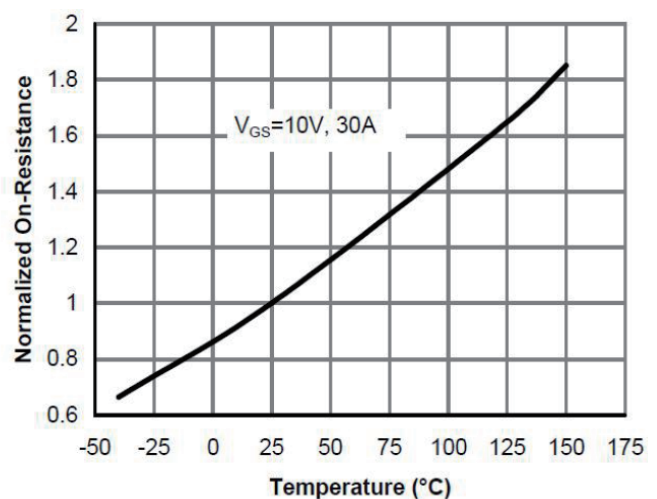


Figure 6: Rdson Vs Junction Temperature



Typical Performance Characteristics

Figure 7: Gate Charge vs V_{GS}

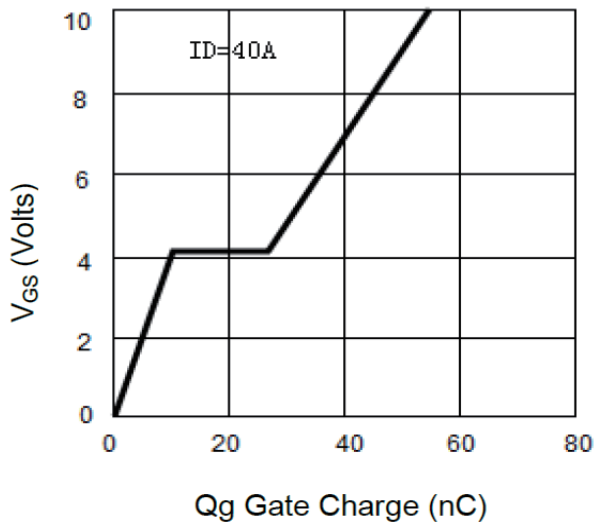


Figure 8: Capacitance vs V_{DS}

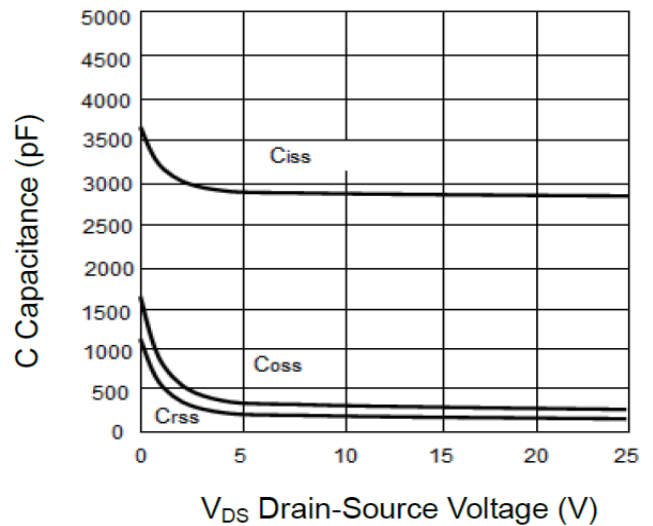


Figure 9: Source- Drain Diode Forward

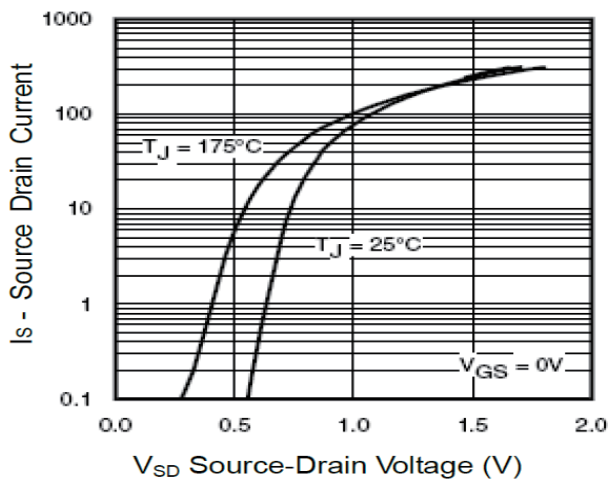


Figure 10: Safe Operation Area

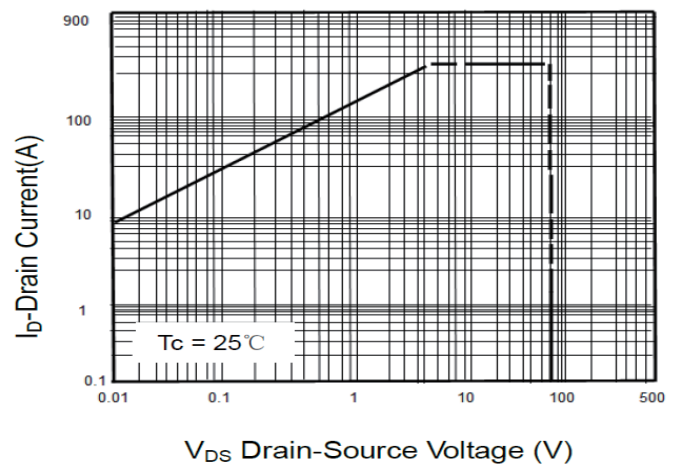
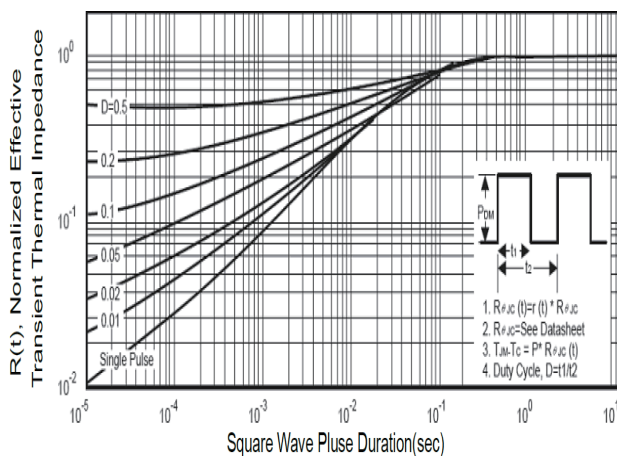
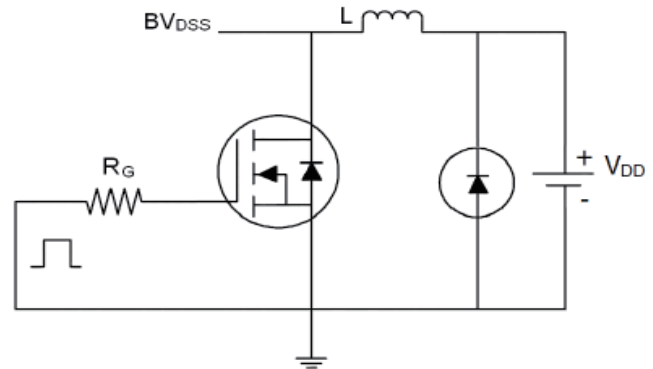
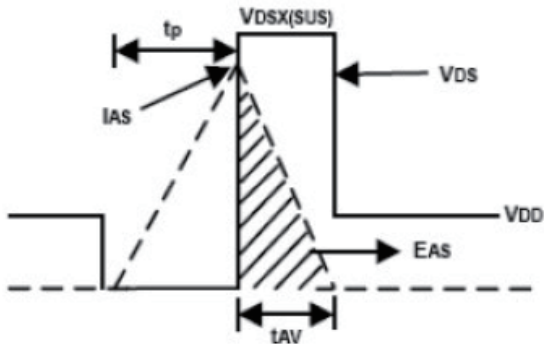


Figure 11: Normalized Maximum Transient Thermal Impedance

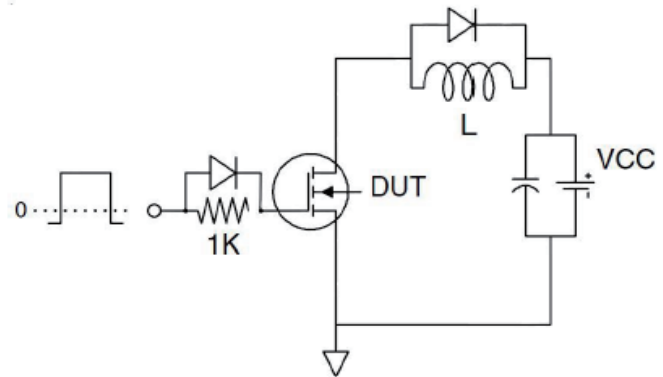
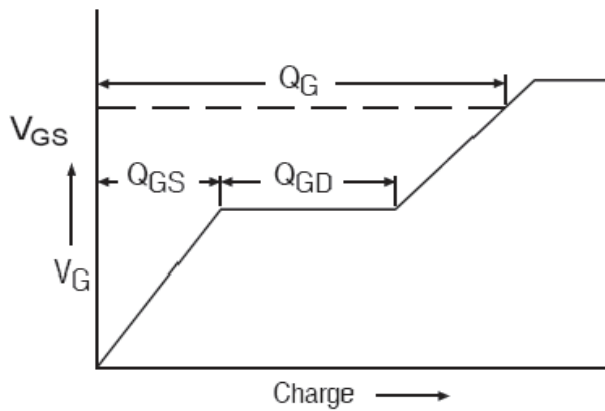


Test Circuit

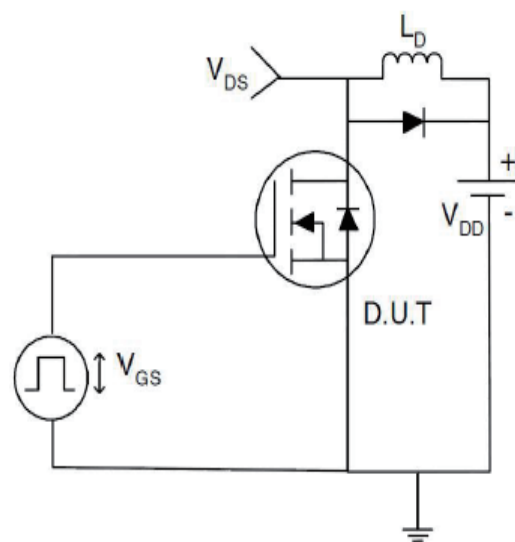
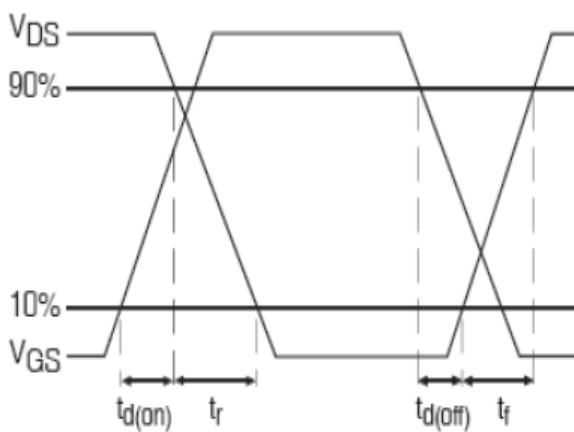
1) E_{AS} Test Circuits



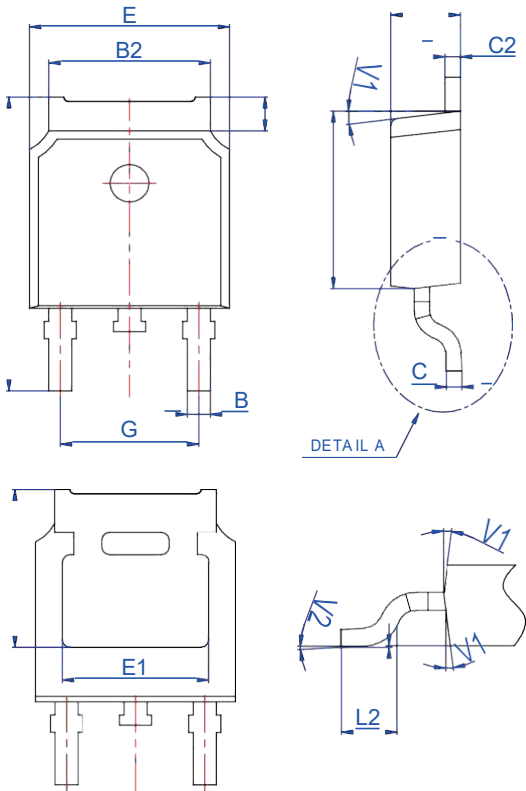
2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:

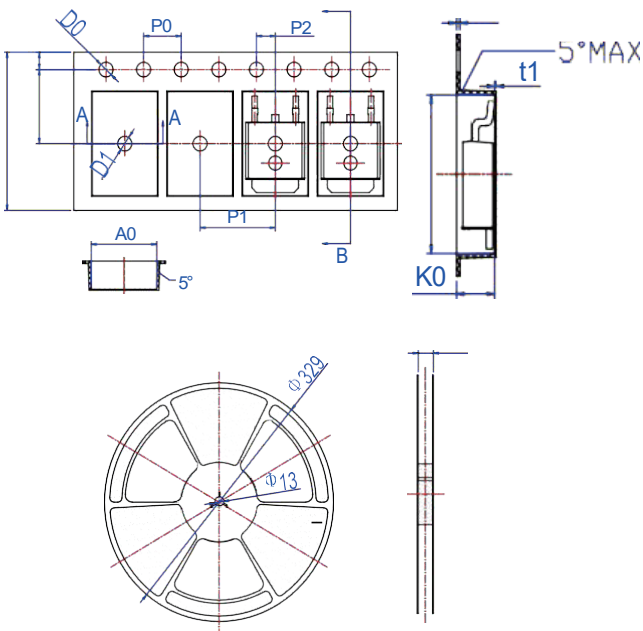


Package Mechanical Data-TO-252-4R



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.1		2.5	0.083		0.098
A2	0		0.1	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.4		0.6	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.9		6.3	0.232		0.248
D1	5.30REF			0.209REF		
E	6.4		6.8	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.5		10.7	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252-4R



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.9	16	16.1	0.626	0.63	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.4	7.5	7.6	0.291	0.295	0.299
D0	1.4	1.5	1.6	0.055	0.059	0.063
D1	1.4	1.5	1.6	0.055	0.059	0.063
P0	3.9	4	4.1	0.154	0.157	0.161
P1	7.9	8	8.1	0.311	0.315	0.319
P2	1.9	2	2.1	0.075	0.079	0.083
A0	6.85	6.9	7	0.27	0.271	0.276
B0	10.45	10.5	10.6	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.1			0.004		
10P0	39.8	40	40.2	1.567	1.575	1.583